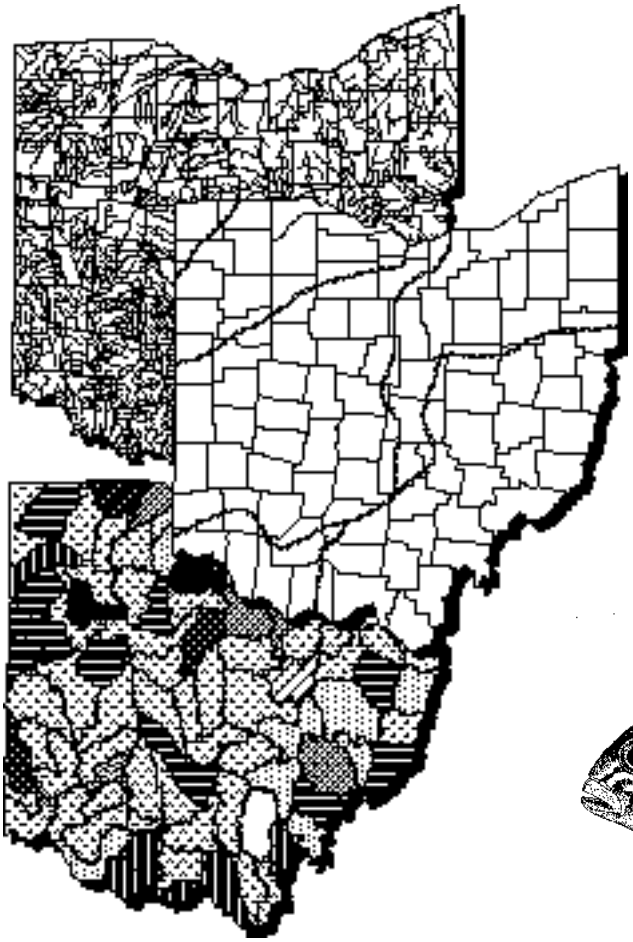
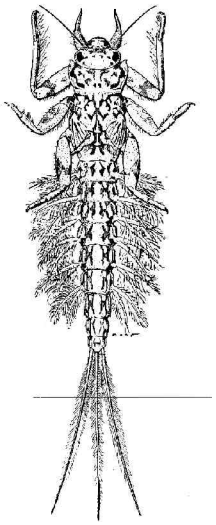
State of Ohio
Environmental Protection Agency

Ecological Assessment Unit
Division of Surface Water

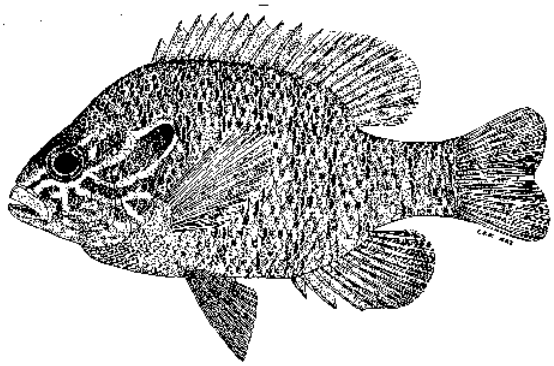
Biological and Water Quality Study of The Upper Scioto River Basin

Delaware, Frankin, Hardin, Marion and Wyandot Counties





Burrowing Mayfly
(*Anthopotamus* sp.)



Longear Sunfish
(*Lepomis megalotis*)

April 2, 1997

P.O. Box 1049, 1800 WaterMark Dr., Columbus, Ohio 43216-1049

Biological and Water Quality Study of the Upper Scioto River Basin

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April 2, 1996

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Number MAS/1996-12-13

prepared by

State of Ohio Environmental Protection Agency
Division of Surface Waters
Ecological Assessment Unit
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NOTICE TO USERS

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) regulations in February 1990 (effective May 1990). These criteria consist of numeric values for the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), both of which are based on fish assemblage data, and the Invertebrate Community Index (ICI), which is based on macroinvertebrate assemblage data. Criteria for each index are specified for each of Ohio's five ecoregions (as described by Omernik 1987), and are further organized by organism group, index, site type, and aquatic life use designation. These criteria, along with the existing chemical and whole effluent toxicity evaluation methods and criteria, figure prominently in the monitoring and assessment of Ohio's surface water resources.

The following documents support the use of biological criteria by outlining the rationale for using biological information, the methods by which the biocriteria were derived and calculated, the field methods by which sampling must be conducted, and the process for evaluating results:

Ohio Environmental Protection Agency. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

Ohio Environmental Protection Agency. 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

Ohio Environmental Protection Agency. 1989b. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Plan. & Assess., Ecological Assessment Section, Columbus, Ohio.

Ohio Environmental Protection Agency. 1989c. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. Water Quality Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Ohio Environmental Protection Agency. 1990. The use of biological criteria in the Ohio EPA surface water monitoring and assessment program. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Since the publication of the preceding guidance documents, the following new publications by the

Ohio EPA have become available. These publications should also be consulted as they represent the latest information and analyses used by the Ohio EPA to implement the biological criteria.

DeShon, J.D. 1995. Development and application of the invertebrate community index (ICI), pp. 217-243. in W.S. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Rankin, E. T. 1995. The use of habitat assessments in water resource management programs, pp. 181-208. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995. Biological criteria program development and implementation in Ohio, pp. 109-144. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995. Biological response signatures and the area of degradation value: new tools for interpreting multimetric data, pp. 263-286. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. 1995. Policy issues and management applications for biological criteria, pp. 327-344. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995. The role of biological criteria in water quality monitoring, assessment, and regulation. Environmental Regulation in Ohio: How to Cope With the Regulatory Jungle. Inst. of Business Law, Santa Monica, CA. 54 pp.

These documents and this report can be obtained by writing to:

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Monitoring and Assessment Section
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FOREWORD

What is a Biological and Water Quality Survey?
A biological and water quality survey, or "biosurvey", is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This effort may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. Each year Ohio EPA conducts biosurveys in 10-15 different study areas with an aggregate total of 250-300 sampling sites.

Ohio EPA employs biological, chemical, and physical monitoring and assessment techniques in biosurveys in order to meet three major objectives: 1) determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained; 2) determine if use designations assigned to a given water body are appropriate and attainable; and 3) determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices. The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. Each biological and water quality study contains a summary of major findings and recommendations for revisions to WQS, future monitoring needs, or other actions which may be needed to resolve existing impairment of designated uses. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns, are also addressed.

The findings and conclusions of a biological and water quality study may factor into regulatory actions taken by Ohio EPA (*e.g.*, NPDES permits, Director's Orders, the Ohio Water Quality Standards [OAC 3745-1]), and are eventually incorporated into Water Quality Permit Support Documents (WQPSDs), State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the Ohio Water Resource Inventory (305[b] report).

Hierarchy of Indicators
A carefully conceived ambient monitoring approach, using cost-effective indicators comprised of

ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. Ohio EPA relies on a tiered approach in attempting to link the results of administrative activities with true environmental measures. This integrated approach is outlined in Figure 1 and includes a hierarchical continuum from administrative to true environmental indicators. The six "levels" of indicators include: 1) actions taken by regulatory agencies (permitting, enforcement, grants); 2) responses by the regulated community (treatment works, pollution prevention); 3) changes in discharged quantities (pollutant loadings); 4) changes in ambient conditions (water quality, habitat); 5) changes in uptake and/or assimilation (tissue contamination, biomarkers, wasteload allocation); and, 6) changes in health, ecology, or other effects (ecological condition, pathogens). In this process the results of administrative activities (levels 1 and 2) can be linked to efforts to improve water quality (levels 3, 4, and 5) which should translate into the environmental "results" (level 6). Thus, the aggregate effect of billions of dollars spent on water pollution control since the early 1970s can now be determined with quantifiable measures of environmental condition. Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators. *Stressor* indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. *Exposure* indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to a stressor or bioaccumulative agent. *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the more direct measures of community and population response that are represented here by the biological indices which comprise Ohio's biological criteria. Other response indicators could include target assemblages, *i.e.*, rare, threatened, endangered, special status, and declining species or bacterial levels which serve as surrogates for the recreational uses. These indicators represent the essential technical elements for watershed-based management approaches. The key, however, is to use the different indicators *within* the roles which are most appropriate for each. Describing the causes and sources associated with observed impairments revealed by the biological criteria and linking this with pollution sources involves an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators. The principal reporting venue for this process on a watershed or subbasin scale is a biological and water quality report. These reports then provide the foundation for aggregated assessments such as the Ohio Water Resource Inventory (305[b] report), the Ohio Nonpoint Source Assessment, and other technical bulletins.

Ohio Water Quality Standards: Designated Aquatic Life Uses

The Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) consist of designated uses and chemical, physical, and biological criteria designed to represent measurable properties of the environment that are consistent with the goals specified by each use designation. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. In applications of the Ohio WQS to the management of water resource issues in Ohio's rivers and streams, the aquatic life use criteria frequently result in the most stringent protection and restoration requirements, hence their emphasis in biological and water quality reports. Also, an emphasis on

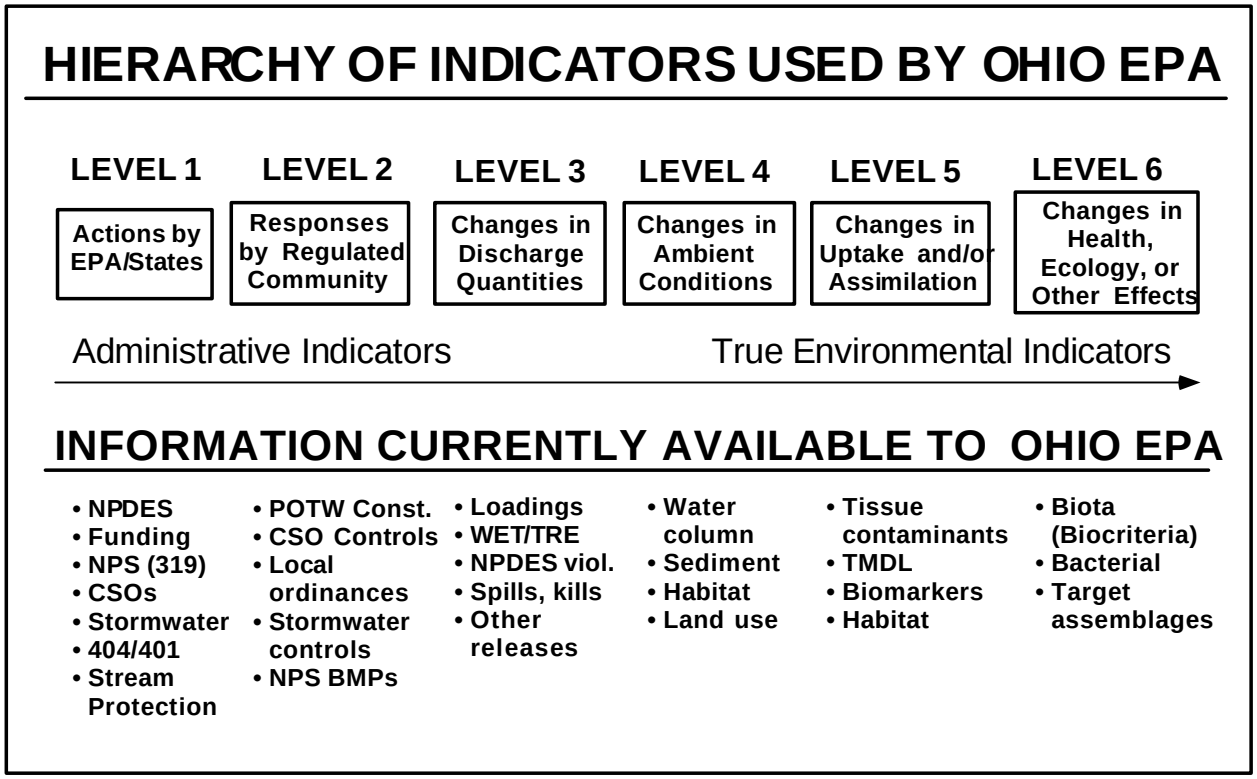


Figure 1. Hierarchy of administrative and environmental indicators used by Ohio EPA for monitoring, assessment, reporting, and evaluating program effectiveness. This is patterned after a model developed by the U.S. EPA, Office of Water.

protecting for aquatic life generally results in water quality suitable for all uses. The five different aquatic life uses currently defined in the Ohio WQS are described as follows:

1) *Warmwater Habitat (WWH)* - this use designation defines the "typical" warmwater assemblage of aquatic organisms for Ohio rivers and streams; *this use represents the principal restoration target for the majority of water resource management efforts in Ohio.*

2) *Exceptional Warmwater Habitat (EWH)* - this use designation is reserved for waters which

support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (*i.e.*, declining species); *this designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources.*

3) *Coldwater Habitat (CWH)* - this use is intended for waters which support assemblages of cold water organisms and/or those which are stocked with salmonids with the intent of providing a put-and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic "runs" of salmonids during the spring, summer, and/or fall.

4) *Modified Warmwater Habitat (MWH)* - this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable *and where the activities have been sanctioned by state or federal law;* the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat.

5) *Limited Resource Water (LRW)* - this use applies to small streams (usually <3 mi.^{2} drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (*i.e.*, true ephemeral streams), or other irretrievably altered waterways.

Chemical, physical, and/or biological criteria are generally assigned to each use designation in accordance with the broad goals defined by each. As such the system of use designations employed in the Ohio WQS constitutes a "tiered" approach in that varying and graduated levels of protection are provided by each. This hierarchy is especially apparent for parameters such as dissolved oxygen, ammonia-nitrogen, temperature, and the biological criteria. For other parameters such as heavy metals, the technology to construct an equally graduated set of criteria has been lacking, thus the same water quality criteria may apply to two or three different use designations.

Ohio Water Quality Standards: Non-Aquatic Life Uses

In addition to assessing the appropriateness and status of aquatic life uses, each biological and water quality survey also addresses non-aquatic life uses such as recreation, water supply, and human health concerns as appropriate. The recreation uses most applicable to rivers and streams are the Primary Contact Recreation (PCR) and Secondary Contact Recreation (SCR) uses. The criterion for designating the PCR use is simply having a water depth of at least one meter over an area of at least 100 square feet or where canoeing is a feasible activity. If a water body is too small

and shallow to meet either criterion the SCR use applies. The attainment status of PCR and SCR is determined using criteria for bacterial indicators (*e.g.*, fecal coliform, *E. coli)* specified in the Ohio WQS.

Water supply uses include Public Water Supply (PWS), Agricultural Water Supply (AWS), and Industrial Water Supply (IWS). Public Water Supplies are simply defined as segments within 500 yards of a potable water supply or food processing industry intake. The Agricultural Water Supply (AWS) and Industrial Water Supply (IWS) use designations generally apply to all waters unless it can be clearly shown that they are not applicable. An example of this would be an urban area where livestock watering or pasturing does not take place, thus the AWS use would not apply. Chemical criteria are specified in the Ohio WQS for each use and attainment status is based primarily on chemical-specific indicators. Human health concerns are additionally addressed with fish tissue data, but any consumption advisories are issued by the Ohio Department of Health and detailed in other documents.

INTRODUCTION

The 1995 Upper Scioto River study area consisted of the Scioto River mainstem from its headwaters near the community of Roundhead (RM 220.8) to downstream from O'Shaughnessy Reservoir near I-270 (RM 145.5), and included the following tributaries: Cottonwood Ditch (confluence with mainstem at RM 221.5), Taylor Creek (RM 213.07), Silver Creek (tributary to Taylor Creek at RM 0.1), Panther Creek (RM 203.6), and Wildcat Creek (RM 199.2) See Table 3 and Figure 2 for a complete list of sampling locations.

Specific objectives of this study were:

1) describe or quantify the physical habitat, surface water and sediment quality, and the biological integrity of the Upper Scioto River Study area,

2) assess potential impacts to water quality and biological integrity associated with the major permitted dischargers Kenton WWTP and Occidental Chemical Corporation,

3) assess potential impacts to water quality and biological integrity associates with the minor dischargers Rockwell International, Alger WWTP, and McGuffey WWTP,

4) evaluate the city of Kenton's CSOs,

5) identify and evaluate non-point sources of pollution, and assess habitat impacts within the jurisdiction of the Upper Scioto Conservancy District,

6) determine attainment status of aquatic life use and non-aquatic use designations, and recommend changes where appropriate, and

7) compare results of this survey with previous surveys to assesses changes in water quality and biological integrity.

The findings of this evaluation may factor into regulatory actions taken by the Ohio EPA (e.g., NPDES permits or Director's Orders), the Ohio Water Quality Standards (OAC 3745-1), and eventually be incorporated into the State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the potential Water Resources Inventory (305[b] report).

SUMMARY

A biological and water quality survey of the Upper Scioto River sub-basin was conducted 15 June - 10 October 1995. Most locations surveyed throughout the basin met the applicable biological criteria and aquatic life use designations (Table 1). Exceptions were the upper 20 miles of the Scioto River mainstem where channelization grossly altered the physical habitat of the river,

downstream from the Kenton WWTP outfall, and downstream from the confluence with the Little Scioto River in the Prospect dam pool. Panther Creek and Wildcat Creek were both impacted by discharge from unsewered communities.

Scioto River

The upper Scioto River mainstem had 55.7 miles in full attainment of the WWH bio-criteria, 19.4 miles in partial attainment and 6.4 miles in **non**-attainment (Figure 2). The principal factor limiting full attainment of aquatic life use designations in the upper reach of the river downstream from the Village of Roundhead (RM 231) to Hepburn (RM 203) was channelization of the entire reach combined with siltation. The Kenton WWTP caused a slight decline in biological community performance immediately downstream from the outfall, and a moderate decline at RM 207.3 coinciding with delayed effects of nutrient enrichment *(i.e.*, diurnal dissolved oxygen variation). Recovery to upstream conditions by RM 203.3. The dam at Prospect, in conjunction with nutrient loadings from the Little Scioto River, severely impacted biotic communities, precluding attainment of numerical bio-criteria. Downstream from Hepburn (RM 203.3), nutrient enrichment from pollutant loadings discharged by the Little Scioto River, the Kenton WWTP, the Occidental Chemical Corporation and the Village of McGuffey WWTP was the primary factor for the observed marginal performance of biological communities. Addtionally, the McGuffey WWTP and the Kenton WWTP had numerous NPDES permit violations for total suspended solids and carbonaceous biochemical oxygen demand, and the Kenton WWTP had eight documented spills of untreated sewage which together contributed to the low dissolved oxygen concentrations measured downstream from Kenton and biological impairment.

Concentrations of phosphorus and inorganic nitrogen in the Scioto River mainstem were highest immediately downstream from the Little Scioto River.

Overall, biological communities have improved in the upper Scioto River mainstem since 1984, due to a combination of reduced pollutant loadings, increasing amounts of agricultural acreage in conservation tillage, and 12 years of additional recovery time since the last whole scale channelization of the mainstem conducted in the early part of this century. In particular, the macroinvertebrate community recovered to exceptional levels throughout much of the mainstem.

Cottonwood Ditch

Cottonwood Ditch was in full attainment of the MWH bio-criteria; however, given the poor habitat and degraded fauna, biological communities did not reflect substantial water quality impacts from the Village of McGuffey WWTP.

Taylor Creek

Biological communities in Taylor Creek met the WWH bio-criteria at all stations sampled, yielding 4.5 miles in full attainment. However, community performance declined downstream from the Occidental Chemical Corporation in response to the effects from nutrient enrichment, especially phosphorus.

Silver Creek
Biological communities were in partial attainment of the WWH bio-criteria in Silver Creek due mostly to intermittent stream flow.

Panther Creek
Unsewered homes adjacent to and upstream from Hale T.R. 197 (RM 8.9) contributed nutrients, but did not significantly impair fish or macroinvertebrates. Unsewered wastewater discharges from the village of Ridgeway impacted water quality and the fish community resulting in partial attainment of the WWH bio-criteria at RM 5.7. Biological communities recovered to full attainment of the bio-criteria by RM 1.8.

Wildcat Creek
Unsewered wastewater discharges in Mt. Victory combined with limited habitat from channelization, resulted in partial attainment of WWH use designation downstream from Mt. Victory. Assimilation of nutrients and improved physical habitat allowed recovery to full attainment at RM 0.5.

RECOMMENDATIONS

Scioto River
Status of Aquatic Life Uses
The Scioto River upstream from O'Shaughnessy Reservoir is designated WWH. Performance of biological indicators and the physical habitat assessment suggest this is an appropriate designation.

Status of Non-aquatic Life Uses
Agricultural and industrial water supply designations, and primary contact recreation designations should be retained.

Other Recommendations
The Scioto River is highly enriched with phosphorus downstream from the confluence with Cottonwood Ditch due to loadings from the McGuffey WWTP, the Occidental Chemical Corporation, and the Kenton WWTP, and becomes enriched with inorganic nitrogen by loadings from the Kenton WWTP and the Marion WWTP (Ohio EPA 1994) via the Little Scioto River. Reduced loadings of phosphorus and nitrogen would improve the biological performance through the reach of good habitat downstream from Hepburn (RM 203.3), including the Prospect Dam pool.

Future Monitoring Concerns
Because the increased amount of agricultural acreage in conservation tillage appears to have substantially improved the performance of the biological indicators, this aspect needs to be better quantified, documented and presented to the agricultural community.

Cottonwood Ditch

Status of Aquatic Life Uses

Cottonwood Ditch is designated MWH through the reach sampled. The designation is appropriate given the channel maintenance activities, and poor habitat and biological indicator scores.

Status of Non-aquatic Life Uses

Agricultural and industrial water supply designations, and primary contact recreation designations should be retained.

Other Recommendations

Because the poor physical habitat in Cottonwood Ditch facilitates the downstream transport of silt, thereby exacerbating phosphorus loadings to the Scioto mainstem, allowing some recovery of the riparian vegetation and free flowing characteristics of the stream would help assimilate nutrients and minimize downstream transport.

Future Monitoring Concerns

Continued monitoring of nutrient loads delivered to the Scioto River mainstem is warranted.

Silver Creek

Status of Aquatic Life Uses

Silver Creek is designated WWH. Although the macroinvertebrate community did not meet expectations for WWH due to intermittent flows, the fish community did, and the presence of good instream physical habitat suggest that the current designation is correct.

Status of Non-aquatic Life Uses

The agricultural and industrial water supply, and primary contact recreation designations are all appropriate.

Other Recommendations

Future Monitoring Concerns

Silver Creek contains a regional reference site sampling location. Continued monitoring is necessary to calibrate biological indices to ambient conditions, and the establishment of long term trends.

Taylor Creek

Status of Aquatic Life Uses

Taylor Creek is designated WWH. Fish and macroinvertebrate communities attained numerical bio-criteria at all sampling locations indicating the designation is appropriate.

Status of Non-aquatic Life Uses

The agricultural and industrial water supply designations, and primary contact recreation

designations are all appropriate.

Other Recommendations
Occidental Chemical Corporation is responsible for extremely elevated levels of phosphorus in Taylor Creek. Reductions in phosphorus loadings are recommended to improve water quality in both Taylor Creek and the Scioto River mainstem. Because the Occidental Chemical Corporation loads significant amounts of phosphorus to the Scioto River via Taylor Creek, monitoring for phosphorus should be required in their discharge permit(s).

Future Monitoring Concerns
As chronic and acute toxicity to the Occidental effluent has been documented, continued periodic bioassays are warranted. Also, because significant sediment contamination was observed in the sample collected downstream from the Occidental Chemical Corporation (RM 1.94), and due to the presence of a strong odor and tentatively identified semi-volatile orgainc compounds, analysis of volatile organic compounds should be performed at this station.

Panther Creek
Status of Aquatic Life Uses
Panther Creek is designated WWH. Performance of biological communities and the presence of good to excellent habitat warrant this designation.

Status of Non-aquatic Life Uses
Agricultural and industrial water supply designations, and primary contact recreation designations are all appropriate.

Other Recommendations
Unsewered discharges by the village of Ridgeway is impairing aquatic life use attainment in Panther Creek. Identification and remediation of failing septic beds are needed to correct the problem.

Future Monitoring Concerns
Continued or increasing water quality impairment to Panther Creek by the Village of Ridgeway may warrant a centralized sewerage system. After the village of Mt. Victory WWTP is brought online, pollutant loadings, instream water quality and aquatic communities will need to be monitored.

Wildcat Creek
Status of Aquatic Life Uses
Wildcat Creek is designated WWH. Biological communities fully or partial met the WWH headwaters bio-criteria despite marginal habitat, suggesting that the use designation is appropriate.

Status of Non-aquatic Life Uses

The agricultural and industrial water supply designations, and primary contact recreation designations are all fitting.

Other Recommendations

Poor physical habitat contributed to the marginal performance of biological communities in Wildcat Creek. Reestablishment of riparian habitat and recovery of a more free-flowing character would help improve the aquatic communities.

Future Monitoring Concerns

With the elimination of unsewered discharges by the Village of Mt. Victory, water quality should improve. This needs to be documented.

STUDY AREA

The Scioto River Basin is the third largest watershed in Ohio and a major tributary of the Ohio River with a drainage area of 6517 square miles. The river is over 230 miles long and has an average gradient of 2.3 feet per mile (ODNR, 1967). The 1995 study area included the upper Scioto River between the Auglaize-Hardin County line to downstream from O'Shaughnessy Reservoir. The river flows through the City of Kenton and predominantly agricultural areas and rural communities of Hardin, Marion and Delaware counties. Tributaries included in the study were Silver Creek, Taylor Creek, Cottonwood Ditch, Panther Creek, and Wildcat Creek. A map of the study area is shown in Figure 2. A list of specific sampling locations is listed in Table 3.

The Upper Scioto watershed lies in the Eastern Corn Belt Plain ecoregion. The study area is gently rolling to nearly flat due to glacial activity during the Wisconsin Ice Age. The bedrock geology of this part of the watershed consists primarily of dolomites and limestones and is a good source of water. Soil types in the study area fall into two categories based on glacial activity. In the upland areas of Hardin and Marion counties, soils formed on the glacial till plains are predominantly in the Blount-Pewamo and Blount-Glynwood associations. These soils are level to gently sloping, light colored, poorly drained and fertile. In Hardin County the Roundhead - McGuffey soils were formed on the broad flats of glacial lake plains. The soil is characterized as a dark colored, poorly drained and highly fertile "muck" that is subject to wind erosion. The muck soils are found in the Scioto Marsh area along the mainstem of the Scioto River and Cottonwood Ditch in western Hardin County. Similar lake plain soils of the Milford-Del Rey-Shinrock association are found in Marion County north of the river.

An interesting historical feature in the Upper Scioto watershed is the Scioto Marsh area which borders the Scioto River near the Village of McGuffey. A 1989 Ohio Historical Marker sign along the river on the west side of State Route 195 reads:

"Scioto Marsh, the largest of three extensive marsh areas in western Hardin County, was formed in low basins left by the last retreating glacier 10,000 years ago. It covered more than 16,000 acres and was thought to be a source of malaria by the early settlers. A drainage project was begun in 1859, and the remaining peat-ladened soil helped make this a rich agricultural area."

Table 1. Aquatic life use attainment status for stations sampled in the upper Scioto River basin based on data collected June-September, 1995. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores base on the performance of the biotic community. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat to support a biotic community.

River Mile Fish/Invertebrate	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status[c]	Comment
Scioto River			*WWH existing*			
233.6[D]/234.3	35*	7.3*	50	50	PARTIAL	Ust conditions, NPS
231.7[D]/231.8	37[ns]	7.3*	50	66	PARTIAL	Dst Roundhead, NPS
226.3[D]/ --	38[ns]	8.1[ns]	NA	23	(FULL)	Riparian removal
221.9[D]/222.8	35*	7.7*	56	44	PARTIAL	Ust Cottonwood Ditch
220.8[D]/220.8	33*	6.6*	50	25	PARTIAL	Dst Cotton.(McGuffey WWTP)
216.2[D]/216.6	45	8.6	56	42	FULL	Good habitat (per study plan)
213.9[D]/213.9	43	7.7*	48	32	PARTIAL	Ust Taylor Creek
212.8[D]/212.8	45	8.3	50	37	FULL	Ust 1st CSO
211.5[D]/211.5	40	8.0	46	52	FULL	Dst CSOs, ust Kenton WWTP
211.35[D]/211.39	*41*	*9.2*	*Fair**		NA	Kenton WWPT mix zone
211.2[D]/211.3	43	7.6*	36	41	PARTIAL	Dst Kenton WWTP
210.1[D]/210.1	43	9.1	44	51	FULL	Dst Kenton WWTP
207.3[D]/207.7	38[ns]	8.2[ns]	48	58	FULL	Impact/Recovery
203.3[A]/201.3	44	9.7	48	78	FULL	Reference site
192.2[A]/192.2	38[ns]	8.9	46	61	FULL	Dst LaRue chicken farms
178.5[A]/179.6	38[ns]	8.5	44	70	FULL	Ust Green Camp
178.5[De]/ --	40[ns]	9.1	44	70	FULL	
175.7[A]/177.2	27*	5.4*	20*	49	NON	Dst Green Camp, L. Scioto R.
169.4[A]/169.2	39[ns]	9.2	50	64	FULL	Dst Prospect
160.5[A]/160.5	43	9.3	48	89	FULL	Ust O'Shaughnessy Res.
145.7[A]/145.8	41[ns]	9.1	38	88	FULL	Dst O'Shaughnessy Res.
Cottonwood Ditch			*MWH existing*			
2.4/2.5	31	NA	28	26	FULL	Ust McGuffey WWTP
0.8/0.7	31	NA	28	30	FULL	Dst McGuffey WWTP
Taylor Creek			*WWH existing*			
4.5/4.5	42	NA	56	78	FULL	Ust conditions
2.1/ --	*44*	*NA*	*Good*	*NA*	*NA*	Occidental Chem. mix zone

Table 1. Continued.

River Mile Fish/Invertebrate	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status[c]	Comment
Taylor Creek - continued						
2.0/2.0	39	NA	50	56	FULL	Dst Occidental Chem.
0.8/0.7	42	NA	34[ns]	47	FULL	Dst Rockwell International
Silver Creek			*WWH existing*			
2.4/2.3	40	NA	F	65	PARTIAL	Reference
Panther Creek			*WWH existing*			
9.0/8.9	37[ns]	NA	G	67	FULL	NPS
5.7/5.7	28*	NA	G	74	PARTIAL	NPS
1.9/1.8	42	NA	MG	81	FULL	NPS
Wildcat Creek			*WWH existing*			
6.8/6.7	37[ns]	NA	F	28	PARTIAL	NPS
0.6/0.5	38[ns]	7.8[ns]	36	50	FULL	NPS

Ecoregion Biobio-criteria: Eastern Cornbelt Plain

	IBI			MIwb			ICI		
Site Type	WWH	EWH	MWH[d]	WWH	EWH	MWH[d]	WWH	EWH	MWH[d]
Headwaters	40	50	24				36	46	22
Wading	40	50	24	8.3	9.4	5.8	36	46	22
Boat	42	48	24	8.5	9.6	6.2	36	46	22

a - MIwb is not applicable (NA) to headwater streams with drainage area ≤20mi^2.
b - The narrative evaluation based on the qualitative collection is used in lieu of the numeric score when an ICI score is not available.
c - Attainment status based on one organism group is expressed parenthetically.
D - Wading method used.
A - Boat method used.
* - Indicates significant departure from applicable bio-criteria (>4 IBI or ICI units or >0.5 MIwb units). Underlined scores are in the Poor to Very Poor range.
ns - Nonsignificant departure from bio-criteria (≤4 IBI or ICI units or ≤0.5 MIwb units).
d - Modified warmwater habitat for channel modified habitats.
e - Low flows precluded use of boat method on the second pass.

Table 2. Existing and recommended waterbody use designations for stream segments sampled in the 1995 Upper Scioto River Basin survey, including streams in the vicinity of the AgriGeneral egg farms. Changes to existing use designations appear in ***bold italics***, or designations based on the 1978 water quality standards for which results of biological field assessments are now available appear as triangles to the right of existing markers.

Stream Segment	**Use Designations**												
		Aquatic Life Habitat						**Water Supply**			**Recreation**		
	SRW	**WWH**	**EWH**	**MWW**	**SSH**	**CWH**	**LRW**	**PWS**	**AWS**	**IWS**	**BW**	**PCR**	**SCR**
Scioto River - O'Shaughnessy dam (RM 148.8) to the Dublin Road WTP dam (RM 133.4)	+	+						+	+	+		+	
-headwaters to O'Shaughnessy dam		*/+						*	*			*	
McDonald Creek		*						*	*			*	
Wildcat Creek		*/+						*	*			*	
Panther Creek		*/+						*	*			*	
Taylor Creek		*/+						*	*			*	
Silver Creek		*/+						*	*			*	
Cottonwood Ditch - Hardin County Road 35 (RM 4.5) to the mouth				+				*	*			*	
- all other segments		*						*	*			*	
Tymochtee Creek		*						*	*			*	
Blood Run													
PawPaw Run		*						*	*			*	
Enoch Creek		*						*	*			*	

Stream Segment	Use Designations												
		Aquatic Life Habitat						Water Supply			Recreation		
	SRW	WWH	EWH	MWW	SSH	CWH	LRW	PWS	AWS	IWS	BW	PCR	SCR
Prairie Run		*						*	*			*	
Little Sandusky River		*						*	*			*	
Unnamed Trib													

The Upper Scioto watershed is largely rural. Kenton is the largest urban area and there are eight smaller villages located in the study area. Land use is primarily dedicated to agricultural activities with approximately 60-70% of land in Hardin and Marion counties being used for crop production, 12-16% is pasture, 13-17% is forested, and less than 6% is for urban and other land uses (Ohio EPA, 1986).

Nonpoint sources of impairment in the Scioto River and its tributaries include general agricultural runoff from crop production and livestock operations, streambank modification, dredging, and channelization (Ohio EPA, 1994). It was noted during the survey that livestock from Amish farms on Panther Creek and Wildcat Creek have access to the stream and the banks are eroded at these crossing/watering areas.

Information was obtained from the Hardin County Engineer's Office and the Upper Scioto Conservancy District about stream maintenance activities in the watershed. The County Engineer maintains sections of Wildcat Creek, Silver Creek, and Panther Creek including mowing, spraying, one sided bank reconstruction (with tree removal), and bottom dipping. The Conservancy District has maintenance responsibility for the Scioto River corridor and Cottonwood Ditch, with the engineering work being provided by the Natural Resources Conservation Service. Maintenance activities include a spray program in Kenton, one sided bank reconstruction, and small log jam removal. Taylor Creek is not maintained.

Conservation tillage practices in farming have increased over the last ten years as indicated by the 1995 Hardin County tillage transect survey of the Upper Scioto watershed. More than half of the grain crops were planted in no-till or mulch till with greater than 30% residue (45% corn, 62% soybean, 87% fall small grains). Soybean and wheat conservation tillage acres have increased significantly in recent years due to strong conservation programs in the county. Hardin Soil and Water Conservation District (SWCD) has a windbreak program that has been very well received and

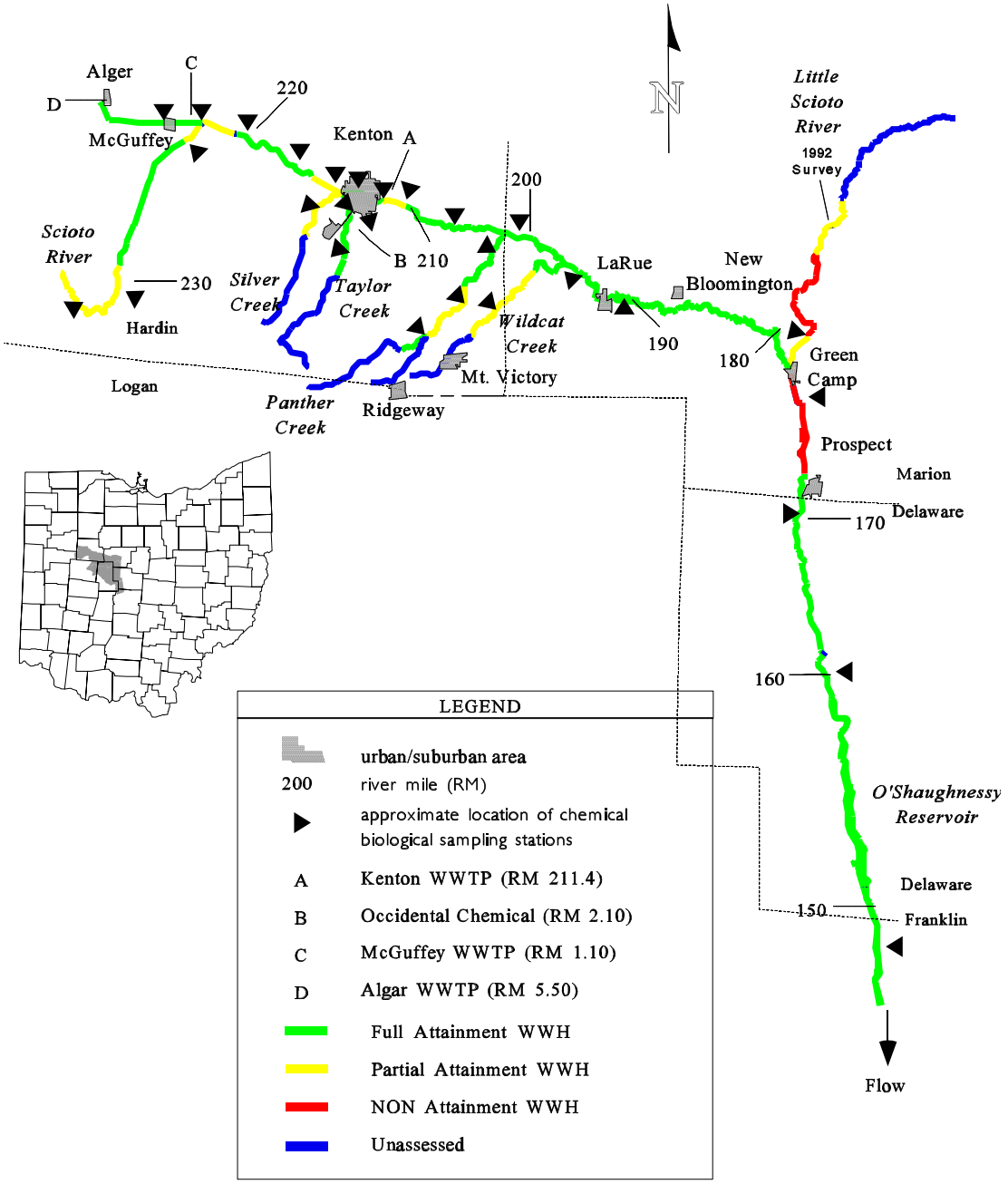


Figure 2. Upper Scioto River study area showing approximate sampling locations, municipalities, point-source dischargers, and color coded attainment status.

Table 3. Sampling locations in Upper Scioto River basin, 1995 (C - conventional water chemistry ; C_{sm} - sediment metals; C_{so} - sediment organics; B - benthic macroinvertebrates, F - fish).

Stream/ River Mile	Type of Sampling	Latitude/Longitude	Landmark	USGS 7.5 Minute Quadrangle Map
Scioto River				
234.3	B,C	403317/835138	Arborgast Rd.	Roundhead
233.6	F	403312/835102	Farm lane off SR 385	Roundhead
231.8	B,C	403340/834957	Dst Madory Rd.	Roundhead
231.7	F	403344/834946	Dst Madory Rd.	Roundhead
226.3	F	403809/834828	Ust CR 130	Alger
222.8	B,C	404036/834617	Ust Cottonwood Ditch	Alger
221.9	F	404106/834536	Ust Cottonwood Ditch	Alger
220.8	F,B,C	404116/834435	Dst Cottonwood Ditch	Foraker
216.6	B,C	404005/834036	Rodger Rd. (CR 106)	Foraker
216.2	F	403943/834031	Ust TR 125	Foraker
213.9	B,$C_{SM,SO}$,F	403849/833817	CR 130	Foraker
212.8	B,$C_{SM,SO}$,F	403839/833711	Dst Taylor Cr.	Kenton
211.5	B,$C_{SM,SO}$,F	403822/833610	Ust Kenton WWTP	Kenton
211.39	B,C,F	403812/833551	WWTP mix zone	Kenton
211.3	B,$C_{SM,SO}$	403812/833544	Dst Kenton WWTP	Kenton
211.2	F	403813/833525	Dst Kenton WWTP	Kenton
210.1	B,C,F	403813/833428	CR 175	Kenton
207.7	B,$C_{SM,SO}$	403724/833217	CR 195	Mt.Victory
207.3	F	403721/833152	TR 199	Mt.Victory
203.3	F	403702/832813	Dst CR 227	LaRue
201.3	B,C	403632/832624	TR 245	LaRue
192.2	F,B,C	403422/832100	Schotte Rd.	New Bloomington
179.6	B,C	403249/831312	Ust Green Camp	Marion West
178.5	F	404234/831258	Ust Green Camp	Marion West
177.2	B,C	403113/801219	Dst L. Scioto R.	Marion West
175.7	F	402959/831150	Dst L. Scioto R.	Prospect
169.4	F	402512/831139	Ust Hoskins Rd	Prospect
169.2	B,C	402510/831150	Hoskins Rd	Ostrander
160.5	F,B,C	401827/831004	Ust Warrensburg	Ostrander
145.8	B,C	400649/830645	Ust I-270	NW Columbus
145.7	F	400647/830648	Ust I-270	NW Columbus
Cottonwood Ditch				
2.5	B	404121/834817	Ust McGuffey	Alger

Table 3. Continued.

Stream/ River Mile	Type of Sampling	Latitude/Longitude	Landmark	USGS 7.5 Minute Quadrangle Map
Cottonwood Ditch - continued.				
2.4	F	404121/834813	Ust McGuffey	Alger
0.8	F	404121/834536	Dst McGuffey WWTP	Alger
0.7	B	404121/834609	Dst McGuffey WWTP	Alger
Taylor Creek				
4.5	B,$C_{SM,SO}$,F	403538/833717	T 180	Mt.Victory
2.1	B,C,F	403721/833707	Occidental mix zone	Mt.Victory
2.0	B,F	403726/833703	Dst Occidentla Chem.	Mt.Victory
0.8	F	403814/833703	Ust SR 67	Mt.Victory
0.7	B,$C_{SM,SO}$	403818/833703	SR 67	Mt.Victory
Silver Creek				
2.4	C_{SM},F	403724/833857	Ust SR 67	Silver Creek
2.3	B	403729/833857	SR 67	Silver Creek
Panther Creek				
9.0	F	403226/833243	T 197	Mt.Victory
8.9	B,C	403227/833238	T 197	Mt.Victory
5.7	B,C,F	403351/833043	CR 200	Mt.Victory
1.9	F	403559/832901	CR 219	LaRue
1.8	B,C	403559/832859	CR 219	LaRue
Wildcat Creek				
6.8	F	403313/832912	T 217	LaRue
6.7	B	403317/832907	T 217	LaRue
0.6	F	403532/832524	LaRue-Kenton Rd.	LaRue
0.5	B	403532/832525	LaRue-Kenton Rd.	LaRue

is addressing wind erosion in the Scioto Marsh area. In 1996 the Hardin SWCD introduced the Scioto River Watershed Filter Strip Program. Financial incentives are offered to landowners to install and maintain grass or tree filter strips on cropland and pastures adjacent to streams in the Scioto watershed.

The Scioto River, Silver Creek, Taylor Creek, Panther Creek, and Wildcat Creek all have an aquatic life use designation of Warmwater Habitat. Cottonwood Ditch from Hardin County Road 35 (RM 4.5) to the mouth is designated Modified Warmwater Habitat due to extensive channel modification. The Village of McGuffey Wastewater Treatment Plant has been granted an economic variance from dissolved oxygen and ammonia criteria. All stream segments in the study area are also designated Agricultural and Industrial Water Supply, with a recreational use designation of Primary Contact Recreation.

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. Chemical, physical and biological sampling locations are listed in Table 3.

Determining UseAttainment Status

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 7-17). 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. Numerical endpoints are stratified by ecoregion, use designation, and stream or river size. 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 criteria. Non-attainment means that none of the applicable indices meet the criteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table (see 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 comments and observations for each sampling location.

The attainment status of aquatic life uses (*i.e.*, full, partial, and non-attainment) is determined by using the biological criteria codified in the Ohio Water Quality Standards (WQS; Ohio Administrative Code [OAC] 3745-1-07, Table 7-17). The biological community performance measures used include the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics. The IBI and ICI are multimetric indices patterned after an original IBI described by Karr (1981) and Fausch *et al*. (1984). The ICI was developed by Ohio EPA (1987b) and further described by DeShon (1995). The MIwb is a measure of fish community abundance and diversity using numbers and weight information and is a modification of the original Index of Well-Being originally applied to fish community information from the Wabash River (Gammon 1976; Gammon *et al*. 1981).

Performance expectations for the principal aquatic life uses in the Ohio WQS (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH]) were developed using the regional reference site approach (Hughes *et al*. 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of the aquatic life use is full if all three indices (or those available) meet the applicable criteria, partial if at least one of the indices does not attain and performance is fair, and non-attainment if all indices fail to attain or any index indicates poor or very poor performance. Partial and non-attainment indicate that the receiving water is impaired and does not meet the designated use criteria specified by the Ohio WQS.

Habitat Assessment

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 bio-criteria. Scores greater than 75 frequently typify habitat conditions which have the ability to support exceptional warmwater faunas.

Macroinvertebrate Community Assessment

Macroinvertebrates were sampled quantitatively using multiple-plate, artificial substrate samplers (modified Hester/Dendy) in conjunction with a qualitative assessment of the available natural

substrates. Artificial substrates were colonized for a six week period and the qualitative sample was collected at the time of artificial substrate retrieval. Mixing zones were qualitatively sampled once or twice during the six week period; no artifical substrates were collected at the mixing zone locations.

Fish Community Assessment

Fish were sampled using wading or boat method pulsed DC electrofishing gear. The wading method was used at a frequency of one or two samples at each site. The boat method was used at a frequency of three samples at each site except at RM 178.5 of the Scioto River where the boat method was used on the first two passes, and followed with the wading method on the third pass due to low flows.

Area of Degradation Value (ADV)

An Area Of Degradation Value (ADV; Rankin and Yoder 1991; Yoder and Rankin 1995) was calculated for the study area based on the longitudinal performance of the biological community indices. The ADV portrays the length or "extent" of degradation to aquatic communities and is simply the distance that the biological index (IBI, MIwb, or ICI) departs from the applicable biocriterion or the upstream level of performance (Figure 1). The “magnitude” of impact refers to the vertical departure of each index below the biocriterion or the upstream level of performance. The total ADV is represented by the area beneath the biocriterion (or upstream level) when the results for each index are plotted against river mile. The results are expressed as ADV/mile to normalize comparisons between segments, sampling years, and other streams and rivers.

Causal Associations

Using the results, conclusions, and recommendations of this report requires an understanding of the methodology used to determine the use attainment status and assigning probable causes and sources of impairment. The identification of impairment in rivers and streams is straightforward - the numerical biological criteria are used to judge aquatic life use attainment and impairment (partial and non-attainment). The rationale for using the biological criteria, within a weight of evidence framework, has been extensively discussed elsewhere (Karr *et al*. 1986; Karr 1991; Ohio EPA 1987a,b; Yoder 1989; Miner and Borton 1991; Yoder 1991; Yoder 1995). Describing the causes and sources associated with observed impairments relies on an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, land use data, and biological results (Yoder and Rankin 1995). Thus the assignment of principal causes and sources of impairment in this report represent the association of impairments (based on response indicators) with stressor and exposure indicators. The reliability of the identification of probable causes and sources is increased where many such prior associations have been identified, and have been experimentally or statistically linked together. The ultimate measure of success in water resource management is the restoration of lost or damaged ecosystem attributes including aquatic community structure and function. While there have been criticisms of misapplying the metaphor of ecosystem “health” compared to human patient “health” (Suter 1993) we are here referring to the process for evaluating biological integrity and causes or sources associated with

observed impairments, not whether human health and ecosystem health are analogous concepts.

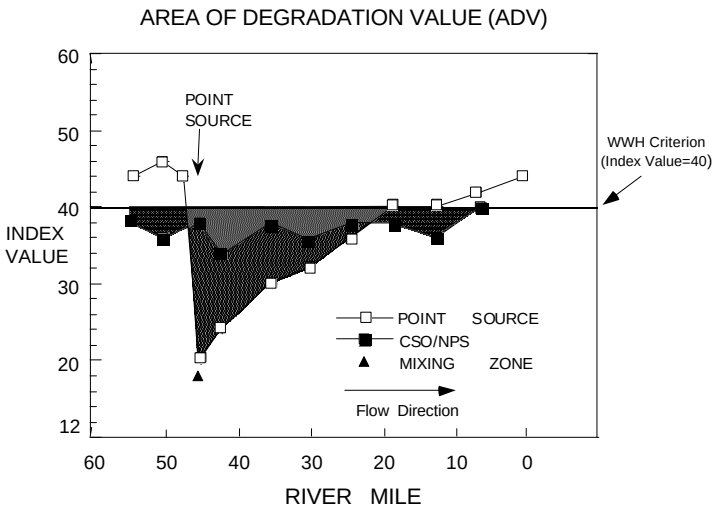


Figure 3. Graphic illustration of the Area of Degradation Value (ADV) based on the ecoregion biocriterion (WWH in this example). the index value trend line indicated by the unfilled boxes and solid shading (area of departure) represents a typical response to a point source impact (mixing zone appears as a solid triangle); the filled boxes and dashed shading (area of departure) represent a typical response to a nonpoint source or combined sewer overflow impact. The blended shading represents the overlapping impact of the point and nonpoint sources.

Results and Discussion

Pollutant Loadings

National Pollutant Discharge Elimination System (NPDES) Permitted Facilities
Several municipal and industrial facilities located in the Scioto River study area are regulated under the NPDES permit system. A summary of these facilities is presented in Table 4.

Table 4. NPDES permitted dischargers to the Scioto River study area.

Entity	Ohio Permit#	Receiving Stream	RM	Process Type
Village of Alger	2PB00064	Unnamed Tributary to Cottonwood Ditch	5.50	Lagoon Sanitary Wastewater Treatment
Village of McGuffey	2PA00006	Cottonwood Ditch	1.10	Mechanical Sanitary Wastewater Treatment
Reed Road Subdivision	2PG00004	Scioto River	230.75	Package Sanitary Wastewater Treatment
Hardin County Home	2PG00079	Scioto River	214.00	Package Sanitary Wastewater Treatment
Occidental Chemical Corp.	2IF00002	Taylor Creek	2.10	Sanitary and Process Wastewater Treatment
City of Kenton	2PD00020	Scioto River	211.40	Mechanical Sanitary Wastewater Treatment
Fairwayview Subdivision	2PG00012	Unnamed Tributary to Scioto River	209.90	Package Sanitary Wastewater Treatment

Table 4. Continued

Entity	Ohio Permit#	Receiving Stream	RM	Process Type
Eldridge Station Hills Estates Subdivision	2PG00005	Scioto River	205.00	Package Sanitary Wastewater Treatment
Indian Trails Mobile Home Park	2PY00016	Unnamed Tributary to Scioto River	187.30	Package Sanitary Wastewater Treatment
Village of Prospect	2PA00041	Scioto River	170.93	Mechanical Sanitary Wastewater Treatment

Village of Alger WWTP

The Village of Alger Wastewater Treatment Plant (WWTP), NPDES permit number 2PB00064, is located on State Route (S.R.) 235, Alger, OH 45812. The current permit became effective on 1 August 1993 and expires on 28 July 1998. The treatment system used at this facility includes a raw pump station, bar screen, two aerated lagoon cells, polishing lagoon, and chlorination. The facility went on-line in 1984 and has 100 percent separate sewers in the collection system with no bypasses or overflows. The design capacity of the facility is 0.15 million gallons per day (MGD), while the hydraulic capacity is 0.375 MGD. Mean annual discharge for the period of record has averaged 0.105 MGD, however mean annual discharge has exceeded design capacity in six of eleven years, including 1993 through 1995 (Figure 4). Final effluent discharges to an unnamed tributary which flows into Cottonwood Ditch at river mile (RM) 5.50.

Trends in loadings of suspended solids (TSS) and ammonia nitrogen (NH_3-N) roughly parallel mean annual discharge (Figure 4). Variation between median and 95th percentile loadings of TSS and NH_3-N increased in years when mean discharge exceeded the design capacity. Pollutant loadings of 5-day carbonaceous biochemical oxygen demand ($cBOD_5$) have remained relatively constant since the facility went on-line in 1984 (Figure 4).

NPDES permit violations documented from October 1994-September 1995 are given in Table 5. Several TSS violations were documented, although none were during the study period. The cause of TSS violations is suspected to be the result of excessive algae discharging from the final effluent. Numerous dissolved oxygen (D.O.) violations occured prior to the replacement of primary lagoon aerators in August 1992.

Village of McGuffey WWTP

The Village of McGuffey WWTP, NPDES permit number 2PA00006, is located on East St., McGuffey, OH 45859. A new facility was constructed and went on-line in June 1992.

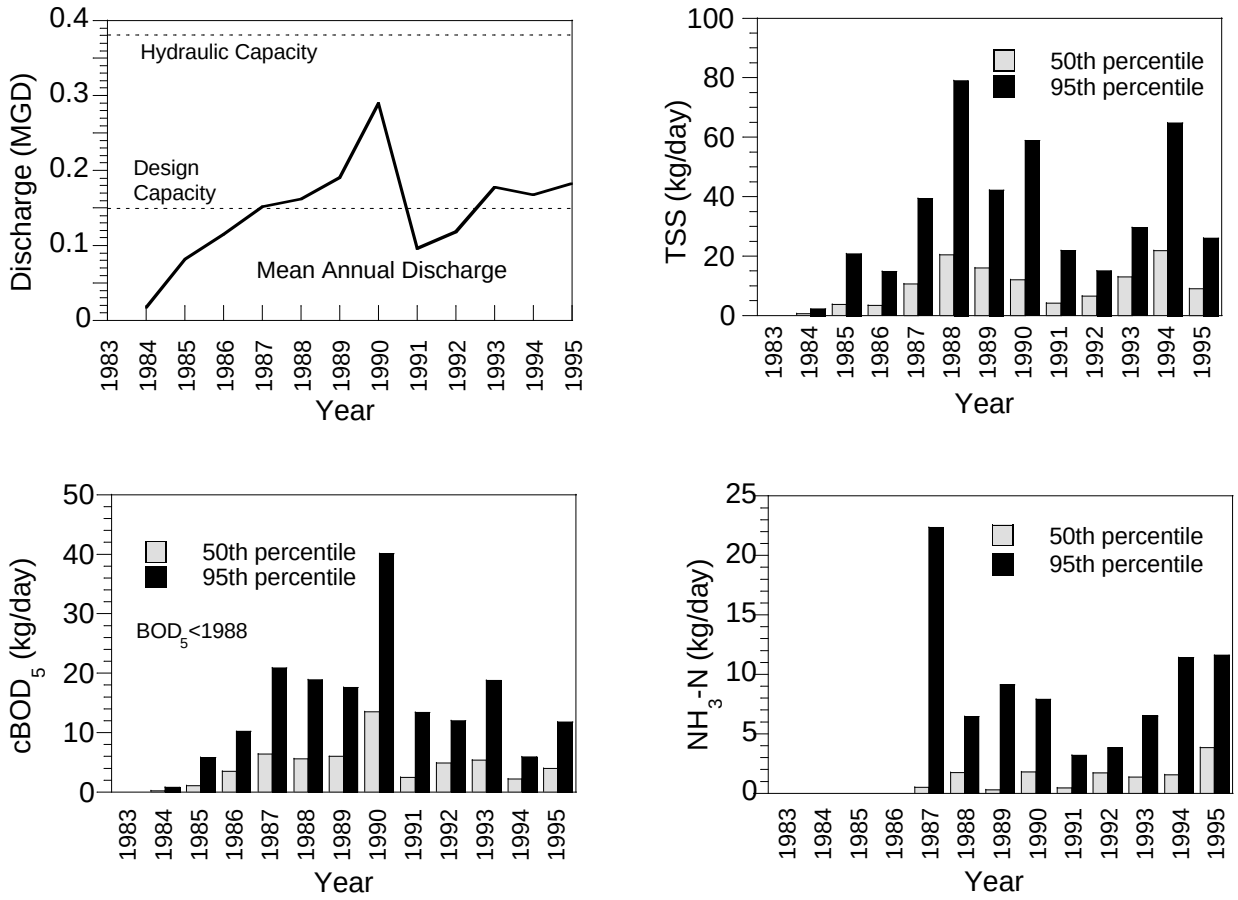
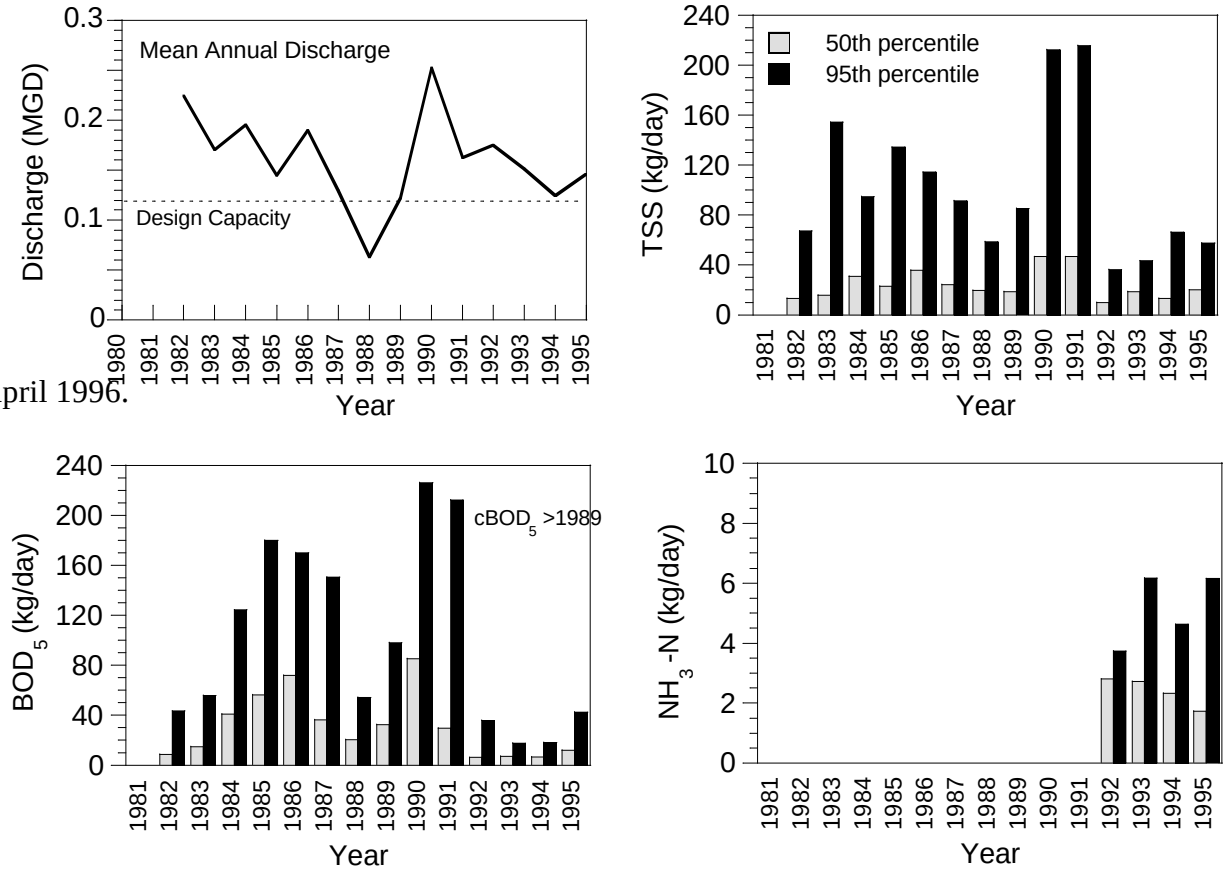


Figure 4. Clockwise from top left; average annual discharge, and median and 95th percentile loadings of total suspended solids, 5-day carbonaceous oxygen demand and ammonia-nitrogen by the village of Alger WWTP 1984-1995.

The treatment system includes a single loop reactor oxidation ditch with an in-channel clarifier, aerobic digester, and chlorination. It was upgraded from an Imhoff Tank that was originally constructed in 1930 and has 100 percent separate sewers in the collection system with no bypasses or overflows. The design and hydraulic capacity of the facility is 0.12 MGD, however mean annual discharge has averaged 0.16 MGD (Figure 5). Final effluent discharges to Cottonwood Ditch at RM 1.10. The current permit became effective on 1 November 1992 and expired on 5 April 1993. Due to numerous NPDES permit violations, the Village of McGuffey entered into a Consent Order with the State of Ohio on 7 March 1990. This order required the village to attain final effluent limits by 15 April 1993. However, the facility continues to be regulated by interim final effluent limits contained in an economic variance, which was renewed on 21 May 1993 and expires on 5



April 1996.

Figure 5. Clockwise from top left: mean annual discharge, and median and 95th percent ile annual loadings of total suspended solids, 5-day biochemical oxygen demand and ammonia - nitrogen to Cottonwood Ditch by the Village of McGuffey WWTP, 1982 - 1995.

NPDES permit violations documented from October 1994-September 1995 are listed in Table 5. Numerous violations of D.O., TSS, $cBOD_5$, fecal coliform, and total residual chlorine (TRC) were documented. The oxidation ditch facility has operated below design c riteria since it went on-line. Excessive infiltration and inflow into the collection system and sludge not returning to th e oxidation ditch are the suspected causes of permit violations.

Table 5. Summary of NPDES permit violations at the Village of Alger and McGuffey WWTPs from October 1994-September 1995. Violations are summarized for monthly concentration minimum (MCMN), monthly concentration average (MCAV), monthly concentration maximum (MCMX), monthly average loading (MQAV), and monthly maximum loading (MQMX).

		Number and Type of Violation				
Date	Parameter	MCMN	MCAV	MCMX	MQAV	MQMX
Alger WWTP						
10-94	TSS		1	1	1	
11-94	TSS		1		1	
	Dissolved Oxygen	2				
12-94	TSS			1		1
03-95	TSS			1	1	
McGuffey WWTP						
10-94	Dissolved Oxygen	11				
	TSS		1	2		
	Fecal Coliform		1	3		
11-94	Dissolved Oxygen	2				
	TSS		1	1	1	1
12-94	TSS		1	2	1	1
01-95	TSS		1	1	1	2
	$cBOD_5$		1	2	1	3
02-95	TSS		1	1	1	3
	$cBOD_5$		1	2	1	3
03-95	TSS		1	1	1	3
	$cBOD_5$		1	1	1	1
04-95	TSS		1	2	1	3
	$cBOD_5$		1	1	1	4

Table 5. Continued

		Number and Type of Violation				
Date	Parameter	MCMN	MCAV	MCMX	MQAV	MQMX
05-95	TSS		1	2	1	3
	$cBOD_5$		1		1	
	Fecal Coliform		1	3		
	Residual Chlorine			10		
06-95	TSS		1	3	1	1
	Fecal Coliform		1	4		
	Residual Chlorine			13		
07-95	Dissolved Oxygen	7				
	TSS		1	1		
	Fecal Coliform		1	3		
	Residual Chlorine			1		
08-95	Dissolved Oxygen	16				
	Fecal Coliform		1	3		
	Residual Chlorine			2		
09-95	Dissolved Oxygen	14				
	Fecal Coliform		1	4		

Occidental Chemical Corporation

Occidental Chemical Corp., NPDES permit number 2IF00002, is located at 13717 S.R 68 South, Kenton, OH 43326. The current permit became effective on 1 November, 1993 and expires on 1 October, 1997. Occidental Chemical manufactures phenolic-based molding compounds and resins used in a variety of industrial and commercial applications ranging from automotive brake pistons to frying pan handles. Phenolic resins are formed as the result of a condensation reaction which takes place in a batch reactor. Raw materials used in the production process are phenol and formaldehyde, which are reacted together in the presence of an acid catalyst. After the reaction, the resulting product (resin) is further processed by vacuum distillation. Resin from the batch reactors is passed through flaking rolls where it is reduced in size. The product is packaged in bags, drums, and boxes. A small portion is dissolved and shipped as liquid in tank trucks. The facility uses some of the resin to produce molding compounds by mixing resin, wood flour, dyes or pigments, and various fillers in a ribbon blender. A heated rolling operation produces sheets of

materials. These sheets are further processed into saleable products by cooling, grinding, screening, blending, and packaging. Wastewater streams include sanitary, process (including processed and/or unprocessed distillate generated from vacuum distillation of resin products), once-through noncontact cooling water, and storm water. Sanitary wastewater is treated by a trickling filter. Process waste water is treated by the facilities bio-oxidation plant, which includes an adsorption clarifier filter followed by two carbon adsorption filters that are operated in series. The adsorption filter and activated carbon treatment system was placed in operation on September 30, 1991. Sludge wasted from the bio-oxidation plant is aerobically digested and dewatered using a vacuum filter. Dewatered sludge is accumulated in roll-off boxes and delivered off-site as hazardous waste. The facilities storm water collection system receives boiler and cooling tower blow-down as well as storm water, which is diverted to an interruption pond and subsequently treated by the bio-oxidation plant. Storm water has been continuously diverted to the interruption pond since December 1991. Prior to this, it was routinely discharged through outfall 001. Once-through noncontact cooling water is continuously monitored for phenol levels and can be diverted to the interruption pond, if necessary. Final effluent discharges to Taylor Creek through outfall 001 at RM 2.10. Taylor Creek flows into the Scioto River at RM 213.07.

Whole effluent 48-hr. screening bioassays of Outfall 001 effluents were conducted by Ohio EPA personnel at the Occidental Chemical Corp. using the fathead minnow, *Pimephales promelas*, and *Ceriodaphnia dubia* as test organisms. The effluent is considered to be acutely toxic if 20 percent or more of either species of test organism in 100 percent effluent exhibits any combination of mortality, immotility or loss of equilibrium. Test results are invalid if more than 10 percent of either species of test organism in the control exhibits the adverse effects. When sufficient adverse effects occur to determine a median lethal concentration (LC50) and median effect concentration (EC50), *P. promelas* and *C. dubia* static-acute definitive toxicity tests are initiated using a 24-hr composite derived effluent sample. Bioassay number 95-1467-NW was conducted in April 1995. Effluents and the Taylor Creek samples were not acutely toxic to *P. promelas* and *C. dubia*. No mortality or any other adverse acute effects were observed for either species tested. Bioassay number 95-1448-NW was conducted in March 1995. Effluents were acutely toxic to *C. dubia*. There was 25 percent *C. dubia* mortality in the 28 March effluent grab and 5 percent in the 24-hr. composite derived sample during the 48-hr. exposure period. No *C. dubia* mortality was observed in the 27 March effluent grab and Taylor Creek samples. No *P. promelas* mortality or any other adverse acute effects were evident in Taylor Creek and the effluent samples. Bioassay number 91-921-NW was conducted in November 1991. Effluents and the Taylor Creek acute mixing zone samples were acutely toxic to *P. promelas* and *C. dubia*. The 48-hr. *C. dubia* LC50 and EC50 with 95 percent confidence limits were 37.0 percent by volume effluent (27.8-46.9) and 36.3 percent (28.4-44.7), respectively. The *P. promelas* 96-hr. LC50 and EC50 were 14.7 percent (12.8-17.1) and 13.1 percent (11.4-15.1), respectively.

The Occidental Chemical Corp. conducted acute and chronic toxicity tests of outfall 001 during 1991-1994. Results of the tests performed are summarized in Tables A-10 and A-11. The Allowable Effluent Toxicity (AET) for the Occidental Chemical Corp. is 1.0 acute toxic units

(TU_a) and 1.8 chronic toxic units (TU_c). The acute test results show a distinct improvement between February and October 1992. After this date, only one of twelve results was greater than the AET. Five of the seven chronic tests exceeded the allocated toxicity. Only the test conducted on 8 March, 1994 showed no chronic toxicity.

Pollutant loadings of TSS and BOD_5 track mean annual discharge (Figure 6), and exhibit a significant decline after 1991 due to the continuous diversion of storm water through the bio-oxidation plant. Ammonia-nitrogen loadings increased sharply in 1995 compared with 1993 and 1994; monitoring was not required until 1993. Loadings of phenol remained relatively stable from 1978 through 1992, after which monitoring requirements and discharge limits for phenol were eliminated at outfall 001. The facility has limits and is required to monitor phenol at internal outfall 601.

No NPDES permit violations were documented during the period October 1994-September 1995. Effluent samples collected in association with the survey were also evaluated for NPDES permit compliance, with no violations documented.

Effluent samples collected in association with the survey were analyzed for inorganic and organic constituents. Priority organic compounds detected are presented in Table 6. The only compounds detected were dibromochloromethane and phenol. Tentatively identified organic compounds detected are presented in Table A-5.

City of Kenton WWTP

The City of Kenton WWTP, NPDES permit number 2PD00020, is located at 14854 Gilmore Rd., Kenton, OH 43326. The current permit became effective on 1 April 1992 and expires on 28 March 1997. The advanced treatment system includes comminution, grit removal, pre-aeration, primary settling, conventional activated sludge, final settling, and chlorination. Sludge is anaerobically digested, dewatered, and land applied. It was constructed in approximately 1955 and has 70 percent separate and 30 percent combined sewers in the collection system, with several overflows. The design capacity of the facility is 1.6 MGD, while the hydraulic capacity is 2.1 MGD, and annual average discharge is 1.4 MGD. Final effluent discharges to the Scioto River through outfall 001 at RM 211.40. Combined sewer overflows discharge to the Scioto River at the following locations: outfall 003, RM 212.50; outfall 010, RM 212.45; outfall 011, RM 212.25; outfall 004, RM 212.20; outfall 009, RM 212.05; outfall 005, RM 211.90; outfall 006, RM 211.85; outfall 007, RM 211.75;

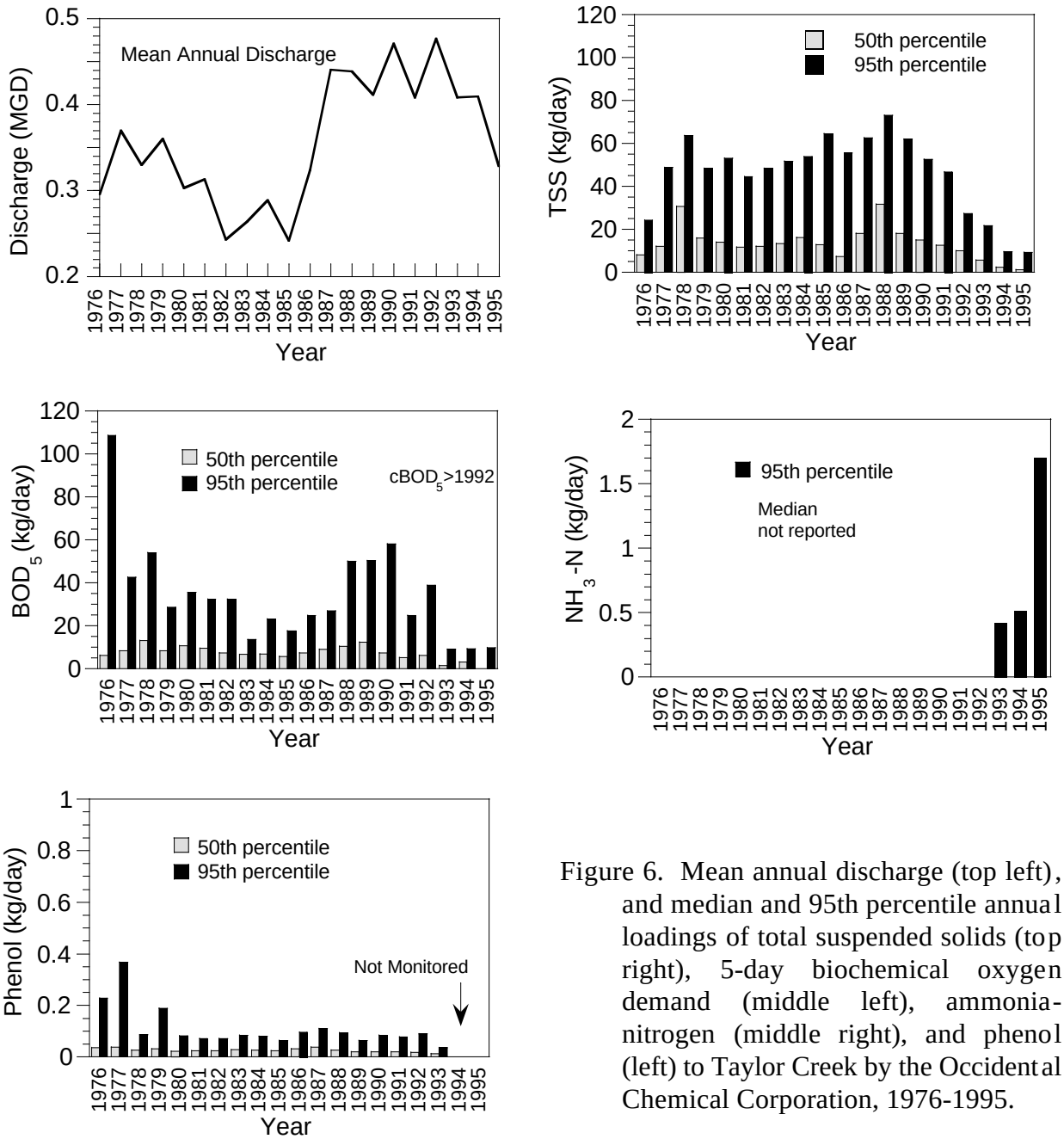


Figure 6. Mean annual discharge (top left), and median and 95th percentile annual loadings of total suspended solids (top right), 5-day biochemical oxygen demand (middle left), ammonia-nitrogen (middle right), and phenol (left) to Taylor Creek by the Occidental Chemical Corporation, 1976-1995.

in January 1992 due to numerous NPDES permit violations. This order requires the city to eliminate all plant bypasses and sewer system overflows and to attain final effluent limits by 1 January 2000. The order was amended in May 1995 and interim final effluent limits became effective on 31 May 1995.

Whole effluent 48-hr screening bioassays of outfall 001 effluents were conducted by Ohio EPA and outfall 008, RM 211.41. The City of Kenton entered into a Consent Order with the State of Ohio personnel at the Kenton WWTP using the fathead minnow, Pimephales promelas, and Ceriodaphnia dubia as test organisms. Bioassay number 95-1526-NW was conducted in July 1995. Effluents were not acutely toxic to *P. promelas* or *C. dubia*. No mortality of *P. promelas* was observed. Mortality of *C. dubia* in the 24 and 25 July effluent grab samples was 5 and 10 percent, respectively, during the 48-hr. exposure period. Bioassay number 95-1494-NW was conducted in June 1995. Effluents were not acutely toxic to *P. promelas* or *C. dubia*. The mortality of *P. promelas* was 5 percent in the upstream, acute mixing zone, and 5 June effluent grab samples. There was 10 percent mortality of *C. dubia* in the 5 June effluent grab sample during the 48-hr. exposure period. Bioassay number 91-856-NW was conducted in April 1991. There was no mortality or any other adverse acute effects exhibited by the *P. promelas* or *C. dubia* exposed in any sample.

The City of Kenton conducted acute and chronic toxicity tests of outfall 001 during 1992-1993 as part of a Category 3 testing program. Results of the tests performed are summarized in Appendix Tables A-8 and A-9. The Allowable Effluent Toxicity (AET) for the Kenton WWTP is 0.5 acute toxic units (TU_a) and 2.4 chronic toxic units (TU_c). The acute test results show only one result greater than the AET. The chronic tests show some adverse effect in four of the five samples, with the 15 June 1992 result exceeding the allocated toxicity. An additional year of chronic testing is recommended after proposed plant upgrades are completed.

Plant discharge has been erratic and shows no appreciable trend (Figure 7). Pollutant loadings appear independent of mean discharge, and have been relatively stable (especially median values) over the period of record suggesting a relatively stable influent volume (Figures 7 and 8). Increasing variability in loadings subsequent to 1992 reflects a change in the final effluent sampling point to include flows from the facilities primary bypass. Orders of magnitude differences in median and 95th percentile loadings of TSS and BOD_5 ceased after 1983 due to an improvement in sludge handling. Loadings of NH_3-N exhibit a decrease in variability through 1984, with a sharp increase between 1985-1987 (Figure 8), coinciding with a peak in mean annual discharge exceeding design capacity. The cause for this is not known, but points to poor plant performance and possible bypassing of raw sewage. Phosphorus concentrations in the effluent have generally exceeded 1 mg/l.

NPDES permit violations documented from October 1994-September 1995 are listed in Table 7. Numerous violations of D.O., TSS, $cBOD_5$, fecal coliform, and TRC were documented. Excessive hydraulic overloading due to wet weather flows is the suspected cause of permit violations. Wet

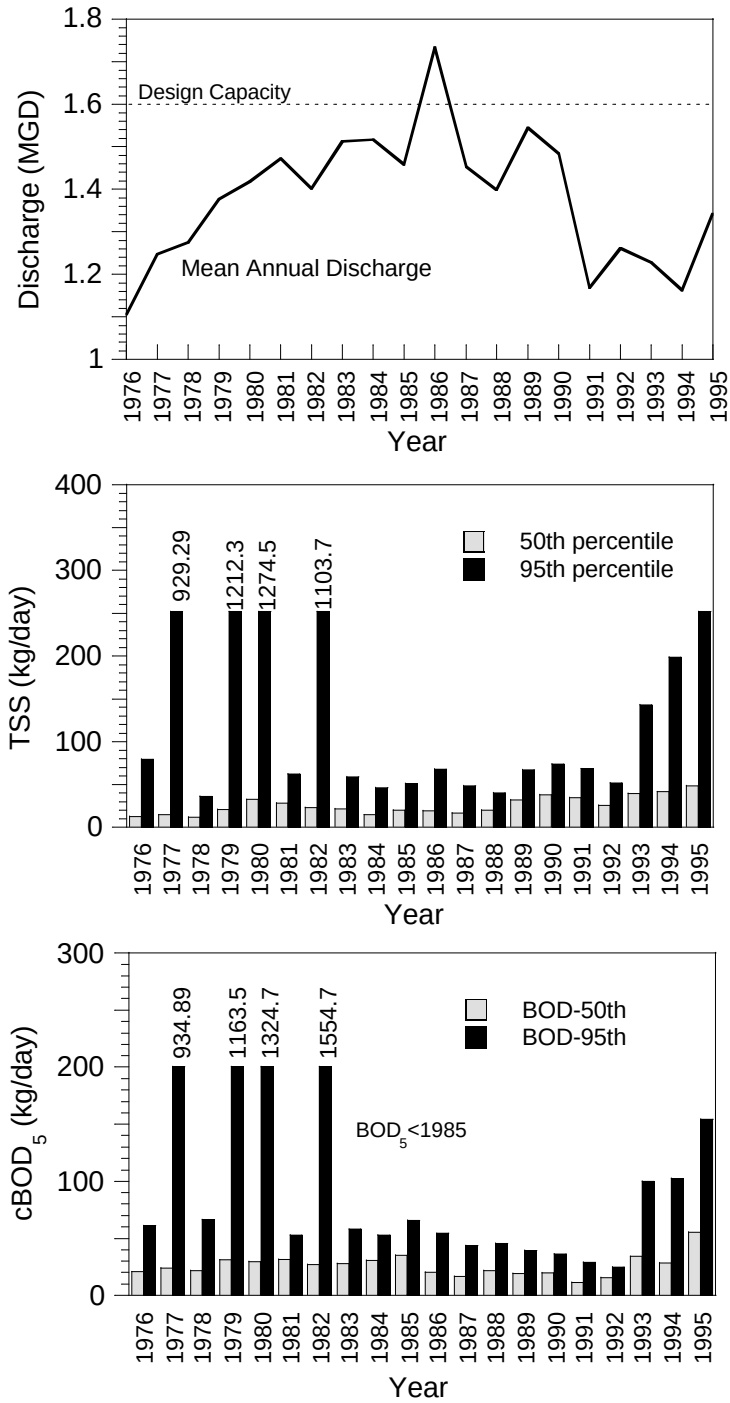


Figure 7. Annual mean discharge (top), and annual median and 95th percentile loadings of total suspended solids (middle) and 5-day carbonaceous biological oxygen demand (bottom) by the Kenton WWTP to the Scioto River.

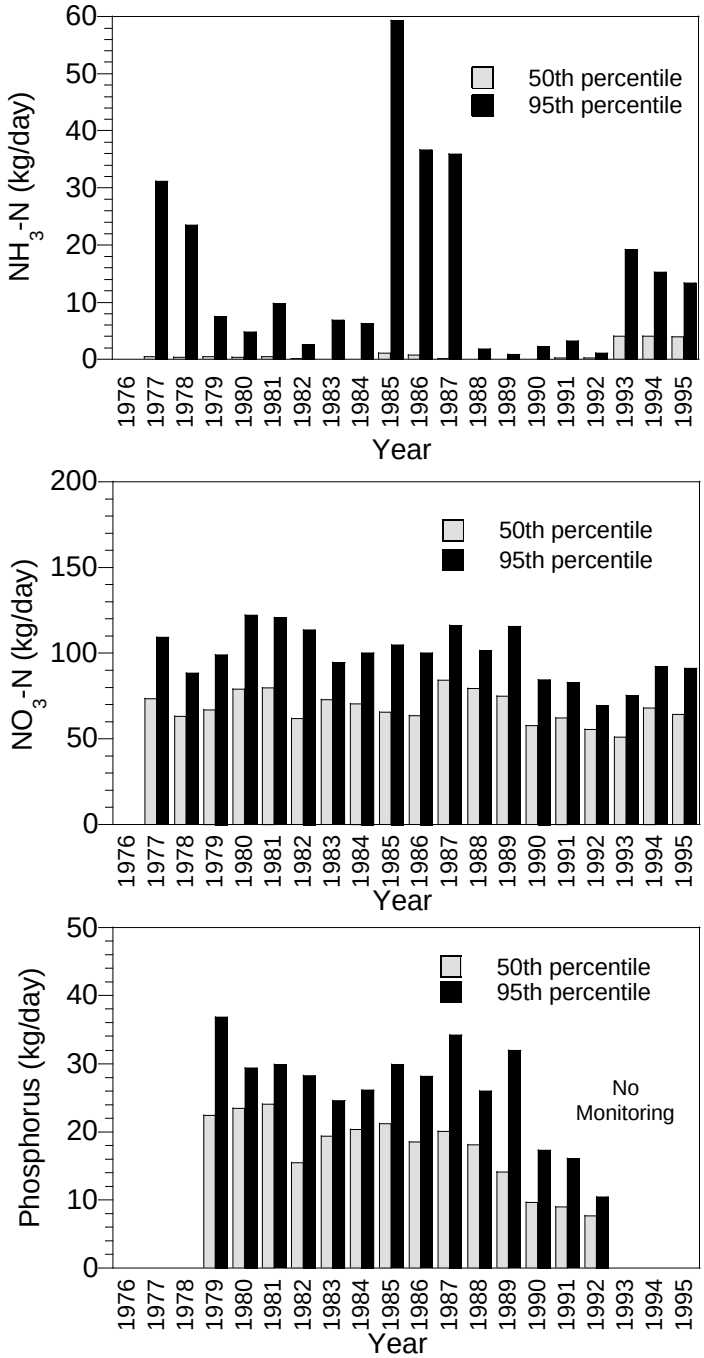


Figure 8. Median and 95th percentile annual loadings of ammonia-nitrogen (top), nitrate-nitrogen (middle) and phosphorus (bottom) by the Kenton WWTP to the Scioto River

weather flows are bypassed from the primary sedimentation tank, thereby bypassing the aeration tanks, to the chlorine contact tank, where they blend with secondary effluent. Effluent samples collected in association with the survey were also evaluated for NPDES permit compliance. Results were evaluated based on interim limits effective 31 May 1995. Three fecal coliform violations were documented.

Effluent samples collected in association with the survey were analyzed for inorganic and organic constituents. Priority organic compounds detected are presented in Table 6. The only compounds detected were bromodichloromethane, chloroform, and dibromochloromethane.

Table 6. Concentrations of priority organic pollutants detected in the Kenton WWTP and Occidental Chemical Corporation outfall 001 effluents during July-September 1995. Corrected method detection limits for non-detected (ND) pollutants, based on dilution of sample, are presented in parenthesis. Compounds below the method detection limit are not listed. Tentatively identified non-priority organic compounds detected are presented in Table A-5.

PARAMETER	**Kenton WWTP**	**Occidental Chemical**
VOLATILE ORGANIC COMPOUNDS (μg/l or ppb)		
July 19		
Bromodichloromethane	1.8	ND (0.5)
Chloroform	3.6	ND (0.5)
Dibromochloromethane	0.8	ND (0.5)
August 14		
Bromodichloromethane	1.1	ND (0.5)
Chloroform	2.6	ND (0.5)
September 11		
Bromodichloromethane	2.7	ND (0.5)
Chloroform	4.4	ND (0.5)
Dibromochloromethane	0.9	0.6
SEMI-VOLATILE ORGANIC COMPOUNDS (μg/l or ppb)		
September 11		
Phenol	ND (2.0)	5.4

Table 7. Summary of NPDES permit violations at the City of Kenton WWTP from October 1994-September 1995. Violations are summarized for monthly concentration minimum (MCMN), monthly concentration average (MCAV), monthly concentration maximum (MCMX), monthly average loading (MQAV), and monthly maximum loading (MQMX). Interim final effluent limits effective May 31, 1995 relaxed TSS, $cBOD_5$, and NH_3-N limits and contain no limits for pollutant loadings.

		Number and Type of Violation				
Date	Parameter	MCMN	MCAV	MCMX	MQAV	MQMX
10-94	Fecal Coliform		1	3		
	pH	1				
	Residual Chlorine			21		
11-94	Dissolved Oxygen	1				
	Oil and Grease			1		
12-94	TSS		1	1		1
01-95	TSS		1	1		1
02-95	TSS		1	2	1	2
	$cBOD_5$		1		1	1
03-95	TSS		1	2	1	2
	$cBOD_5$				1	1
04-95	TSS		1	2	1	2
	$cBOD_5$		1	1	1	1
05-95	TSS		1	1	1	1
	$cBOD_5$		1	4	1	4
	Residual Chlorine			22		
07-95	Fecal Coliform		1	3		
08-95	Fecal Coliform		1	2		
09-95	Fecal Coliform			1		

Reed Road Subdivision WWTP
Reed Road Subdivision, NPDES permit number 2PG00004, is located at 17027 McDonald Township Road (T.R.) 39. The current permit became effective on 1 August, 1993 and expires on 28 July, 1998. The treatment system used at this facility is an extended aeration package plant with surface sand filters and chlorination. It was constructed in approximately 1973 and has 100 percent separate sewers in the collection system. The design capacity of the facility is 0.0072 MGD. Final effluent discharges to the Scioto River at RM 230.75.

Hardin County Home WWTP
Hardin County Home, NPDES permit number 2PG00079, is located at 12846 S.R. 309 West. The current permit became effective on 1 December, 1992 and expires on 27 November, 1997. The treatment system used at this facility is an extended aeration package plant with chlorination. It was constructed in approximately 1972. The design capacity of the facility is 0.03 MGD. Final effluent discharges to the Scioto River at RM 214.00.

Rockwell International
Rockwell International, NPDES permit number 2IS00000, is located at 13267 S.R. 68 South, Kenton, OH 43326. On 30 August, 1995, Rockwell International eliminated all discharges to Taylor Creek. Sanitary and wastewater streams now discharge to the City of Kenton WWTP. Wastewater receives pre-treatment before being discharged to the city sanitary sewer. Rockwell formerly discharged to Taylor Creek from outfall 001 at RM 1.35 and outfall 002 at RM 1.26.

Fairwayview Subdivision WWTP
Fairwayview Subdivision, NPDES permit number 2PG00012, is located at Hardin County Road (C.R.) 144. The current permit became effective on 1 August, 1994 and expires on 31 July, 1999. The treatment system used at this facility is an extended aeration package plant with surface sand filters and chlorination. It was constructed in approximately 1968 and has 100 percent separate sewers in the collection system. The design capacity of the facility is 0.033 MGD, while the hydraulic capacity is 0.066 MGD, and the annual average discharge is 0.030 MGD. Final effluent discharges to an unnamed tributary which flows into the Scioto River at RM 209.90.

Eldridge Station Hills Estates Subdivision WWTP
Eldridge Station (Pfeiffer Station) Hills Estates Subdivision, NPDES permit number 2PG00005, is located at 20127 Hardin C.R. 144. The current permit became effective on 1 August, 1993 and expires on 28 July, 1998. The treatment system used at this facility is an extended aeration package plant with chlorination. It was constructed in approximately 1972 and has 100 percent separate sewers in the collection system. The design and hydraulic capacities of the facility are 0.008 MGD. Final effluent discharges to the Scioto River at RM 205.00.

Indian Trails Mobile Home Park WWTP
Indian Trails Mobile Home Park (MHP), NPDES permit number 2PY00016, is located at 6605 Marion-Agosta Rd., Marion, OH 43302. The current permit became effective on 1 March, 1994

and expires on 28 February, 1999. The treatment system used at this facility includes a split box, aeration, settling, and tertiary lagoons. It was constructed in approximately 1971 and has 100 percent separate sewers in the collection system. The design capacity of the facility is 0.055 MGD, while the annual average discharge is 0.017 MGD. Final effluent discharges to an unnamed tributary which flows into the Scioto River at RM 187.30. The Village of New Bloomington has requested the Indian Trails MHP to execute a request for service by their proposed WWTP.

Village of Prospect WWTP

The Village of Prospect WWTP, NPDES permit number 2PA00041, is located at 7317 S.R. 203 South, Prospect, OH 43342. The current permit became effective on 2 January, 1995 and expires on 31 December, 1999. The treatment system used at this facility includes oxidation ditches, final settling, sludge tanks, and sludge beds. It was constructed in approximately 1976 and has 100 percent separate sewers in the collection system. The design capacity of the facility is 0.12 MGD, while the hydraulic capacity is 0.40 MGD, and the annual average discharge is 0.10 MGD. Final effluent discharges to the Scioto River at RM 170.93.

Unsewered Areas

Several incorporated villages in the Scioto River study area have no centralized wastewater collection or treatment facilities. Residential and commercial establishments in these areas are served primarily by septic tanks, aeration systems, and sub-surface sand filters. These types of sanitary wastewater treatment systems typically have "off-lot" discharges, especially when shallow bedrock, poorly drained soils, or small lot sizes do not allow for the installation of leach fields. These off-lot discharges are normally received by a storm water sewer system which discharges to a nearby stream. Incorporated villages in the study area which have no centralized wastewater collection or treatment facilities include: Ridgeway, Mt. Victory, LaRue, New Bloomington, and Green Camp.

Village of Ridgeway

The Ohio EPA issued Director's Final Findings and Orders (DFFOs) to the Village of Ridgeway on 15 May, 1991 requiring the village to submit a general plan for sewerage improvements no later than 6 months from the effective date of the orders. This date was extended to 1 September, 1992 and again extended to 30 September, 1992. Ohio EPA received a general plan for the centralized collection and treatment of sanitary waste on 1 October, 1992. However, this plan was incomplete and a revised plan was requested. To date, no revised plan has been submitted.

Village of Mt. Victory

The Ohio EPA issued DFFOs to the Village of Mt. Victory on 9 January, 1991 requiring the village to submit a general plan for sewerage improvements by 1 March, 1991. Mt. Victory submitted a general plan for the centralized collection and treatment of sanitary waste to Ohio EPA on 4 April, 1991, which was approved on 23 August, 1991. The Ohio EPA issued DFFOs to the Village of Mt. Victory on 15 January, 1992 containing a compliance schedule for implementing the proposed work in the general plan. A set of detailed plans and a PTI application for Phase I

sewers was submitted on 9 April, 1993 and approved on 29 June, 1993. A set of detailed plans and PTI application for Phase II sewers and treatment facilities was submitted on 11 January, 1994, revised on 2 May, 1994, and approved on 8 June, 1994. An initial application for an NPDES permit was submitted on 30 September, 1994 and a permit is currently being drafted. The village will be assigned NPDES permit number 2PA00046. The new facility will utilize a three celled, controlled discharge lagoon and is tentatively scheduled for completion in 1996. The proposed location is at the intersection of S.R. 31 and Hale T.R. 209. Final effluent from the facility will discharge to Panther Creek. The design capacity of the facility is 0.09 MGD, while the hydraulic capacity is 0.54 MGD.

Village of LaRue

The Ohio EPA issued DFFOs to the Village of LaRue on 18 October, 1993 requiring the village to submit a general plan for sewerage improvements no later than 6 months from the effective date of the orders. Ohio EPA received a general plan for the centralized collection and treatment of sanitary waste on 24 June, 1994. However, this plan was not approved and a revised plan was requested. Revisions were submitted on 28 August, 1994 and subsequently approved on 16 September, 1994. The general plan proposes completion of construction in November 1996. The proposed facility will be a controlled discharge lagoon located on Montgomery T.R. 28-A and discharging to the Scioto River.

Village of New Bloomington

The Village of New Bloomington submitted an NPDES permit application and was issued NPDES permit number 2PA00065 for a proposed wastewater treatment facility in 1976. However, the proposed facilities were never constructed. The Ohio EPA issued DFFOs to the Village of New Bloomington on 28 October, 1993 requiring the village to submit a general plan for sewerage improvements no later than 6 months from the effective date of the orders. Ohio EPA received a general plan for the centralized collection and treatment of sanitary waste on 24 November, 1993 and a Permit to Install (PTI) application on 14 September, 1995.

Village of Green Camp

On 4 February, 1994, Ohio EPA received correspondence designating Stults and Associates, Inc. as the village engineers for the proposed sanitary sewer project in the Village of Green Camp.

Hazardous Waste Regulated Facilities

The Ohio EPA, Division of Hazardous Waste Management (DHWM) is responsible for the implementation of the federal Resource Conservation and Recovery Act (RCRA). The DHWM issues hazardous waste facility permits to entities that treat, store, and dispose (TSDFs) of hazardous waste, conducts inspections at these facilities, and initiates enforcement action against those that are in significant non-compliance. The DHWM is also responsible for inspecting all known (notifiers) and suspected (non-notifiers) facilities that generate hazardous waste and investigating complaints of improperly managed hazardous waste sites to ensure compliance with regulations.

There are no permitted TSDFs in the Scioto River study area. However, several facilities that generate hazardous wastes and ship the material off-site for disposal are present. These facilities may have significant impacts on the chemical quality of sediments and surface water if wastes are improperly managed, or had historical impacts which have persisted. Facilities are characterized as large quantity generators if they generate > 1000 kg of waste per month, small quantity generators if they generate 100-1000 kg per month, and conditionally exempt generators if they generate < 100 kg per month. Large quantity generators in the study area include Occidental Chemical Corp., Rockwell International, and Parker-Hannifan Co.

Solid Waste Regulated Facilities

The Ohio EPA, Division of Solid and Infectious Waste Management (DSIWM) regulates the disposal of solid waste, construction and demolition waste, and infectious waste. The DSIWM reviews permits for new landfills and expansions of existing sites, transfer stations, and solid waste composting facilities, oversees the county solid waste planning process, and provides assistance and oversight to County Health Department solid waste programs.

Hardin County Landfill

The Hardin County Landfill is a closed facility located adjacent to the Scioto River on Hardin C.R. 130. The landfill has not accepted waste since 1990 and recently completed closure activities. Groundwater monitoring revealed elevated levels of vinyl chloride, 1,2-dichloroethylene, 1,1-dichloroethane, trichloroethene, PCB Aroclor 1016, and arsenic. This facility was the target of a U.S. EPA suit claiming the disposal of hazardous waste at an unlicensed facility. The suit was dismissed in court due to the invalidation of U.S. EPAs Mixture Rule. A leachate collection system has been installed and future hydro-geological studies are being planned in order to implement a "Corrective Measures Plan".

Unregulated Facilities

The Ohio EPA, Division of Emergency and Remedial Response (DERR) oversees cleanups at unregulated/uncontrolled hazardous waste sites based on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986. This law provides broad authority to investigate and remediate otherwise uncontrolled hazardous waste sites.

United Technologies Automotive Group (a.k.a. Essex Group, Inc.)

United Technologies Automotive Group is located at 350 Espy St., Kenton, OH 43326 and is approximately 500 feet south of the Scioto River near RM 212.50. The facility manufactures electronic ignition coils for the automotive industry with part of the process involving painting. Painting wastes include solidified sludge from wash water, toluene, and methylethyl ketone contaminated liquids and dried paint filters. Sludge is disposed off-site and wastewater is discharged to the sanitary sewer. A Screening Site Inspection (SSI) documented polycyclic aromatic hydrocarbon (PAH) and metal contamination of on site soils and metal contamination of an on site well. The principal path of concern is groundwater contamination of the municipal water

supply. Because of the small quantities of wastes produced and their frequent removal, this site is considered low priority for additional inspections.

Parker-Hannifan Corporation (a.k.a. Stratoflex Inc., a.k.a. B.F. Goodrich)
Parker-Hannifan Corp. is located at 2974 Marion-Green Camp Rd., Marion, OH 43302. B.F. Goodrich operated a disposal area north of the Village of Green Camp and adjacent to the Scioto River near RM 179.10. It was in operation from 1951-1967 during which waste rubber products containing strips of lead were burned, along with small amounts of rubber cement material containing trichlorophenol. The area was partially covered, although some waste material remains on the surface. Parker Hannifan Corp. learned of the disposal area during negotiations to acquire the facility and contracted ICF/SRW Associates to determine if any significant degradation of soil, groundwater, or surface water had occurred. Findings indicated that levels of arsenic, cadmium, chromium, copper, lead, nickel, silver, vanadium, and zinc in soils may be elevated in certain locations.

Pollutant Spills
An evaluation of pollutant spills reported to the Ohio EPA, Division of Emergency and Remedial Response (DERR) Release Reporting System (RRS) was conducted to estimate the impact of these occurrences on the chemical quality of sediments and surface water and impacts to biota in the Scioto River study area. Results of spills reported to RRS between January 1995 and December 1995 are presented in Table 8. The most common spill reported was the bypass of sewage from the Kenton WWTP. These discharges occur during rainstorm events when the facility becomes hydraulically overloaded.

Fish Kills
Four fish kills were reported for streams in the upper Scioto River study area since 1983 (Table 9). Three of the kills were in Taylor Creek, reflecting abuses by the point source discharges.

Table 8. Summary of pollutants spilled into the Scioto River and its tributaries reported to the Ohio EPA Division of Emergency and Remedial Response from January 1995-December 1995.

Date	Entity	Material	Amount	Waterway
06-21-95	Kenton WWTP	Sewage	60,000 gal	Scioto River
06-22-95	Kenton WWTP	Sewage	19,000 gal	Scioto River
07-25-95	Kenton WWTP	Sewage	42,000 gal	Scioto River
08-05-95	Occidental Chemical	Wastewater	unknown	Taylor Creek
08-13-95	Kenton WWTP	Sewage	unknown	Scioto River
10-03-95	Kenton WWTP	Sewage	55,000 gal	Scioro River
10-05-95	Kenton WWTP	Sewage	unknown	Scioto River
10-31-95	Kenton WWTP	Sewage	336,000 gal	Scioto River
12-14-95	Kenton WWTP	Sewage	272,000 gal	Scioto River

Table 9. Fish kills reported in the upper Scioto River Basin study area, 1984 - 1995.

River	Date	RM	Number Killed	Pollutant
Taylor Creek	April 29, 1986	na	17	not reported
Taylor Creek	September 22, 1987	na	4001	unknown
Taylor Creek	June 13, 1988	na	102	phenol
Silver Creek	April 02, 1984	na	113	not reported

Surface Water Quality

Scioto River

Six sets of surface water grab samples for conventional inorganic analysis (i.e. metals and nutrients) and three sets for microbiological analysis were submitted from thirty-two sampling stations in the Scioto River study area during July-September 1995. Three sets of samples for the analysis of volatile and semi-volatile organic compounds were submitted from the Kenton WWTP outfall 001 effluent and the Occidental Chemical Corp. outfall 001 effluent. Results of the analyses are presented in Appendix Tables A-1 and A-6. Results of additional composite samples collected by the Ohio EPA Monitoring and Assessment Section are presented in Table A-2.

Sampling stations were selected to assess ambient water quality and impacts from point and non-point pollution sources. The primary point sources evaluated were the City of Kenton WWTP, the Occidental Chemical Corp., and the Village of McGuffey WWTP. The primary non-point source evaluated was runoff from agricultural areas. Impacts from residential areas with no centralized collection or treatment of sanitary wastewater (unsewered areas) were also evaluated, including the Villages of Ridgeway, Mt. Victory, LaRue, New Bloomington, and Green Camp.

Analytical results were evaluated to document violations of Ohio Water Quality Standards (Ohio Administrative Code Chapter 3745-1) based on appropriate aquatic life and recreational use designations and to document violations and/or exceedences of public water supply use criteria. Public water supply criteria are violated only if a stream segment is so designated. The Scioto River is designated as a public water supply from RM 148.8 - 133.4.

Numerical chemical water quality bio-criteria exist for the prevention of chronic toxicity (CAC), prevention of acute toxicity (AAC), and prevention of lethality (FAV) for several pollutants analyzed. The CAC and AAC values apply to outside mixing zone samples, while the FAV values apply to inside mixing zone samples. Minimum and average criteria exist for dissolved oxygen (D.O.). Primary and secondary contact recreation criteria apply to fecal coliform counts. At several sampling stations, Datasonde® continuous monitors were deployed to determine if diel fluctuations in D.O. concentration occur, recording hourly measurements for a 48 hr. period. A summary of these measurements is presented in Table A-3 and Figure 9. These measurements are useful in evaluating nutrient enrichment, indicating the presence of nuisance growths of algae

and/or extensive oxidation of organic and inorganic matter. Mean concentrations of D.O. (dissolved oxygen), BOD_5 (5-day biochemical oxygen demand), NH_3-N (ammonia-nitrogen), NO_x-N (nitrate+nitrite-nitrogen), total phosphorus (P), and total nonfilterable residue (total suspended solids, TSS) were determined and plotted in a longitudinal fashion to display trends in these physical and chemical properties (Figures 10 and 11).

The sampling station located on the Scioto River at Hardin C.R. 25 (RM 234.39) was intended to evaluate ambient water quality and impacts from nonpoint sources. No violations of Ohio Water Quality Standards (WQS) were documented. The mean D.O. concentration was 7.7 mg/L; mean concentrations of BOD_5, NH_3-N, NOx-N, TSS and P were below method detection limits or present at ambient levels for the ECBP ecoregion, indicating very good water quality and, in particular, the TSS results indicate no impact from sedimentation.

The sampling station located on the Scioto River at Hardin C.R. 190 (RM 231.86) evaluated water quality impacts from the Village of Roundhead. The Village of Roundhead has no centralized collection or treatment of sanitary wastewater. No violations of Ohio WQS were documented. The mean D.O. concentration was 8.0 mg/L. Also, a Datasonde® continuous monitor was deployed at RM 231.80. The upper (75th percentile) and lower (25th percentile) quartile values ranged from 6.10 mg/L to 7.15 mg/L showing little diurnal fluctuation and no nutrient enrichment impact. Mean concentrations of BOD_5, NH_3-N, NOx-N, TSS and P were below method detection limits or present at ambient levels for the ECBP ecoregion. These results are very similar to RM 234.39, indicating virtually no impact from the Village of Roundhead.

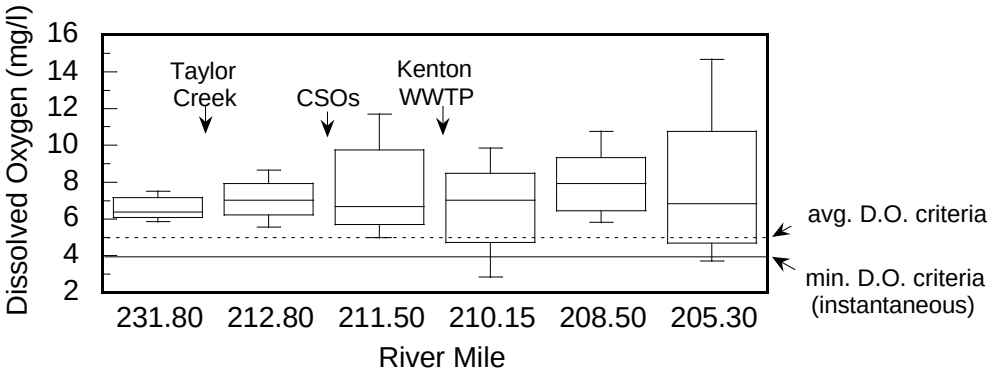


Figure 9. Distributions of dissolved oxygen concentrations measured in the Scioto River over a 48 h interval with Datasonde® continuous monitors.

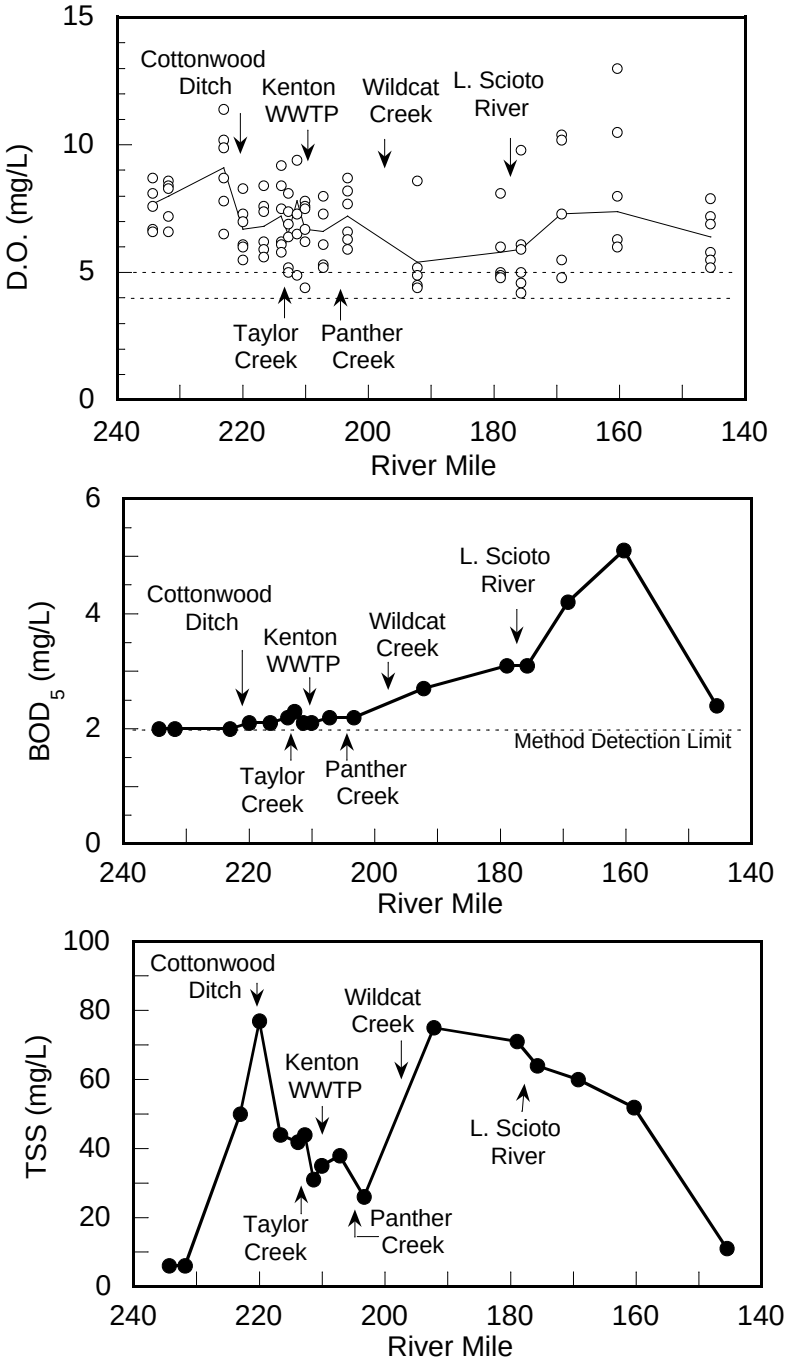


Figure 10. Concentrations of D.O. (top), and mean concentrations of BOD_5 (middle) and TSS (bottom) in water quality grab samples collected from the Scioto River, 1995, in relation to the Kenton WWTP and selected tributaries. The variability in the BOD_5 and TSS plots are not cause by influential values.

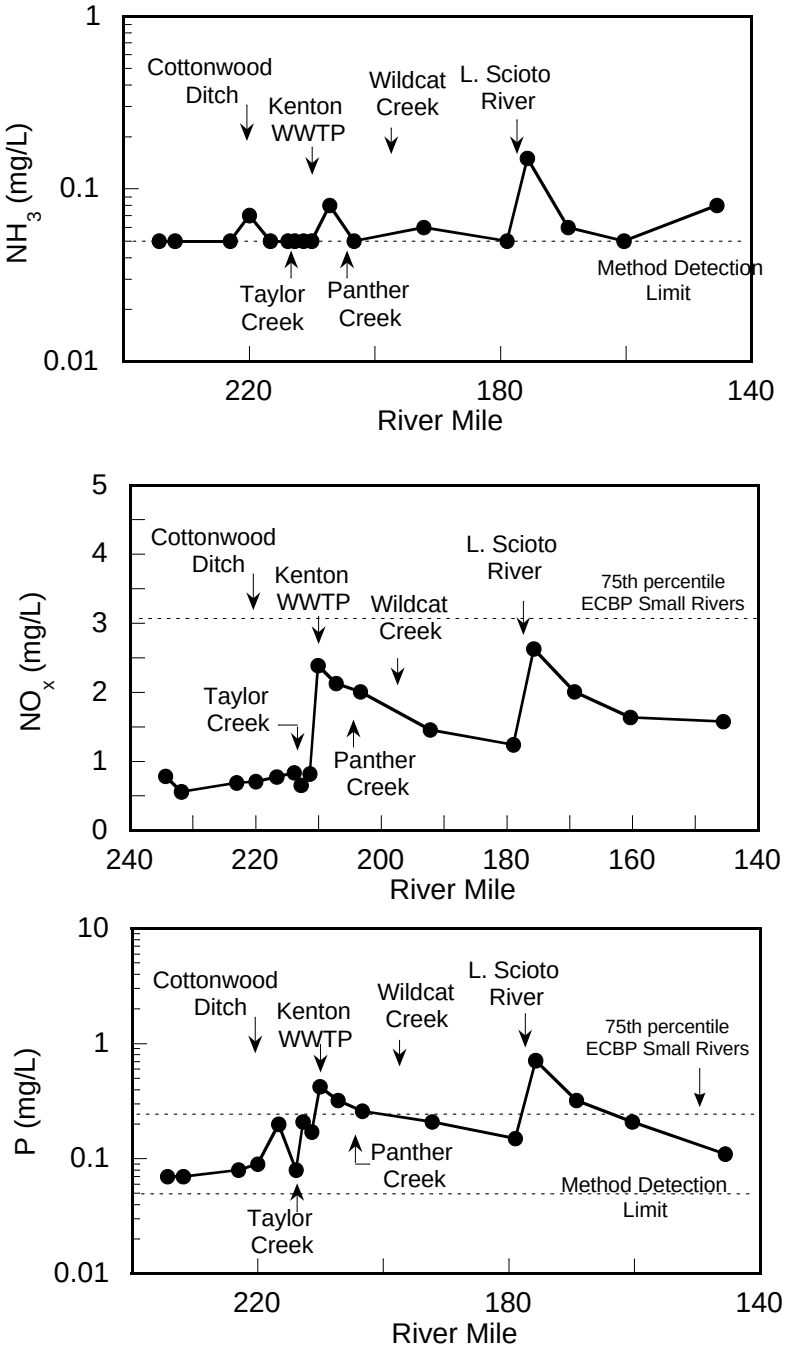


Figure 11. Mean concentrations of NH_3-N (top), NO_x-N (middle), and total P (bottom) in water quality grab samples collected from the Scioto River, 1995, in relation to the Kenton WWTP and select tributaries.

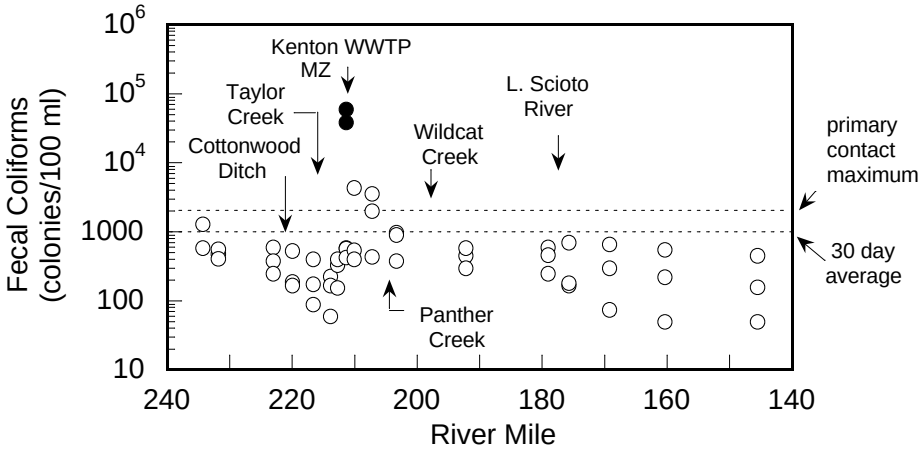


Figure 12. Fecal coliform colonies (number/100ml) in water quality grab samples collected from the Scioto River, 1995, in relation to select tributaries and the Kenton WWTP.

Water quality upstream from Cottonwood Ditch was evaluated at Hardin C.R. 110 (RM 223.05). No violations of Ohio WQS were documented. However, D.O. concentrations showed wide variation and TSS and P concentrations increased relative to upstream, suggesting enrichment impacts from nonpoint pollution. The impacts were likely exacerbated by recent channelization.

The sampling station located on the Scioto River at Hardin C.R. 95 (RM 220.05) was intended to evaluate potential water quality impacts associated with Cottonwood Ditch at RM 221.05. The mean TSS concentration was 77 mg/L, the highest documented in the Scioto River mainstem portion of the study area. The mean P concentration, 0.09 mg/L, increased compared to upstream sites. The wide variation in D.O. concentrations noted at the previous site was not evident here however, probably muted by improved habitat. No violations of Ohio WQS were documented. These results indicate only a slight impact from the confluence of Cottonwood Ditch, most significantly the increase in TSS and P.

Continued water quality impact or recovery downstream from Cottonwood Ditch was evaluated at Hardin C.R. 106 (RM 216.67). The mean P concentration, 0.20 mg/L, continued to increase, although the result was biased by a single high value of 0.87 mg/L. Otherwise results indicate very little change in chemical water quality compared to upstream. No violations of Ohio WQS were documented.

Ambient water quality and potential impacts from the Hardin County Solid Waste Landfill was sampled at Hardin C.R. 130 (RM 213.90). No violations of Ohio WQS were documented, and water quality parameter concentrations were similar to or less than concentrations noted upstream

indicating no impact from the county landfill. It should be noted, however, that stream litter is abundant below the C.R. 130 bridge. This was reported to the Ohio EPA, Division of Solid and Infectious Waste and the Hardin County Health Department.

Water quality parameters measured downstream from Taylor Creek adjacent Riverside Ave. (RM 212.77) were similar to values observed upstream except for phosphorus. No violations of Ohio WQS were documented. Values from a Datasonde® continuous monitor were normally distributed over a relatively narrow range, with a median value of 7.0 mg/L demonstrating no gross nutrient impacts from the phosphorus loads from Taylor Creek.

Impacts from combined sewer overflows (CSOs) upstream from the Kenton WWTP were assessed at RM 211.42. One violation of the average D.O. criterion, two violations of the AAC for Hg, and one violation of the CAC for Hg were documented. The source of Hg is unknown and should be investigated. Though most water quality parameter concentrations were similar to upstream sites, nutrient enrichment impacts from were evident in the wide diurnal D.O. fluctuations recorded by a Datasonde® continuous monitor and elevated P concentrations ($\bar{x}$ = 0.17 mg/L).

Kenton WWTP outfall 001 effluent (RM 211.40) was evaluated for NPDES permit compliance. Three fecal coliform violations were documented. The mean D.O. concentration was 7.3 mg/L; the mean $cBOD_5$ concentration was 7.7 mg/L; the mean NH_3-N concentration was 1.28 mg/L; the mean NO_x-N concentration was 13.38 mg/L; the mean TSS concentration was 11 mg/L; the mean P concentration was 2.34 mg/L; and the mean oil and grease concentration was 1.92 mg/L. These results indicate, overall, fair effluent quality. It should be noted that the facility is currently regulated under interim permit limits contained in a Consent Order effective 31 May, 1995. A more detailed discussion of the Kenton WWTP is contained in the pollutant loadings section.

The sampling station located on the Scioto River at the Kenton WWTP outfall 001 mixing zone (RM 211.39) was intended to evaluate near field (acute) impacts. One violation of the FAV for Hg was documented (Table 10). The mean D.O. concentration was 7.4 mg/L; the mean BOD_5 concentration was 14.8 mg/L; the mean NH_3-N concentration was 0.97 mg/L; the mean NO_x-N concentration was 8.10 mg/L; the mean TSS concentration was 29 mg/L; the mean P concentration was 1.46 mg/L; and the mean oil and grease concentration was 1.81 mg/L. Fecal coliform counts exceeded primary and secondary contact standards averaging greater than 39,000/100ml in all samples (Figure 12).

Far-field water quality impacts to the Scioto River from the Kenton WWTP were measured at Hardin C.R. 175 (RM 210.07). One violation of the average D.O. criterion and one violation of the primary contact criterion for fecal coliform were documented. NO_x-N and P concentrations were elevated compared to sites sampled upstream from Kenton. The nutrient enrichment impact was manifest as wide swings in diurnal D.O. concentrations. Datasonde© continuous monitor upper and lower quartile values ranged from 4.73 mg/L to 8.50 mg/L.

Continued water quality impacts from the Kenton WWTP were noted at Dudley T.R. 199 (RM 207.26). Two violations of the primary contact criterion for fecal coliform were documented (Table 10). The mean D.O. concentration was 6.6 mg/L with a similar variance to that noted upstream. Mean NO_x-N and P concentrations remained elevated, at 2.13 mg/L and 0.32 mg/L, respectively.

Effects of nutrient enrichment from the Kenton WWTP on water quality remained evident at Hardin C.R. 227 (RM 203.36). Although no violations of Ohio WQS were documented, elevated mean NO_x-N and P concentrations persisted. D.O. concentrations improved, however, and showed slightly less variation. No impact from Panther Creek was detected.

Residual water quality impacts from the Kenton WWTP were still evident at the Montgomery T.R. 30 sampling location (RM 192.21), and likely exacerbated by the Village of LaRue. The Village of LaRue has no centralized collection or treatment of sanitary wastewater. Four violations of the average D.O. criterion were documented. The mean D.O. concentration was 5.4 mg/L. High P ($\bar{x}$=0.21 mg/L) concentrations persisted. The mean TSS concentration increased dramatically to 75 mg/L. No impacts associated with Wildcat Creek were evident.

The combined effect of nutrient enrichment from the Kenton WWTP and Village of LaRue lingered at the sampling station adjacent to Green Camp at T.R. 74-A (RM 179.05). Two violations of the average D.O. criterion were documented and the mean D.O. concentration was 5.8 mg/L.

Water quality impacts from the Little Scioto River were assessed at Marion C.R. 83-F (RM 175.75). Two violations of the average D.O. criterion were documented, and the mean D.O. concentration was 5.9 mg/L. The mean concentrations of NH_3-N (0.15 mg/L), NO_x-N (2.63 mg/L) and P (0.71 mg/L) increased compared to the previous upstream site. These results indicate a significant impact, especially regarding nitrate and phosphorus. Although the Village of Green Camp is unsewered, associated impacts were likely negligible, and therefore not discernible, compared to the grossly polluted Little Scioto River (Ohio EPA 1994).

Potential impacts associated with the Village of Prospect WWTP were monitored at Thompson T.R. 183 (RM 169.25). One violation of the average D.O. criterion was documented, along with extreme variation in D.O. concentrations ($\bar{x}$=7.3 mg/L ± 2.48sd). Nutrient concentrations, though elevated, decreased compared to the previous site. These results indicate continued impact from the Little Scioto River, but likely no impact from the Prospect WWTP.

Nutrient enrichment effects from the Little Scioto River were evident at Ostrander Rd. (RM 160.38). D.O. concentrations in water quality grab samples collected here showed the highest variability of any station ($\bar{x}$ = 8.4 mg/L ± 2.84 sd), and mean BOD_5 concentration (5.1 mg/L) was the highest documented (Figure 10). Elevated P concentrations also persisted. However, no violations of Ohio WQS were documented.

Stormwater runoff from adjacent roadways likely caused water quality violations for Cu and Zn at the site adjacent S.R. 257 at I-270 (RM 145.57 - dst O'Shaughnessy Reservoir). One violation of the AAC for Cu and one violation of the AAC for Zn were documented. D.O. concentrations ($\bar{x}$ = 6.4 mg/L ± 1.07 sd) did not show a high degree of variability as previously noted suggesting some of the nutrient load associated with the Little Scioto River was assimilated by O'Shaughnessy Reservoir. The mean P concentration was reduced by one half to 0.11 mg/L.

Cottonwood Ditch

The sampling station located on Cottonwood Ditch at S.R. 195 (RM 1.46) was intended to evaluate water quality upstream from the Village of McGuffey WWTP, and potential impacts from the Village of Alger WWTP and nonpoint sources. One violation of the minimum D.O. criterion and three violations of the average D.O. criterion were documented. The mean D.O. concentration was 4.3 mg/L. Mean TSS concentrations was 90 mg/L, and the mean P concentration was 0.17 mg/L. These results indicate significant impacts from a combination of the Alger WWTP, stream channel maintenance programs, and agricultural runoff.

Severe water quality impacts associated with the Village of McGuffey WWTP were observed at RM 0.68. One violation of the minimum D.O. criterion, two violations of the average D.O. criterion, and one violation of the CAC for NH_3-N were documented. Mean concentrations of NH_3-N (1.14 mg/L), P (0.30 mg/L) and BOD_5 (7.6 mg/L) increased substantially compared to upstream.

Taylor Creek

Impacts from nonpoint sources were noted at the sampling station located on Taylor Creek at Buck T.R. 180 (RM 4.43), as one violation of the primary contact criterion for fecal coliform was documented. The source of contamination was livestock from an Amish farm accessing the creek at this site. However, nutrient concentrations were low, the D.O. concentrations were normal and showed little variation, and all BOD_5 concentrations were below the MDL suggesting nutrient enrichment from nonpoint sources was negligible.

Occidental Chemical Corporation outfall 001 effluent (RM 2.10) was evaluated for NPDES permit compliance. No permit violations were documented. The mean D.O. concentration was 6.8 mg/L; $cBOD_5$ concentrations were below the MDL; the mean NH_3-N concentration was 0.26 mg/L; the mean NO_x-N concentration was 0.13 mg/L, with 3 of 6 results below the MDL; the mean TSS concentration was 8 mg/L, with 5 of 6 results below the MDL; the mean P concentration, at 4.43 mg/L, was extremely high; the mean oil and grease concentration was 1.11 mg/L, with 5 of 6 results below the MDL; and the mean phenolics concentration was 23 μg/L, with 4 of 6 results below the MDL. These results demonstrate significant nutrient enrichment is associated with the effluent. The detection of phenolics at outfall 001 may also be a concern. This pollutant has no limits or monitoring requirements at outfall 001, although it has limits at internal outfall 601. On 14 August 1995, the phenolics concentration at outfall 001 was 84 μg/L, which exceeds the maximum concentration limit of 20 μg/L at internal outfall 601. A more detailed discussion of the

outfall 001 effluent is contained in the pollutant loadings section.

No near field (acute) impacts were detected in the Occidental Chemical Corp. outfall 001 mixing zone (RM 2.09). No violations of Ohio WQS were documented. The mean D.O. concentration was 7.0 mg/L; the mean NH_3-N concentration was 0.19 mg/L; the mean NO_x-N concentration was 0.57 mg/L, with 1 of 6 results below the MDL; the mean P concentration was 2.24 mg/L; the mean oil and grease concentration was 1.02 mg/L, with 5 of 6 results below the MDL; and the mean phenolics concentration was 13 μg/L, with 4 of 6 results below the MDL. It should be noted that on several occasions, a pink precipitate was documented on vegetation and along the stream bank in the mixing zone area.

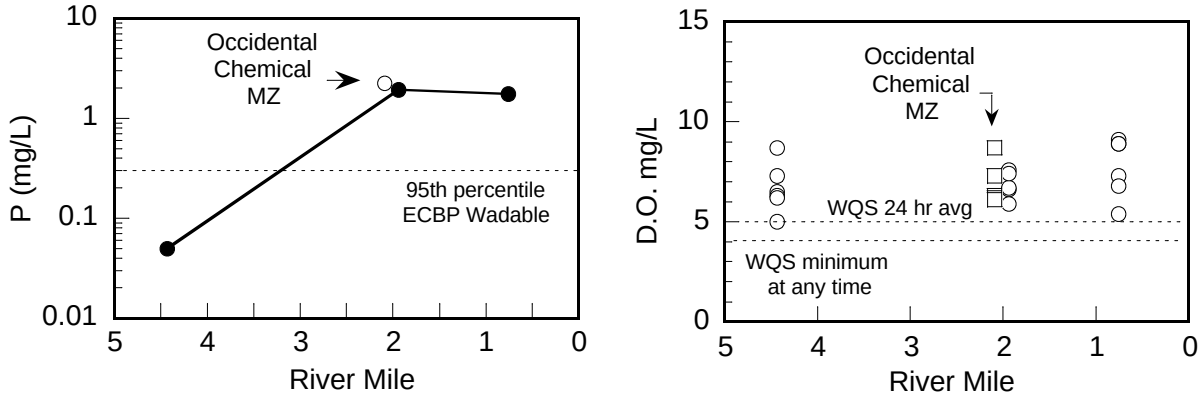


Figure 13. Mean phosphorus concentrations (left), and dissolved oxygen concentrations (right) measured in water quality grab samples collected from Taylor Creek, 1995, in relation to the Occidental Chemical Corp.

Effects of nutrient enrichment from the high levels of phosphorus and moderate levels of ammonia-nitrogen discharged by the Occidental Chemical Corp. were not manifest in either of the two sampling locations (RMs 1.94 and 0.76) downstream from the mixing zone. D.O. concentrations did not exhibit wide variations, BOD_5 concentrations were either less than the MDL or negligible. However, little phosphorus was assimilated in Taylor Creek suggesting the form discharged by Occidental was not immediately available for uptake, but was exported to the Scioto mainstem (Figure 13).

Silver Creek

One violation of the minimum D.O. criterion was documented in Silver Creek at S.R. 67 (RM 2.32) in a water quality grab sample collected when the stream was intermittent. Otherwise, measured parameters indicated good water quality and low nutrient levels.

Panther Creek

Wastewater from home sewage treatment systems upstream from and adjacent to Panther Creek at Hale T.R. 197 (RM 8.91) impaired water quality by contributing excessive nutrients to the stream (Figure 14). One violation of the minimum D.O. criterion, two violations of the average D.O. criterion, and one violation of the secondary contact criterion for fecal coliform were documented. The D.O. concentration averaged 5.4 mg/L. Ammonium concentrations averaged 0.19 mg/L, but ranged to 1.65 mg/L. The mean P concentration was 0.12 mg/L.

The Village of Ridgeway, having no centralized collection or treatment of sanitary wastewater, also impacted water quality in Panther Creek at Hardin C.R. 200 (RM 5.66). Excessive levels of ammonium were noted (Figure 14), with a mean concentration of 0.46 mg/L, and P concentrations averaged 0.21 mg/L. One violation of the minimum D.O. criterion was documented (Figure 14).

Recovery from impacts by the unsewered discharges in the Ridgeway area was documented at Hardin C.R. 219 (RM 1.80). One violation of the average D.O. criterion was documented in a sample collected when the stream was intermittent. Otherwise, nutrient levels declined to background concentrations (Figure 14).

Wildcat Creek

The sampling station located on Wildcat Creek at Hale T.R. 217 (RM 6.72) was intended to evaluate water quality impacts from the Village of Mt. Victory. The Village of Mt. Victory has no centralized collection or treatment of sanitary wastewater, though a treatment facility is planned. Wastewater from home sewage treatment systems discharge to Wildcat Creek from several storm sewers located between RM 9.4 - 9.0. One violation of the average D.O. criterion was documented. The mean D.O. concentration was 6.8 mg/L; the mean BOD_5 concentration was 2.0 mg/L, with 5 of 6 results below the MDL; the mean NH_3-N concentration was 0.06 mg/L, with 4 of 6 results below the MDL; the mean NO_x-N concentration was 1.00 mg/L, with 2 of 6 results below the MDL; the mean TSS concentration was 16 mg/L; and the mean P concentration was 0.08 mg/L, with 2 of 6 results below the MDL. These results indicate only a slight nutrient enrichment impact from Mt. Victory, although the stream likely assimilates pollutants this distance downstream from the sources.

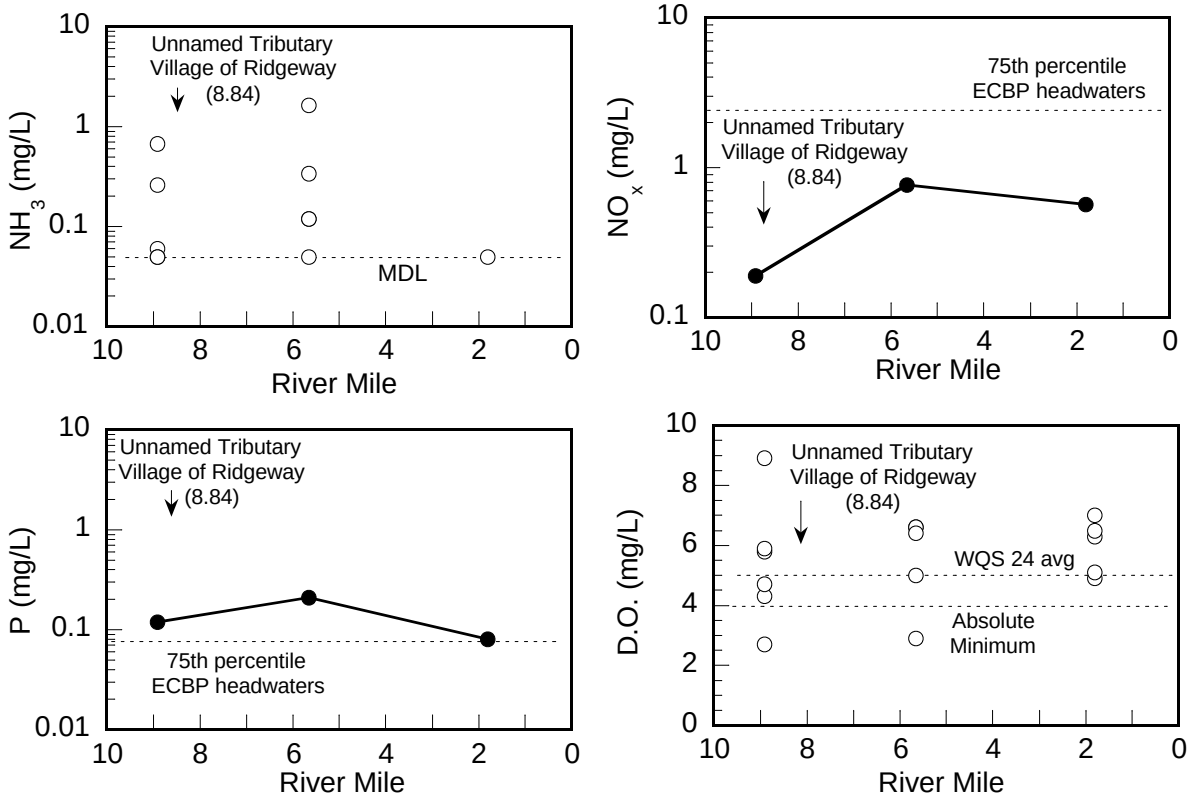


Figure 14. Ammonia-nitrogen concentrations (top left), mean nitrate-nitrite (top right), me an total phosphorus (lower left) and dissolved oxygen concentrations (lower right) measure d in water quality grab samples collected from Panther Creek, 1995 (see text for relevance of sampling locations).

The sampling station located on Wildcat Creek at Hardin C.R. 190 (RM 0.49) was intended t o evaluate water quality recovery downstream from Mt. Victory. One violation of the minimu m D.O. criterion was documented. Two exceedences of the Public Water Supply criterion for SO_4 were also documented. The mean D.O. concentration was 5.4 mg/L; the mean BOD_5 concentration was 2.5 mg/L, with 4 of 6 results below the MDL; the mean NH_3-N concentration was 0.05 mg/L, with 5 of 6 results below the MDL; the mean NO_x-N concentration was 0.75 mg/L, with 1 of 6 results below the MDL; the mean TSS concentratio n was 24 mg/L; and the mean P concentration was 0.08 mg/L, with 2 of 6 results below the MDL. These results indicate very good water quality .

Table 10. Violations of Ohio EPA Warmwater and Modified Warmwater Habitat criteria for chemical and physical parameters, violations of Primary and Secondary Contact Recreation criteria for bacteriological results, and exceedences of Water Supply criteria for chemical parameters measured in the Scioto River study area during 1995 (units are μg/L for metals, # colonies/100 ml for fecal coliforms, and mg/L for all others). Iron is not listed because 84 of 166 samples (50.1 %) violated the CAC of 1.0 mg/L.

Stream Name	River Mile	Parameter (value)
Scioto River	211.42	D.O. (4.9 ‡), Hg (1.10 **, 0.70 *, 6.00 **)
	211.39	Hg (4.0 ***)
	210.07	D.O. (4.4 ‡), fecal coliform (4400 ◊)
	207.26	fecal coliform (3600 ◊)
	192.21	D.O. (4.5 ‡, 4.4 ‡, 4.5 ‡, 4.9 ‡)
	179.05	D.O. (4.9 ‡, 4.8 ‡)
	175.75	D.O. (4.2 ‡, 4.6 ‡)
	169.25	D.O. (4.8 ‡)
	145.57	Cu (40 **), Zn (277 **)
Cottonwood Ditch	1.46	D.O. (2.7 ‡‡, 3.0 ‡, 3.9 ‡, 3.4 ‡), SO_4 (288 †, 442 †)
	0.68	D.O. (3.3 ‡, 3.1 ‡, 2.4 ‡‡), NH_3-N (3.58 *), fecal coliform (2900 ◊), SO_4 (306 †, 403 †)
Taylor Creek	4.43	fecal coliform (2400 ◊)
	1.94	SO_4 (280 †)
	0.76	SO_4 (263 †)
Silver Creek	2.32	D.O. (3.7 ‡‡)
Wildcat Creek	6.72	D.O. (4.3 ‡)
	0.49	D.O. (2.6 ‡‡), SO_4 (287 †, 360 †)
Panther Creek	8.91	D.O. (4.3 ‡, 4.7 ‡, 2.7 ‡‡), fecal coliform (5800 ◊◊)
	5.66	D.O. (2.9 ‡‡)
	1.80	D.O. (4.9 ‡)

* violation of numerical criterion for the prevention of chronic toxicity (CAC).
** violation of numerical criterion for the prevention of acute toxicity (AAC).
*** violation of numerical criterion for the prevention of lethality (FAV).
‡ violation of the average dissolved oxygen (D.O.) criterion.
‡‡ violation of the minimum D.O. criterion.
◊ violation of the primary contact recreation criterion.
◊◊ violation of the secondary contact recreation criterion.
† exceedence of the public water supply criterion.

Sediment Chemical Quality

Pollutants present in sediment create the potential for biological community impairment even where water column pollutant levels are below established criteria, and may result in continual impact on water quality and biota subsequent to elimination of pollutant loadings. Certain pollutants have toxic impacts on aquatic life and may pose a threat to human health. To evaluate chemical sediment quality in the Scioto River, Taylor Creek, and Silver Creek, ten sites were sampled to determine pollutant concentrations. Chemical analyses conducted included heavy metals (Table 11), semi-volatile organic compounds (Tables A-5 and Table A-6), and organochlorine pesticides and PCBs (Table 12). Selected parameters were ranked based on a stream sediment classification system described by Kelly and Hite (1984), and toxicity based guidelines described by Long and Morgan (1990), and Persaud et al. (1994). The Kelly and Hite (1984) classification system ranks relative pollutant concentrations, from non-elevated to extremely elevated based on deviations from mean values (metals) or percentile distribution (cadmium and organochlorine compounds). Long and Morgan (1990) defined an effects range-low (ER-L) value, which indicates the low end of the range of concentrations in which toxic effects were observed or predicted, and an effects range-median (ER-M) value, which indicates the concentration above which toxic effects were frequently or always observed or predicted among most organisms. Similarly, Persaud et al. (1994), also referred to as the Ontario guidelines, classify concentrations of metals and organochlorine compounds into no effect, lowest effect and severe effect levels based on measured or predicted toxicity to benthic organisms. Persaud et al. (1994) also present background levels of contaminants for Great Lakes sediments. Several pollutant concentrations are evaluated as a total or sum of all isomers or species detected, including: the organochlorine pesticide DDT, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

Scioto River

Analysis of sediments collected from the Scioto River at Hardin C.R. 130 (RM 213.90) indicated no significant contamination from the Hardin County Solid Waste Landfill compared to downstream sites and rankings based on Kelly and Hite (1984), Long and Morgan (1990), and Persaud et al. (1994). The sample submitted consisted primarily of silty sand. No priority organic compounds were detected, while 17 semi-volatile tentatively identified compounds (TICs) were detected (Table A-4). These compounds represent the best fit as determined by library identification. The chromium concentration was elevated, the arsenic and iron concentrations were slightly elevated, and the cadmium, copper, lead, mercury, and zinc concentrations were non-elevated (Table 11).

Sediment metals concentrations in the sample collected downstream from Taylor Creek (RM 212.77) increased slightly compared to the upstream site, suggesting Taylor Creek as the source. Additionally, the sample contained no detectable priority organic compounds, while 13 semi-volatile TICs were detected.

Table 11. Dry weight concentrations (mg/kg or ppm) of heavy metals in sediments of the Scioto River, Taylor Creek, and Silver Creek during 1995. All parameter concentrations (excluding nickel) were ranked based on a stream sediment classification system described by Kelly and Hite (1984). The Kelly and Hite classification system addresses relative concentrations but does not directly assess toxicity. Concentrations preceeded by an (*) exceeded the ER-M value described by Long and Morgan (1990). Concentrations followed by a (†) exceed the Lowest Effects Level given by Persaud et al. (1994).

RM	T-As	T-Cd	T-Cr	T-Cu	T-Fe	T-Pb	T-Hg	T-Ni	T-Zn
Scioto River									
213.90	9.73 † [b]	0.385 [a]	31.7 † [c]	16.4 † [a]	18200 [b]	<17.0 [a]	0.0505 [a]	25.5 †	70.0 [a]
212.77	10.3 † [b]	0.423 [a]	34.4 † [c]	18.5 † [a]	21100 [b]	<19.8 [a]	0.0852 [b]	27.1 †	80.0 [b]
211.42	7.40 † [a]	0.361 [a]	**44.6 † [d]**	19.0 † [a]	16900 [a]	<18.3 [a]	0.0853 [b]	28.1 †	70.0 [a]
210.07	8.41 † [b]	0.397 [a]	23.5 [c]	20.9 † [a]	19200 [b]	<20.2 [a]	**0.171 [d]**	<26.9	80.0 [b]
207.26	6.06 † [a]	0.297 [a]	24.9 [c]	13.9 [a]	20600 [b]	<18.2 [a]	0.129 [c]	<24.3	68.5 [a]
179.05	13.2 † [c]	0.684 † [b]	**62.7 † [e]**	35.1 † [a]	**37200 [d]**	<28.5	0.0942 [b]	44.6 †	**200 † [d]**
Taylor Creek									
4.43	8.99 † [b]	0.246 [a]	20.1 [b]	13.6 [a]	18800 [b]	<19.4 [a]	0.0684 [a]	<25.9	65.4 [a]
1.94	7.88 † [a]	0.272 [a]	**42.8 † [d]**	16.3 † [a]	21900 [b]	***175 † [e]**	0.128 [c]	<27.2	145 † [c]
0.76	6.44 † [a]	0.290 [a]	22.1 [b]	15.2 [a]	18200 [b]	<18.9 [a]	0.114 [c]	<25.3	80.8 [b]
Silver Creek									
2.32	11.6 † [c]	0.384 [a]	27.2 † [c]	16.0 † [a]	21100 [b]	<17.8 [a]	0.104 [c]	<23.7	82.2 [b]

[a] non-elevated; [b] slightly elevated; [c] elevated; [d] **highly elevated**; [e] **extremely elevated**

Table 12. Dry weight concentrations, by river mile, of priority organic pollutants detected in sediments of the Scioto River study area during 1995. Corrected method detection limits for non-detected (ND) pollutants, based on weight and dilution of sample, are presented in parenthesis. Selected parameter concentrations were ranked based on a stream sediment classification system described by Kelly and Hite (1984).

	River Mile				
Scioto River	**213.90**	**212.77**	**211.42**	**210.07**	**207.26**
POLYCYCLIC AROMATIC HYDROCARBONS (mg/kg or ppm)					
Benzo [B&K] Fluoranthene	ND (0.5)	ND (0.6)	0.8	ND (0.6)	ND (0.5)
Fluoranthene	ND (0.5)	ND (0.6)	1.1	0.6	ND (0.5)
Phenanthrene	ND (0.5)	ND (0.6)	0.6	ND (0.6)	ND (0.5)
Pyrene	ND (0.5)	ND (0.6)	0.8	ND (0.6)	ND (0.5)
Total PAHs	-	-	3.3	0.6	-
ORGANOCHLORINE PESTICIDES (μg/kg or ppb)					
Aldrin	ND (5.6)	ND (6.0)	ND (5.3)	20.0	ND (4.9)
Dieldrin	ND (5.6)	ND (6.0)	9.7 [c]	**12.0** [d]	**10.0** [d]

	River Mile		
Taylor Creek	**4.43**	**1.94**	**0.76**
ORGANOCHLORINE PESTICIDES (μg/kg or ppb)			
d-BHC	9.3	15.0	ND (5.3)

[a] non-elevated; [b] slightly elevated; [c] elevated; [d] **highly elevated**; [e] **extremely elevated**

Upstream from the Kenton WWTP (RM 211.42), four polycyclic aromatic hydrocarbons (PAHs) were detected and the organochlorine pesticide dieldrin was detected at an elevated concentration. Ten semi-volatile TICs were detected. Except for chromium, which was highly elevated, metal concentrations were similar to those observed upstream. These results indicate a slight impact on sediment quality from CSOs, especially regarding chromium.

Levels of both mercury and the organochlorine pesticide dieldrin, in the sample collected downstream from the Kenton WWTP (RMs 210.07) were highly elevated. Otherwise, metals

concentrations were similar to, or slightly higher than upstream. One PAH, the organochlorine pesticide aldrin, and 20 semi-volatile TICs were detected.

Concentrations of dieldrin and mercury were highly elevated, and elevated, respectively at RM 207.26. However, the number of semi-volatile TICs detected decreased to 10, concentrations of priority pollutants fell to below detectable levels, and other metals were present in concentrations similar to upstream, indicating little downstream migration of contaminated sediment.

The sampling station located on the Scioto River adjacent Green Camp T.R. 74-A (RM 179.05) was intended to evaluate ambient sediment quality and was the downstream extent of sediment analyses. The sample submitted consisted primarily of silty clay. No sample for organic analysis was submitted. The chromium concentration was extremely elevated, the iron and zinc concentrations were highly elevated, the arsenic concentration was elevated, the cadmium and mercury concentrations were slightly elevated, and the copper concentration was non-elevated. These were the highest heavy metal concentrations, excluding mercury at RM 210.07, detected on the Scioto River. This contamination is likely originating from the former B.F. Goodrich disposal site located adjacent to this sampling location.

Taylor Creek

The sampling station located on Taylor Creek at Buck T.R. 180 (RM 4.43) was intended to evaluate ambient sediment quality. The sample submitted consisted primarily of silty sand. The organochlorine pesticide d-BHC was detected, while 11 semi-volatile TICs were detected (Table A-6). The arsenic, chromium, and iron concentrations were slightly elevated and the cadmium, copper, lead, mercury, and zinc concentrations were non-elevated.

Significant sediment contamination was observed in the sample collected downstream from the Occidental Chemical Corporation (RM 1.94). Disturbing the sediments at this site resulted in an oil sheen. The sample also had a distinct latex odor and contained a pink, powdery material, as well as oily globs. The organochlorine pesticide d-BHC was detected, and 20 semi-volatile TICs were detected. Analysis of volatile organic compounds should be performed at this station due to the strong odor, and presence of semi-volatile TICs. With the exception of arsenic and nickle, concentrations of all metals increased, with lead concentration extremely elevated; chromium concentration highly elevated; and mercury and zinc concentrations were elevated. The lead concentration also exceeded the ER-M concentration of 110 mg/kg described by Long and Morgan (1990), indicating the likelihood of toxicity to the benthic community.

Little impact from Rockwell International nor accumulation of contaminated sediments from upsteam was indicated from the sample collected in Taylor Creek at S.R. 67 (RM 0.76). No priority organic compounds were detected, while 8 semi-volatile TICs were detected. Only mercury and zinc concentrations remained elevated compared to the most upstream site. Although little accumulation of contaminated sediments were present at this site, the contaminated sediments were likely migrating down to, and accumulating in, the Scioto River mainstem (see above).

Silver Creek

Ambient sediment quality was evaluated in Silver Creek at RM 2.32. No sample for organic analysis was submitted. The arsenic, chromium, and mercury concentrations were elevated, the iron and zinc concentrations were slightly elevated, and the cadmium, copper, and lead concentrations were non-elevated. These results may indicate a slight impact from nonpoint or atmospheric sources of contamination; however, the sample submitted consisted primarily of silty clay, which may have bound more metals relative to other sites sampled within the basin.

Physical Habitat for Aquatic Life

Upper Scioto River

In 1995, the physical habitat quality in the Upper Scioto River was evaluated at 19 fish sampling sites extending from upstream of Roundhead (RM 233.6) downstream to a site at I-270 (RM 145.7) upstream from Columbus. Two fairly distinct reaches were apparent (Table 13). Upstream from Hepburn, the stream has been channelized and extensively modified. Poor quality stream macrohabitats typified this upper reach with QHEI scores ranging from 65.5 at Roundhead (RM 231.7) to 23.0 at Co. Rd. 130 (RM 226.3). A mean QHEI of 43.1 was recorded for the 12 sites in this reach. The seven downstream sites yielded a mean QHEI of 71.1 with scores ranging from 89.0 at Warrensburg (RM 160.5) to 49.0 in the Prospect dam pool (RM 175.5), generally reflecting habitat conditions suitable to WWH aquatic communities (Rankin 1989).

The different distribution of habitat attributes illustrates the dichotomy between the two reaches. The physical habitat in the upper reach was dominated by attributes associated with modified streams as illustrated by the high ratio of modified habitat to warmwater habitat attributes (4.38 ±3.08 SD). Typical of modified habitats, the substrate was extensively to moderately embedded being composed of sand and silt. Very few riffles existed, currents tended to be slow, and cover was generally sparse throughout. Morphological characteristics reprsentative of modified habitats were: low sinuosity, fair to poor development, and low bed-load stability. Row crop agriculture was the principal land use with encroachment on the stream leaving only a narrow (5-10m) riparian corridor.

In the lower reach, habitat attributes characteristic of unmodified warmwater streams were generally more numerous than modified attributes as reflected in the average MWH:WWH ratio of 0.63 ± 0.42 SD. Here, gravel substrates replaced the sand and silt substrates found in the upper reach. However, silt in moderate amounts remained present at most sites with some heavy deposition in the Prospect dam pool. The amount of embeddedness varied similarly. A moderate amount of instream cover was uniform at each site. Most locations had logs, woody debris, root-wads, boulders, and deep pools. Riffle and run quality was better downstream from Kenton where increased flow resulted in better current velocity variation. Channel morphology also showed more development. Only the two most downstream locations exhibited excellent development, high sinuosity, and high stability. The lower half of the Scioto River mainstem study area had a wider (50m) riparian corridor. Adjacent land use was mostly forest interspersed by row crop fields.

Rural residential land use and pasture also increased moving downstream.

In summary, physical habitat conditions in the reach between Roundhead and Kenton, where extensive channel modifications have occurred, were considered marginally adequate to support attainment of the WWH use designation. Upstream from Roundhead and downstream from Kenton the stream has retained more natural characteristics. The probability that these reaches would support biological communities comparable to WWH expectations was considered likely (Rankin 1989).

Cottonwood Ditch

Cottonwood Ditch enters the Scioto River at RM 221.5. Physical habitat conditions were measured at the two fish sampling locations (RM 0.8 and RM 2.4) bracketing the McGuffey WWTP. The resulting mean QHEI score of 27.8 was well below expectations for supporting a WWH fauna. Extensively embedded substrates, sparse cover, extensive channel modifications and no riparian vegetation in an agricultural setting characterize the poor habitat conditions.

Silver Creek

Macrohabitats of Silver Creek were evaluated at one fish sampling site (RM 0.7) where a QHEI value of 64.5 was determined. Moderate to extensively embedded gravel and sand substrates were covered with moderate to heavy amounts of silt. A moderate amount of instream cover existed with good channel development. The WWH use designation was considered appropriate for the physical habitat conditions.

Taylor Creek

QHEI scores of 77.5 (RM 4.5), 56.0 (RM 2.0), and 46.5 (RM 0.8) were recorded at three fish sampling sites in Taylor Creek. The gravel substrate, extensively embedded by silt and sand at all sites was considered particularly limiting. Channel morphology and instream cover varied with better conditons at the upstream site and fair conditions at the downstream locations. Generally, macrohabitat quality (mean QHEI = 60.0) was suitable for a WWH biological community.

Table 13. QHEI matrix for sites sampled in the Scioto River basin, 1995.

Key QHEI Components			WWH Attributes										MWH Attributes																							
													High Influence										*Moderate Influence*													
River Mile	QHEI	Gradient (ft/mile)	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 Embeddedness	Max. Depth > 40cm	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.I. 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. Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	**Total M.I. MWH Attributes**	**MWH H.I./WWH Ratio**	**MWH M.I. WWH Ratio**
(02 -001) Scioto River																																				
233.6	50.0	6.99						■			■		2						0	▲	▲			▲	▲		▲	▲	▲	▲		8	0.33	3.00
231.7	65.5	4.59		■		■	■	■			■		5						0	▲							▲	▲	▲			4	0.17	0.83
226.3	23.0	1.50											0	●	●		●	●	4		▲		▲	▲	▲		▲	▲		▲		7	5.00	
221.9	44.0	1.02		■							■		2				●		1	▲			▲	▲			▲	▲		▲		6	0.67	2.67
220.8	25.0	1.02									■		1	●	●		●		3		▲		▲	▲			▲	▲		▲		6	2.00	5.00
216.2	39.5	1.20							■		■		4		●		●		2	▲	▲		▲	▲	▲			▲				6	0.60	1.80
213.9	32.0	3.65											0	●	●		●	●	4		▲		▲	▲			▲	▲		▲		6	5.00	
212.8	37.0	3.29									■		1	●	●		●		3		▲		▲	▲			▲	▲		▲		6	2.00	5.00
211.5	52.0	3.29		■				■			■		3				●		1	▲	▲		▲	▲			▲	▲		▲		7	0.50	2.25
211.3	45.5	1.21		■					■		■		3	●			●		2		▲		▲	▲	▲			▲	▲			6	0.75	2.25
211.2	41.0	1.21						■			■		2	●	●				2		▲		▲	▲			▲	▲		▲		6	1.00	3.00
210.1	51.0	1.21						■	■		■		3	●			●		2		▲		▲	▲				▲	▲			5	0.75	2.00
207.3	57.5	1.21		■				■			■		3						0	▲			▲	▲			▲	▲		▲		6	0.25	1.75
203.3	78.0	2.07	■	■		■	■	■	■		■		7						0		▲	▲						▲	▲			3	0.13	0.50
192.2	60.5	0.92	■	■			■	■			■		5						0		▲	▲	▲				▲	▲		▲		5	0.17	1.00
178.5	69.5	0.74	■	■		■	■	■			■		6						0		▲						▲	▲	▲			4	0.14	0.71
175.7	49.0	0.74	■	■			■	■			■		5		●				1		▲		▲				▲	▲		▲		5	0.33	1.17
169.4	63.5	2.62	■	■			■	■		■	■		6				●		1				▲	▲			▲			▲		4	0.29	0.86
160.5	89.0	5.08	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
145.7	88.0	4.33	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
(02-188) Cottonwood Ditch																																				
2.4	25.5	2.05									■		1	●			●	●	3		▲		▲	▲	▲		▲	▲		▲		7	2.00	5. 5 0
0.8	30.0	2.05									■		1	●	●	●	●		4		▲		▲	▲			▲	▲		▲		6	2.50	5.50
(02-181) Taylor Creek																																				
4.5	77.5	7.14	■	■		■	■	■	■		■		7						0		▲							▲	▲			3	0.13	0.50
2.1	61.5	5.10	■	■		■	■	■	■		■		7		●	●			2		▲			▲	▲			▲	▲			5	0.38	1.00
2.0	56.0	5.10	■	■			■	■	■		■		6		●	●			2		▲			▲	▲			▲	▲			5	0.43	1.14
0.8	46.5	16.67	■	■			■				■		4		●	●			2		▲			▲	▲		▲	▲		▲		6	0.60	1.80
(02-182) Silver Creek																																				
2.4	64.5	10.53	■	■		■	■	■			■		6			●			1		▲						▲	▲	▲			4	0.29	0.86

Table 13. Continued.

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 Embeddedness	Max. Depth > 40cm	Low/No Riffle Embeddedness	**Total WWH Attributes**	MWH Attributes – *High Influence*: Channelized or No Recovery	Silt/Muck Substrates	Low Sinuosity	Sparse/No Cover	Max. Depth < 40 cm (WD/HW)	**Total H.I. MWH Attributes**	MWH Attributes – *Moderate Influence*: 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. Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	**Total M.I. MWH Attributes**	**MWH H.I./WWH Ratio**	**MWH M.I. WWH Ratio**
(02-175) Panther Creek																																		
9.0	66.5	11.90	■	■		■	■	■	■		■		0						0		▲								▲	▲		3	0.13	0.50
5.7	73.5	12.20	■	■		■	■	■			■		0						0		▲							▲	▲	▲		4	0.14	0.71
1.9	81.0	6.10	■	■		■	■	■	■		■		7						0		▲								▲	▲		3	0.13	0.50
(02-172) Wildcat Creek																																		
6.8	28.0	8.77		■							■		2	●	●	●	●		4		▲			▲	▲			▲	▲	▲	▲	7	1.67	4.00
0.6	50.0	6.02	■				■	■			■		4			●		●	2		▲			▲				▲	▲	▲	▲	6	0.60	1.80

Panther Creek

The best overall habitat conditions encountered during the 1995 Upper Scioto River survey occurred in Panther Creek with a mean QHEI of 73.7 for three fish sampling sites. A variety of substrates existed at all stations, though silt from nonpoint run-off resulted in significant embeddedness. Extensive to moderate amounts of instream cover with good morphology and riparian corridor characterized these sites.

Wildcat Creek

The physical habitat conditions of Wildcat Creek were measured at the two fish sampling sites. The upstream site was an agricultural drainage ditch where a QHEI score of 28.0 (RM 6.8) reflected the lack of instream cover, a straight channel and the absence of riparian vegetation. The site near the mouth was downstream from a reach where the stream was flanked by several cattle pastures. The extent of the false banks and degree of gross habitat impairment influenced by the cattle through this reach was among the most significant observed in the state by the Ohio EPA. Despite these upstream influences a QHEI score of 50.0 (RM 0.6) was recorded at the downstream location. Although the substrates were degraded, moderate instream cover and essentially natural channel conditions prevailed. Overall, the macrohabitats in Wildcat Creek were considered marginal for the WWH use designation.

Biological Assessment: Macroinvertebrate Communities

Scioto River

Macroinvertebrate communities were evaluated at 19 stations on the Scioto River from upstream of Roundhead in southwest Hardin County (RM 234.3) to upstream of I-270 (north) in Franklin County (RM 145.8) (Table 14, Figure 15). The Invertebrate Community Index (ICI) scores ranged from 56 (exceptional) upstream from Cottonwood Ditch (RM 222.8) and downstream from Rodger Road (RM 216.6) to a low of 20 (fair) downstream from the Little Scioto River (RM 177.2) in an area impounded by the low-head dam in Prospect. The station with the highest total mayfly (Ephemeroptera), stonefly (Plecoptera), and caddisfly (Trichoptera) taxa richness (EPT), a measure of the diversity of pollution sensitive taxa, was at CR 130 (RM 213.9) with 26 taxa. Overall, the macroinvertebrate communities were evaluated as very good or exceptional at 15 sites, good at two sites, and fair at two sites.

Macroinvertebrate taxa collected in the Scioto River indicative of high stream quality included the mayfly *Acerpenna macdunnoughi* at RMs 234.3 and 231.8, stoneflies of the *Agnetina capitata* complex at RMs 160.5 and 145.8, the caddisfly *Helicopsyche borealis* at four stations between RMs 234.3 and 213.9, and midges of the *Rheotanytarsus distinctissimus* group at RMs 231.8, 216.6, 213.9, and 160.5. Twelve species of freshwater mussels (Unionidae) were found in the Scioto River within Hardin County (Table 15). Nationwide, freshwater mussels have declined dramatically due to anthropogenic activities, so that currently 71.7% of the 297 Nearctic species are considered extinct, endangered, threatened, or of special concern (Williams et al. 1993). Four to ten species were present at nine of the thirteen stations sampled within Hardin County. Only the two stations bracketing the town of Roundhead and the two stations downstream from the Kenton WWTP were devoid of unionids. Unionids were not commonly encountered at the Scioto River stations downstream from Hardin County. None of the species extant in the Scioto River were federally or state listed, but several weathered shells of the federally and state listed endangered species *Pleurobema clava* (clubshell) were found at TR 245 (RM 201.3), demonstrating their past presence.

The unsewered community of Roundhead was not noticeably impacting the macroinvertebrate community. Macroinvertebrate communities evaluated upstream (RM 234.3) and downstream (RM 231.8) from Roundhead were both achieving exceptional ICI scores of 50. The confluence of Cottonwood Ditch (RM 221.5), which receives the McGuffey WWTP discharge at RM 1.1, was not noticeably impacting the macroinvertebrate communities either. The ICI scored exceptional upstream (ICI=56 and 50 at RM 222.8) and downstream (ICI=50 at RM 220.8) from Cottonwood Ditch and remained in the exceptional range downstream to Kenton. Downstream from the Roundhead area the Scioto River has been channelized for much of its length within Hardin County with varying degrees of recovery. The area around Cottonwood Ditch probably demonstrates the least amount of recovery with a straight channel, typical lack of riffle development, and the woody riparian kept off at least one of the banks. Two artificial substrate samplers were placed at RM 222.8 to evaluate the effect of slow current on the ICI score within

the Scioto River. The A sample (ICI=56) was placed downstream from a riffle in an area with optimal current speed and the B sample (ICI=50) was placed in a slow current area which is more typical for this part of the river. The B sample lost six ICI points for declines in the diversity and abundance of the caddisfly component of the community. This decline is expected considering that the most diverse and abundant group of caddisflies usually associated with artificial substrate samplers in free flowing rivers (lotic habitat) are the hydropsychids which feed by filtering food suspended in the water column with silk nets. Filter feeding organisms rely on water flow for their food supply and therefor are primarily restricted to areas of the stream with sufficient flow (rheophilic organism). The fact that this sample and others located in channelized, slow current areas of the Scioto River scored in the exceptional range demonstrates the high quality of these macroinvertebrate communities and the potential for the entire aquatic resource.

The macroinvertebrate monitoring station located at and downstream from the CR 130 bridge was immediately downstream from the Hardin County Landfill. The community performance (ICI=48 at RM 213.9) at this station did not indicate any impact from the landfill. In fact, this station had the highest diversity of any of the stations sampled during this study with 61 quantitative sample taxa, 75 qualitative sample taxa, 26 total EPT taxa, and 10 freshwater mussel taxa.

The confluence of Taylor Creek (RM 213.07), which receives discharges from Occidental Chemical (RM 2.1) and Rockwell International (RMs 1.35, 1.26), was not noticeably impacting the macroinvertebrate community. The ICI scored exceptional upstream (ICI=48 at RM 213.9) and downstream (ICI=50 at RM 212.8) from Taylor Creek. Additionally, no impacts were apparent from the Kenton CSOs, which enter the Scioto River from RM 212.50 to RM 211.41. The ICI score (46) remained in the exceptional range at RM 211.5.

The macroinvertebrate community was significantly impacted downstream from the Kenton WWTP (RM 211.40). The community response within the mixing zone was characteristic of organic pollution without any significant indication of effluent toxicity. The diversity of EPT taxa declined to 8 and 9 (compared to 13-25 at upstream sites) and the abundance of organic pollution tolerant taxa increased, especially midges of the genus *Chironomus*. Both qualitative samples within the mixing zone were evaluated as fair, however, by the second sample (taken on September 12) sewage solids had increased dramatically compared to the earlier sample and red midges of the *Chironomus riparius* group had become the predominant organism. *Chironomus* larvae are highly tolerant to low dissolved oxygen concentrations and thus often become abundant in areas of high organic loadings.

The community performance downstream from the Kenton WWTP and outside of the mixing zone dropped to the good range (ICI=36 at RM 211.3) from an exceptional evaluation upstream (ICI=46 at RM 211.5). The drop in ICI score was due to an increase in the abundance of pollution tolerant taxa (13.8% compared to 1.1% at RM 211.5) and the non-Tanytarsini Diptera and non-insects (52.3% compared to 7.5% at 211.5) without a significant decline in diversity.

Table 14. Summary of macroinvertebrate data collected from artificial substrates (quantitativ e sampling) and natural substrates (qualitative sampling) in the Scioto River stud y area, 1984 - 1995. Mixing zone samples are italicized.

			Quantitative Evaluation				
Stream River Mile	Density (#/ft^2)	Quant. Taxa	Qual. Taxa	Qual. EPT[a]	Total EPT[a]	ICI	Evaluation[b]
Scioto River (1995) (WWH existing)							
234.3	604	41	53	17	22	50	Exceptional
231.8	697	49	60	13	17	50	Exceptional
222.8A	476	49	59	22	25	56	Exceptional
222.8B	336	50	-	-	-	50	Exceptional
220.8	335	47	58	17	19	50	Exceptional
216.6	572	45	58	19	24	56	Exceptional
213.9	342	61	75	25	26	48	Exceptional
212.8	273	53	52	14	20	50	Exceptional
211.5	549	50	56	13	19	46	Exceptional
211.39A[c]	-	-	*34*	*8*	-	-	*Fair*
211.39B[c]	-	-	*42*	*9*	-	-	*Fair*
211.3	673	49	51	12	16	36	Good
210.1	715	49	70	22	24	44	Very Good
207.7	1046	51	63	16	20	48	Exceptional
201.3	812	47	70	19	23	48	Exceptional
192.2	418	29	45	12	15	46	Exceptional
179.6	350	35	37	13	18	44	Very Good
177.2[d]	147	28	25	3	4	20*	Fair
169.2	1403	34	54	16	20	50	Exceptional
160.5	1281	37	46	15	18	48	Exceptional
145.8	952	26	45	15	17	38	Good
Scioto River (1987)							
179.6	465	31	52	13	-	48	Exceptional
178.4	357	31	38	11	-	38	Good
176.8	184	28	33	5	-	26	Fair

Table 14. (continued).

			Quantitative Evaluation				
Stream River Mile	Density (/ft^2)	Quant. Taxa	Qual. Taxa	Qual. EPT[a]	Total EPT[a]	ICI	Evaluation[b]
Scioto River (1984)							
221.6	133	25	18	2	4	18	Fair
220.1	395	24	16	3	4	20	Fair
216.7	273	37	40	13	16	40	Good
212.5	388	21	29	5	8	18	Fair
211.4	397	31	34	6	7	22	Fair
210.1	525	38	36	12	15	32	Marg. Good
207.7	341	30	38	9	11	22	Fair
203.3	1380	35	35	8	13	38	Good
Cottonwood Ditch (1995) (MWH existing)							
2.5	190	41	39	3	5	28	Fair
0.7	859	38	45	5	7	28	Fair
Cottonwood Ditch (1984)							
2.4	-	-	25	5	-	-	Marginally Good
0.7	-	-	12	0	-	-	Poor
Taylor Creek (1995) (WWH existing)							
4.5	300	49	72	22	22	56	Exceptional
2.1[c]	-	-	*39*	*12*	-	-	*Good*
2.0	275	31	57	14	14	50	Exceptional
0.7	310	37	38	10	10	34[ns]	Marginally Good
Taylor Creek (1984)							
4.4	-	-	45	9	-	-	Good
1.4	-	-	28	6	-	-	Marginally Good
0.8	-	-	21	4	-	-	Poor
Silver Creek (1995) (WWH existing)							
2.3	123	31	59	13	14	28[e]	Good

Table 14. (continued).

Quantitative Evaluation							
Stream River Mile	Density (/ft^2)	Quant. Taxa	Qual. Taxa	Qual. EPT[a]	Total EPT[a]	ICI	Evaluation[b]
Wildcat Creek (1995) (WWH existing)							
6.7	-	-	37	5	-	-	Fair
0.5	78	35	37	8	11	36	Good

Qualitative Evaluation					
Stream River Mile	No. Qual. Taxa	Qual. EPT[a]	Relative Density	Predominant Organisms	Narrative Evaluation
Scioto River (1995) (WWH existing)					
211.39A[c]	34	8	Moderate	Mayflies, limpet snails, midges	Fair
211.39B[c]	42	9	High	Red midges	Fair
Taylor Creek (1995) (WWH existing)					
2.1[c]	39	12	Mod.-Low	Hydropsychid caddisflies, mayflies, midges	Good
Silver Creek (1995) (WWH existing)					
2.3	59	13	Mod.-Low	Hydropsychid caddisflies, mayflies, midges	Good
Panther Creek (1995) (WWH existing)					
8.9	45	10	Mod.-Low	Mayflies, midges	Good
5.7	42	12	Moderate	Hydropsychid caddisflies, baetid mayflies, midges	Good
1.8	35	8	Mod.-Low	Heptageniid mayflies, midges, crayfish	Marg. Good
Wildcat Creek (1995) (WWH existing)					
6.7	37	5	High	Hydropsychid caddisflies	Fair
0.5	37	8	Low	Hydropsychid caddisflies, riffle beetles	Good

* Significant departure from ecoregion biocriterion (>4 ICI units); poor and very poor results are underlined.

ns Nonsignificant departure from biocriterion (≤4 ICI units).

a EPT = total Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) taxa richness.

b A qualitative narrative evaluation based on best professional judgement is used when quantitative data is not available to calculate the Invertebrate Community Index (ICI) scores.

c Mixing zone sampling location.

d The sampling location was located within an impoundment with non-detectable current speed.

e The quantitative (artificial substrate) sample was affected by slow current speed and the evaluation was based primarily on the qualitative (natural substate) sampling results.

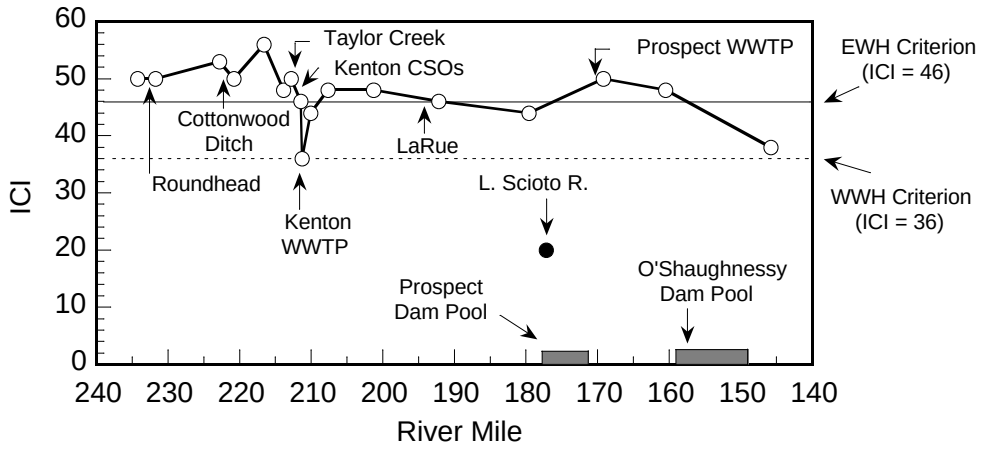


Figure 15. Longitudinal plot of Invertebrate Community Index (ICI) scores for sites sampled in the upper Scioto River mainstem, 1995, in relation to select tributaries, point source discharges, and important physical features.

Table 15. Distribution of freshwater mussels (Unionidae) in the Scioto River within Hardi n County during the 1995 sampling effort.[a]

	River Mile												
Species	234.3	231.8	222.8	220.8	216.6	213.9	212.8	211.5	211.39	211.3	210.1	207.7	201.3
Alasmidonta marginata						X							
Amblema plicata			X	X	X	X		X			X		X
Anodontoides ferussacianus				X								X	
Elliptio dilatata													X
Fusconaia flava						X	X	X					
Lampsilis radiata luteola			X	X	X	X	X	X				X	X
Lampsilis ventricosa						X							
Lasmigona comlanata				X	X	X	X	X			X	X	X
Lasmigona costata					X	X		X			X	X	X
Ptychobranchus fasciolaris						X							
Pyganodon grandis			X	X	X	X	X	X			X	X	X
Strophitus undulatus				X		X		X			X	X	
Number of species	0	0	4	5	5	10	4	7	0	0	6	5	6

[a] Taxa were considered present at a station if fresh-dead specimens were collected or if live specimens were observed in the field.

This community response was indicative of organic loadings. The sewage solids prevalent within the mixing zone were not observed at this station. The macroinvertebrate community performance improved to the very good range by CR 175 (ICI=44 at RM 210.0) and exceptional by CR 195 (ICI=48 at RM 207.7). However, the abundance of pollution tolerant taxa remained slightly elevated (5.8% at RM 210.1 and 5.3% at RM 207.7) until TR 245 (0.5% at RM 201.3).

No noticeable impacts to the macroinvertebrate community were attributed to the unsewered community of LaRue. The ICI scored exceptional upstream (ICI=48 at RM 201.3) and downstream (ICI=46 at RM 192.2). However, there were declines in the diversity measurements of quantitative sample total taxa (from 47 to 29), mayfly taxa (from 13 to 9), dipteran taxa (from 24 to 12), and qualitative sample EPT taxa (from 19 to 12).

The macroinvertebrate community performance downstream from the unsewered community of Green Camp and the confluence of the Little Scioto River (RM 177.35) declined to the fair range (ICI=20 at RM 177.2) compared to very good (ICI=44 at RM 179.6) upstream from Green Camp. The Scioto River in this area is impounded by a low-head dam in the village of Prospect. The impounded river condition was likely the primary limiting factor for the community. The most common taxa on the artificial substrates was the mayfly genus *Stenacron* which is a common inhabitant in the slow water areas along the margins of streams this size. However, representatives of several slow current types of caddisflies expectedt were completely absent. The Little Scioto River has historically had severe PAH and heavy metal sediment contamination and heavy metal and low DO water column violations originating from the Marion area (Ohio EPA 1988, 1994) which may also be having a negative effect on the biological integrity in the Scioto River. Another possible source of heavy metal contamination in the sediments was the former B.F. Goodrich disposal site located adjacent to the water chemistry site located adjacent to Green Camp at RM 179.05 where sediment concentrations of chromium and zinc were extremely and highly elevated, respectively.

The village of Prospect WWTP (RM 170.95) was not noticeably impacting the macroinvertebrate community performance. The ICI score of 50 at RM 169.2 was in the exceptional range.

The macroinvertebrate community performance downstream from the O'Shaughnessy Dam (dam pool from RM 156.0 to 148.9) declined to the good range (ICI=38 at RM 145.8) compared to exceptional (ICI=48 at RM 160.5) upstream from the reservoir. The decline was primarily due to a decline in dipteran diversity and an unusually high number of flatworms (Turbellaria). This decline may in part be due to flow regulations by the O'Shaughnessy Dam which decrease the intensity during high flows and reduces the flow during low flow.

Cottonwood Ditch

Macroinvertebrate communities were sampled in Cottonwood Ditch to evaluate any impact from the McGuffey WWTP (RM 1.1). Cottonwood Ditch's aquatic life use designation is Modified Warmwater Habitat (MWH) due to extensive channel modifications (channelized stream bed)

which show little recovery. The macroinvertebrate community sampled upstream from the McGuffey WWTP at T 55 (RM 2.5) was definitely limited by the poor stream habitat. The ICI (28) scored in the fair range with low diversity of the EPT taxa (5 total EPT taxa). The community was predominated by beetles, scuds and aquatic segmented worms. This ICI score is above the MWH biocriterion of 22. A note of interest at this site was the collection of the pondhorn freshwater mussel (*Uniomerus tetralasmus*) for the first time by the Ohio EPA. Pondhorns prefer ponds and slow, small streams with silty substrates. The macroinvertebrate community performance downstream from the McGuffey WWTP was evaluated as fair (ICI=28 at RM 0.7) with increases in the abundance of flatworms (Turbellaria), midges, and aquatic segmented worms. The abundance and diversity of EPT taxa (7 total EPT taxa) remained low. This station is located in an area with good riffle development which, although atypical for the stream as a whole, is expected to have higher community performance. This station was achieving the MWH use designation but the community response indicated a biological integrity impairment from organic loadings.

Taylor Creek

Macroinvertebrate communities were sampled in Taylor Creek to evaluate any impairment from the Occidental Chemical Corp. (RM 2.1) and Rockwell International (RMs 1.35 and 1.26) discharges (Figure 16). The community upstream from the industries (RM 4.5) was performing at the exceptional level with an ICI score of 56. Taxa collected at this station usually associated only with high quality streams were the caddisfly *Helicopsyche borealis* and midges of the *Rheotanytarsus distinctissimus* group. The macroinvertebrate community response within the Occidental Chemical Corp. mixing zone (RM 2.1) did not indicate a toxic impact. The qualitative sample EPT (12) was within the expected range for a WWH stream and pollution intolerant or intermediate groups were observed to predominate the community. Downstream from the mixing zone at RM 2.0, the community was evaluated as exceptional with an ICI score of 50. The primary difference compared to the upstream station (RM 4.5) was a decline in the diversity of the quantitative sample (from 49 to 31 taxa), the qualitative sample (from 72 to 57 taxa), and the total EPT (from 22 to 14 taxa). The two taxa associated with high quality streams collected at the upstream station were not found downstream from the Occidental Chemical Corp. Though measurable, impact on the macroinvertebrate community from Occidental Chemical Corp. at this station was considered minor given the exceptional community present.

The macroinvertebrate community performance downstream from the Rockwell International discharges dropped to the marginally good range (ICI=34 at RM 0.7) due to a general decline in the diversity and proportion of pollution intolerant groups and a slight increase in tolerant taxa. These community changes are likely due to far field nutrient enrichment impact from high phosphorus concentrations from Occidental Chemical. The Rockwell International discharges were tied into Kenton's sanitary sewer system on 30 August 1995.

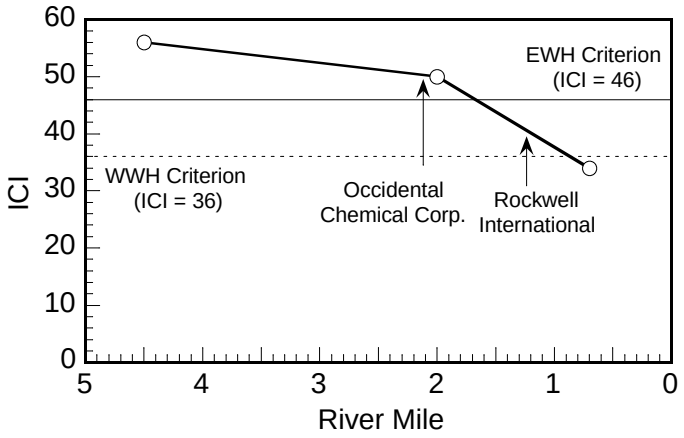


Figure 16. Invertebrate Community Index (scores) for sites sampled in Taylor Creek, 1995, in relation to the Occidental Chemical Corp. and Rockwell International.

Silver Creek

The Silver Creek station located downstream from SR 67 (RM 2.3) is a regional reference site and was included in this study as part of a continuing effort to periodically resample reference sites. The ICI (28) scored in the fair range due to the absence of caddisflies (caused by the artificial substrates ending up in non-detectable current due to flow reduction during the sampling period) and elevated abundance of tolerant taxa (24.5%). However, the qualitative sample EPT taxa diversity (13) and the taxa observed to be predominant during qualitative sampling were consistent with WWH expectations. Therefore, this site was evaluated as good based on the qualitative sample.

Panther Creek

Macroinvertebrate communities were sampled at three stations in Panther Creek using qualitative methods to evaluate any impact from agricultural land uses and the unsewered community of Ridgeway. The communities upstream (RM 8.9) and downstream (RM 5.7) from the tributary that receives the unsewered Ridgeway runoff were meeting WWH expectations for EPT taxa diversity (10 taxa at RM 8.9 and 12 taxa at RM 5.7). Stream flow was probably more limiting than the unsewered discharge, as flows at the time of collection (6 September) were intermittent at the upstream station and interstitial to very low at the downstream station. Community performance declined slightly at the station located upstream from CR 219 (RM 1.8). The EPT taxa diversity (8 taxa) declined to only marginally meeting WWH expectations, reflecting latent impact from nutrient loadings by the Village of Ridgeway. Agricultural and livestock runoff

within the basin appear to have an impact on macroinvertebrate performance by raising ambient nutrient levels.

Wildcat Creek

Macroinvertebrate communities were sampled at two stations in Wildcat Creek to evaluate any impact from the unsewered community of Mt. Victory. The community located 2.7 mi downstream from Mt. Victory at RM 6.7 was performing below the WWH expectations for EPT taxa diversity (5 taxa); an evaluation of fair was given to the overall community. Unlike Panther Creek, Wildcat Creek had moderate flow at the time of sampling (6 September), possibly due to septic and other inputs from Mt. Victory. Runoff from Mt. Victory was probably the major source of the below expected performance at this station. Community performance improved to the good range (ICI=36, EPT=8 at RM 0.5) at LaRue-Kenton Road. During the summer of 1995 a wastewater collection system was under construction for Mt. Victory which will discharge to Panther Creek when completed.

Biological Assessment: Fish Community

Scioto River

Fifty two species and four hybrid types of fish (16,272 individuals) were collected in the Scioto River in 1995. Sampling occurred twice at 12 wading sites; upstream from Roundhead (RM 233.6) to downstream from Kenton (RM 207.3) and three times at 7 boat sites; from Hepburn (RM 203.3) to I-270 (RM 145.7) upstream from Columbus. Overall, the fish assemblage in the Scioto River marginally met expectations for Warmwater Habitat (Table 16). This characterization was based on fish community indices which ranged from poor-fair (MIwb=5.4; IBI=27 at RM 175.7) to exceptional-very good (MIwb=9.7; IBI=44 at RM 203.3). Including all sites, the mean wading MIwb was 7.9 and the mean boat MIwb was 8.6. The mean wading IBI was 39.0. The mean boat IBI was 38.4 (Figure 17).

Severe physical habitat limitation ($\bar{x}$ QHEI = 41.5 ± 15.9sd) at the five upper most mainstem sites upstream from RM 216.2, prevented fish communities from meeting WWH criteria at four of five sites. Downstream from RM 216.2, gradient increased, and although overall habitat quality increased only slightly, QHEI scores were less variable ($\bar{x}$ QHEI = 44.8 ± 7.9sd), allowing fish communities to improve and generally meet WWH criteria.

At sites downstream from Hepburn (RM 207) more natural stream habitat attributes (mean QHEI = 71.1), excluding the Prospect dam pool, resulted in a slight longitudinal improvement in fish community performance as measured by the MIwb. However, IBI scores remained similar to or declined slightly from the previous reach (RM 216 - 207), suggesting water quality impacts.

Individual IBI metric scores corresponded with the physical habitat inadequacies. Tolerant and omnivorous species generally composed the highest proportion of all fishes, especially at sites with the lowest gradients. The upper portion of the survey area is extensively modified, and much

of the lower portion (except the most downstream sites) is a low gradient stream. The number of sucker species, the percentage of round bodied suckers, and the percentage of simple lithophiles typically scored in the moderate range. These metrics were considered indicative of the poor riffle run quality and fair substrate quality. The number of sunfish species and proportion of top carnivores increased at sites with relatively higher gradients, resulting in higher IBI scores at those sites.

In 1995, the Kenton WWTP did not have a negative impact on fish community performance in the near field sample (Figure 17). Two mixing zone samples were collected with no indication of toxicity or avoidance (MIwb=9.2, IBI=41). Nine CSO's enter the stream immediately upstream from the plant between RM 212.5 and RM 211.4. A slight decline in index scores from good (MIwb=8.3, IBI=43) to marginally good (MIwb=8.0, IBI=39) through this reach was consistent with the type of impact often associated with a CSO (*i.e.*, increased omnivory and a higher incidence of DELT anomalies). However, the decline was marginal, suggesting overflows were confined to high flow events, and were not discharging during dry weather. Fish community performance did, however, decline in the far field sample at RM 207.3 to nonsignificant departure from the WWH criteria, coinciding with the increasingly variable D.O. concentrations observed downstream from the WWTP.

The site at RM 175.7 within the Prospect dam pool, was downstream from the confluence with the Little Scioto River. The poorest fish community performance (MIwb=5.4, IBI=27) recorded in the 1995 study area occurred here. The Little Scioto River is heavily contaminated with various PAHs, metals and cyanide (Ohio EPA 1994), and contributes substantial amounts of nutrients to the Scioto River mainstem (Ohio EPA 1994, see also the preceding *Chemical Water Quality* section). Effects of habitat on fish community performance created by the dam pool (QHEI=49.0), were evident in the reduced proportion of round-bodied suckers and simple lithophiles. Evidence for water quality impacts imparted by the Little Scioto River was given by the 80% reduction in relative number of non-tolerant fishes, and increased incidence of deformity, erosion, lesion and tumor (DELT) anomalies. The need for a dam at Prospect is questioned.

In summary, in 1995 the Scioto River supported a marginally good fish community with fair assemblages noted upstream from Kenton and in the Prospect dam pool. The marginal to fair performance was principally affected by channel modifications in the upper reach. The Kenton WWTP was not considered a factor in the overall lackluster performance. Given the typically poor quality macrohabitat conditions of the upper reach of the Scioto River, it is difficult to foresee improvements in fish community performance beyond minimal ecoregional expectations.

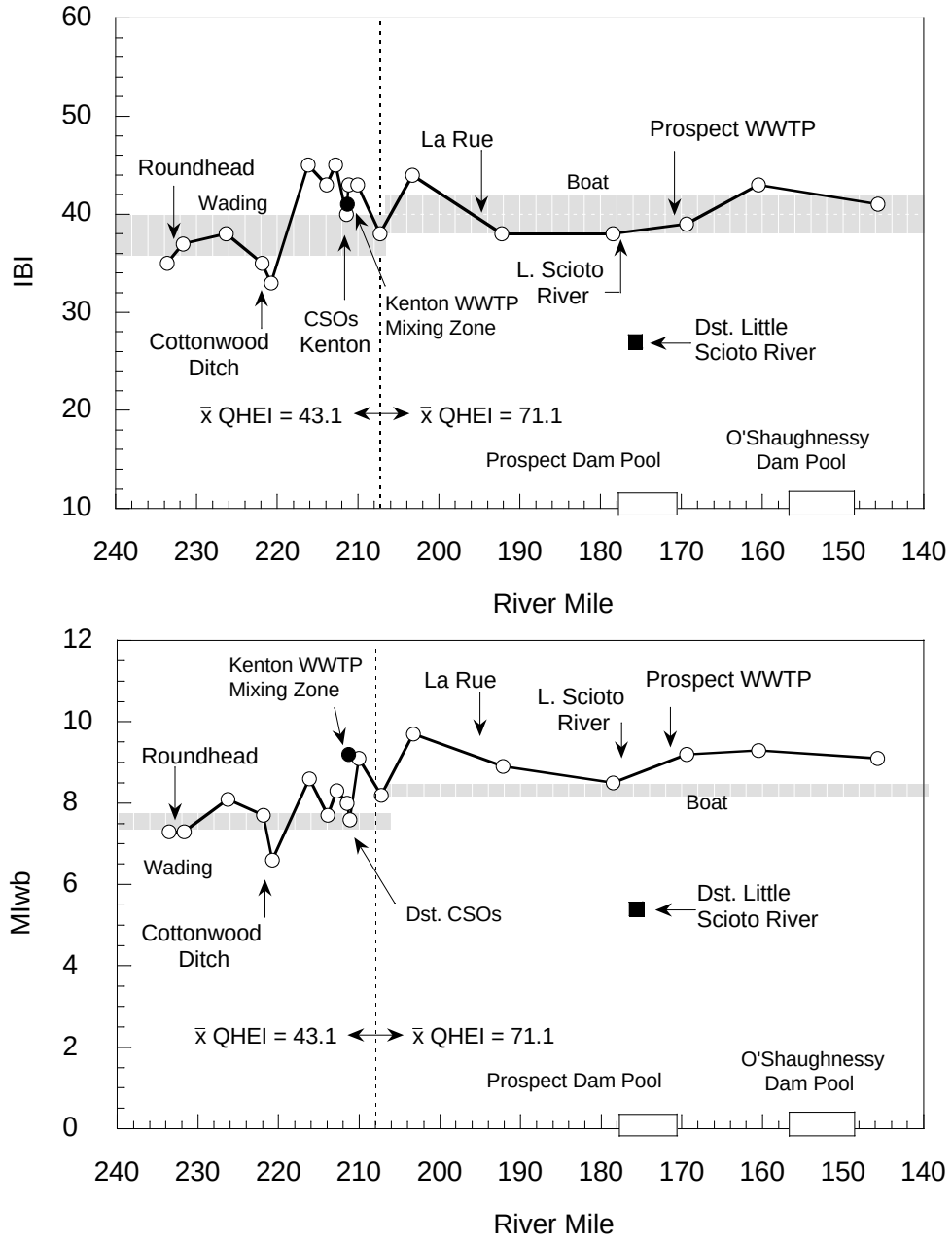


Figure 17. Longitudinal plots of Index of Biotic Integrity (IBI) scores (top) and Modified Index of Well-being (MIwb) values (bottom) for sites sampled in the upper Scioto River mainstem, 1995, in relation to select tributaries, point source discharges, and important physical features. The shaded region in each plot represents the area of nonsignificant departure.

Table 16. Fish community indices based on pulsed D.C. electrofishing samples collected b y Ohio EPA within the upper Scioto River study area 1979-1995.

River Mile	Mean Number Species	Cumulative Species	Mean Rel. No (No./0.3 km)	Mean Rel. Wt. (kg/0.3 km)	QHEI	Mean Miwb[a]	Mean IBI	Narrative Evaluation
Upper Scioto River (1995 Eastern Corn Belt Plains WWH Use Designation) (Existing)								
233.6	20.0	26	804.5	7.6	50.0	7.3*	35*	Fair
231.7	21.0	23	976.3	23.1	65.5	7.3*	37ns	Fair -M. Good
226.3	26.0	28	761.3	10.7	23.0	8.1ns	38ns	Marginally Good
221.9	24.5	29	312.0	37.2	44.0	7.7*	35*	Fair
220.8	19.5	25	255.0	26.5	25.0	6.6*	33*	Fair
216.2	28.0	32	625.5	19.6	39.5	8.6	45	Good
213.9	23.5	30	236.6	9.0	32.0	7.7*	43	Fair- Good
212.8	25.5	32	450.0	23.4	37.0	8.3	45	Good
211.5	25.5	30	609.0	66.7	52.0	8.0ns	40	M. Good- Good
211.3	*20.0*	*23*	*1056.0*	*69.8*	*45.5*	*9.2*	*41*	*V. Good- Good*
211.2	25.0	29	447.8	34.0	41.0	7.6*	43	Fair- Good
210.1	27.0	31	1140.8	14.7	51.0	9.1	43	V. Good- Good
207.3	23.0	28	302.5	22.5	57.5	8.2ns	38ns	Marginally Good
203.3	25.0	31	1190.7	284.2	78.0	9.7	44	Excep.- V. Good
192.2	21.7	30	687.3	102.7	60.5	8.9	38ns	Good- M. Good
178.5	23.5	28	462.0	75.2	69.5	8.5	38ns	Good- M. Good
178.5	34	34	1074.0	51.1	69.5	9.1	40	V. Good- Good
175.7	16.0	22	208.0	117.4	49.0	5.4*	27*	Poor- Fair
169.4	24.3	33	559.3	133.0	63.5	9.2	39ns	V.Good- M.Good
160.5	19.3	24	570.7	138.3	89.0	9.3	43	V. Good- Good
145.7	17.0	25	770.0	174.1	88.0	9.1	41	V. Good- Good
Scioto River 1992								
145.5A	21.0	21	1252.0	103.4	83	10.4	46	Excep.-V. Good
Scioto River 1991								
161.7D	25.0	25	1771.5	33.1	--	9.0	38ns	V.Good-M. Good
160.3A	18.0	18	2434.3	210.6	72	9.8	34*	Excep.- Fair
158.3D	20.0	20	1576.5	27.7	--	8.7	32*	Good- Fair
157.1A	21.0	21	1805.4	45.1	74	9.0	34*	Good- Fair
Scioto River 1990								
155.4	13.0	13	484.0	37.6	--	7.9*	32*	Fair
149.3	8.0	8	268.0	32.6	--	6.5*	20*	Fair- Poor
140.0	7.0	7	670.0	84.7	--	7.8*	26*	Fair

Table 16. Continued.

River Mile	Mean Number Species	Cumulative Species	Mean Rel. No (No./0.3 km)	Mean Rel. Wt. (kg/0.3 km)	QHEI	Mean Miwb[a]	Mean IBI	Narrative Evaluation
Scioto River 1988								
166.7	18.0	24	309.0	66.3	--	7.1*	28*	Fair
Scioto River 1987								
179.6	23.3	32	321.3	117.8	66	7.7*	33*	Fair
178.7	28.0	34	359.2	143.3	68	8.3	35ns	Fair- M. Good
177.0	12.7	19	122.0	70.2	42	4.6*	25*	V. Poor- Poor
Scioto River 1984								
221.8A	17.0	19	264.6	47.5	49	6.4*	22*	Fair- Poor
220.8A	15.5	19	181.0	31.6	42	6.1*	24*	Poor
216.7A	16.0	21	291.3	86.5	43	6.8*	24*	Fair- Poor
213.0A	15.0	19	189.4	36.3	58*	7.4*	27*	Fair
213.0D	16.0	16	154.5	6.2	58*	6.6*	32*	Fair
211.5A	19.0	22	819.0	204.0	54*	7.0*	27*	Fair
211.5D	18.0	18	698.5	54.3	54*	8.1ns	34*	M. Good- Fair
210.1A	18.5	25	367.0	90.5	56*	6.7*	27*	Fair
210.1D	25.0	25	751.5	72.2	56*	7.3*	38	Fair- M. Good
207.2A	19.5	25	555.0	31.9	66*	8.1ns	29*	M. Good- Fair
207.2D	22.0	22	378.0	31.2	66*	7.1*	34*	Fair
201.2A	21.0	23	423.0	55.8	53	8.5	36*	Good- Fair
201.2D	29.0	29	1351.9	40.0	53	9.1	38ns	V.Good- M.Good
145.5A	20.0	20	220.0	55.0	--	8.6	38ns	Good- M.Good
Scioto River 1981								
145.5	10.7	19	173.4	27.9	--	7.6*	34*	Fair
140.0	6.7	10	116.0	10.5	56	5.4*	25*	Poor
Scioto River 1980								
145.5	11.7	15	223.3	43.1	--	6.9*	38ns	Fair- M. Good
142.8	10.0	15	120.7	18.3	51	6.5*	26*	Fair
140.0	9.0	14	260.7	25.3	56	5.8*	29*	Poor- Fair
Scioto River 1979								
170.8	15.0	15	580.5	116.7	--	8.3ns	32*	M. Good- Fair
165.1	11.0	11	400.0	72.2	--	8.5	34*	Good- Fair
160.3	19.0	19	406.5	36.0	--	8.8	36*	Good- Fair
155.2	13.7	16	399.3	62.5	--	8.1ns	36*	M. Good- Fair

Table 16. Continued.

River Mile	Mean Number Species	Cumulative Species	Mean Rel. No (No./0.3 km)	Mean Rel. Wt. (kg/0.3 km)	QHEI	Mean Miwb[a]	Mean IBI	Narrative Evaluation
Scioto River (1979)								
150.0	12.7	22	366.6	38.3	50	7.6*	30*	Fair
145.5	15.7	24	198.0	55.7	--	7.6*	38ns	Fair- M. Good
142.8	13.3	21	350.0	34.2	51	8.2ns	34*	M. Good- Fair
140.0	10.3	16	428.0	41.1	56	7.2*	33*	Fair
Cottonwood Ditch	***1995 Eastern Cornbelt Plains MWH (Existing)***							
2.4	16.0	21	589.3	NA	25.5	NA	31*	Fair
0.8	20.0	26	775.2	NA	30.0	NA	31*	Fair
Cottonwood Ditch 1994								
4.1	12.5	15	740.0	NA	--	NA	32*	Fair
Cottonwood Ditch 1987								
5.3	1.0	1	813.8	NA	36	NA	16*	Poor
4.1	14.0	14	2457.0	NA	36	NA	24*	Poor
2.9	11.0	11	1344.0	NA	31	NA	24*	Poor
Cottonwood Ditch 1984								
2.5	13.7	18	1166.7	NA	20	NA	23*	Poor
0.7	6.7	9	234.7	NA	26	NA	24*	Poor
Silver Creek 1995	***Eastern Cornbelt Plains WWH (Existing)***							
2.4	23.0	29	1457.0	7.2	64.5	NA	40	Good
Silver Creek 1984								
2.4	21.0	25	827.3	3.1	68	NA	40	Good
Taylor Creek 1995								
4.5	20.0	21	2997.8	18.3	77.5	NA	42	Good
2.1	16.0	17	2727.0	22.3	61.5	NA	44	Good
2.0	18.5	22	923.3	10.8	56.0	NA	39	M. Good
0.8	23.5	27	1043.3	21.0	46.5	NA	42	Good
Taylor Creek 1994								
5.3	15.5	17	1598.1	NA	--	NA	43	Good
Taylor Creek 1984								
4.4	21.3	25	2502.7	56.9	77	NA	39ns	M. Good
1.4	18.3	23	3118.2	62.3	53*	NA	35ns	M. Good
0.8	18.0	25	655.0	17.5	64*	NA	28*	Fair

Table 16. Continued.

River Mile	Mean Number Species	Cumulative Species	Mean Rel. No No./0.3 km	Mean Rel. Wt. kg/0.3 km	QHEI	Mean Miwb[a]	Mean IBI	Narrative Evaluation
Panther Creek 1995								
9.0	13.5	15	1746.0	NA	66.5	NA	37[ns]	M. Good
5.7	11.5	14	413.0	5.1	73.5	NA	28[*]	Fair
1.9	21.0	24	489.8	7.4	81.0	7.4[*]	42	Fair- Good
Wildcat Creek 1995								
6.8	19.0	22	1160.0	NA	28.0	NA	37[ns]	M. Good
0.6	22.5	25	689.3	8.2	50.0	7.8[ns]	38[ns]	M. Good

Ecoregion Biocriteria: Eastern Cornbelt Plain

Site Type	IBI WWH	IBI EWH	IBI MWH[c]	MIwb WWH	MIwb EWH	MIwb MWH[b]
Headwaters	40	50	24			
Wading	40	50	24	8.3	9.4	5.6
Boat	42	48	24	8.5	9.6	5.7

a - MIwb is not applicable to headwater streams with drainage areas $\leq$ 20 mi^2.
b - Modified Warmwater habitat criteria for channel modified streams.
ns - Nonsignificant departure from biocriteria ($\leq$4 IBI units or $\leq$0.5 MIwb units).
* - Indicates significant departure from applicable biocriteria (>4 IBI units or >0.5 MIwb units). Underlined scores are in the Poor or Very Poor range.

Cottonwood Ditch

Twenty eight fish species (1774 individuals) were collected in Cottonwood Ditch. Sampling occurred twice at two sites bracketing the McGuffey WWTP. The headwater narrative rating of fair at both locations (IBI=31) was a significant departure from ecoregional expectations for the WWH aquatic life use designation. Green sunfish (32% in number, 9% in biomass), white sucker (18% in number, 36% in biomass), bluntnose minnow (15% in number) and carp (35% in biomass) comprised most of the fish community. Potential impacts to the fish community by the McGuffey WWTP were overshadowed by the expansive instream habitat impairments ($\bar{x}$ QHEI=27.8); however, both fish and macroinvertebrate indices in the Scioto River mainstem declined slightly downstream from Cottonwood Ditch, relative to adjacent upstream and downstream sites.

Silver Creek

Twenty nine fish species (1697 individuals) were collected in two samples in Silver Creek upstream from SR 67 (RM 2.4) where a headwater rating of marginally good (IBI=39) was recorded. The fairly rich community was comprised of nine minnow species, eight darter species,

and five sensitive species. The percentage of pioneering fish ($\bar{x}$=54%) and the presence of only one headwater species were suggestive of some intermittent tendencies although flow was maintained during the sampling period. Generally, the fish community appeared intact and representative of ambient conditions.

Taylor Creek
Thirty fish species (7528 individuals) were collected during two sampling passes at three sites and a mixing zone in Taylor Creek. Good headwater IBI scores at RM 4.5 (IBI=42) and RM 0.8 (IBI=41) and a marginally good rating at RM 2.0 (IBI=39) were consistent with ecoregional expectations. No toxicity was evident in the Occidental mixing zone (RM 2.1, IBI=44). Similar to Silver Creek, Taylor Creek had good species richness including representation by minnows, darters, and sensitive species. An increase in stream flow between RM 2.0 and RM 0.8 was evident. At sites upstream from RM 0.8 a high percentage of pioneering fish ($\bar{x}$=57.8%) were collected whereas downstream only 18.5% of the fish community were pioneers. The increased flow was attributed to the Rockwell discharge (RM 1.2) which did not appear to otherwise influence the fish community.

Panther Creek
Twenty five fish species (2939 individuals) were collected at three sites in two sampling passes in Panther Creek. Despite good physical habitat conditions extant in Panther Creek ($\bar{x}$ QHEI=73.7), general fish community performance was only marginally good ($\bar{x}$ IBI=35.7) due to nutrient enrichment from unsewered discharges. In particular, the community at RM 5.7 (IBI=28) failed to meet WWH ecoregional expectations due to the unsewered Village of Ridgeway. This departure was driven by high percentages of pioneering ($\bar{x}$=74.5%) and tolerant fishes ($\bar{x}$=65.5%), and low relative numbers of non-tolerant fishes.

Wildcat Creek
Thirty three fish species (1827 individuals) were collected in Wildcat Creek. Two samples were collected from each of two sites located downstream from the unsewered village of Mt. Victory. The marginally good performance by the fish community ($\bar{x}$ IBI=37.5) was more a reflection of the limitations of poor physical habitat ($\bar{x}$ QHEI=39), and less indicative of impairment attributable to the Mt. Victory. The extraordinary species richness resulted in favorable IBI metric scores for number of minnow, sucker, and darter species, and for number of simple lithophils. Otherwise, the fish community was dominated by tolerant omnivores.

Trend Assessment

Chemical Water Quality Changes: 1984-1995.

The following is an evaluation of changes in water quality which have occurred in the Scioto River, Cottonwood Ditch, and Taylor Creek between 1984 and 1995. Historical data used in this

evaluation was contained in the Biological and Water Quality Study of the Scioto River including Cottonwood Ditch, Taylor Creek, and Silver Creek (Ohio EPA, 1985). Mean concentrations of D.O. (dissolved oxygen), BOD_5 (5-day biochemical oxygen demand), NH_3-N (ammonia-nitrogen), NO_x-N (nitrate+nitrite-nitrogen), total phosphorus (P), and total nonfilterable residue (total suspended solids, TSS) were determined and plotted in a longitudinal fashion to display trends in these physical and chemical properties.

Scioto River

Water quality parameters measured at similar locations upstream from the Kenton WWTP generally showed no appreciable change in concentrations between 1984 and 1995 (Figure 18). An exception was decreases in mean phosphorus and ammonium concentrations at RM ≈220 downstream from Cottonwood Ditch, owing to decreased loadings from the McGuffey WWTP. A noticeable decrease in ammonium concentration was also noted at the two stations between the confluence of Taylor Creek and the Kenton WWTP (RMs ≈ 213 and 211.4), likely due to decreases in loadings from Occidental Chemical Corp. and the tie-in of Rockwell International to the Kenton WWTP.

Decreased loading of ammonium by the Kenton WWTP resulted in appreciable differences in the in-stream concentrations downstream from the plant (Figure 18). Also, phosphorus and BOD_5 concentrations decreased in 1995 relative to 1984 downstream from the plant. Although nutrient levels downstream from the Kenton WWTP have decreased since 1984, enriched conditions persist.

Cottonwood Ditch

Mean NH_3-N concentration increased downstream from the Village of Alger WWTP in 1995 compared to 1984, reflecting increased loadings. Otherwise, measured water quality parameters remained constant between surveys.

Decreased loadings of ammonium and phosphorus by the new Village of McGuffey WWTP resulted in an order of magnitude decrease in the in-stream concentrations in 1995 relative to 1984. Mean BOD_5 and TSS concentrations also decreased from 18.0 mg/l to 7.6 mg/l, and 110 mg/l to 26 mg/l, respectively (Figure 19). However, the mean NOx-N concentration increased from 0.09 mg/l to 0.53 mg/l, corresponding to the decrease in NH_3-N. Despite measurable improvements, conditions continue to be degraded as the facility has had operational problems due to excessive infiltration and inflow into the collection system, and sludge not returning to the oxidation ditch.

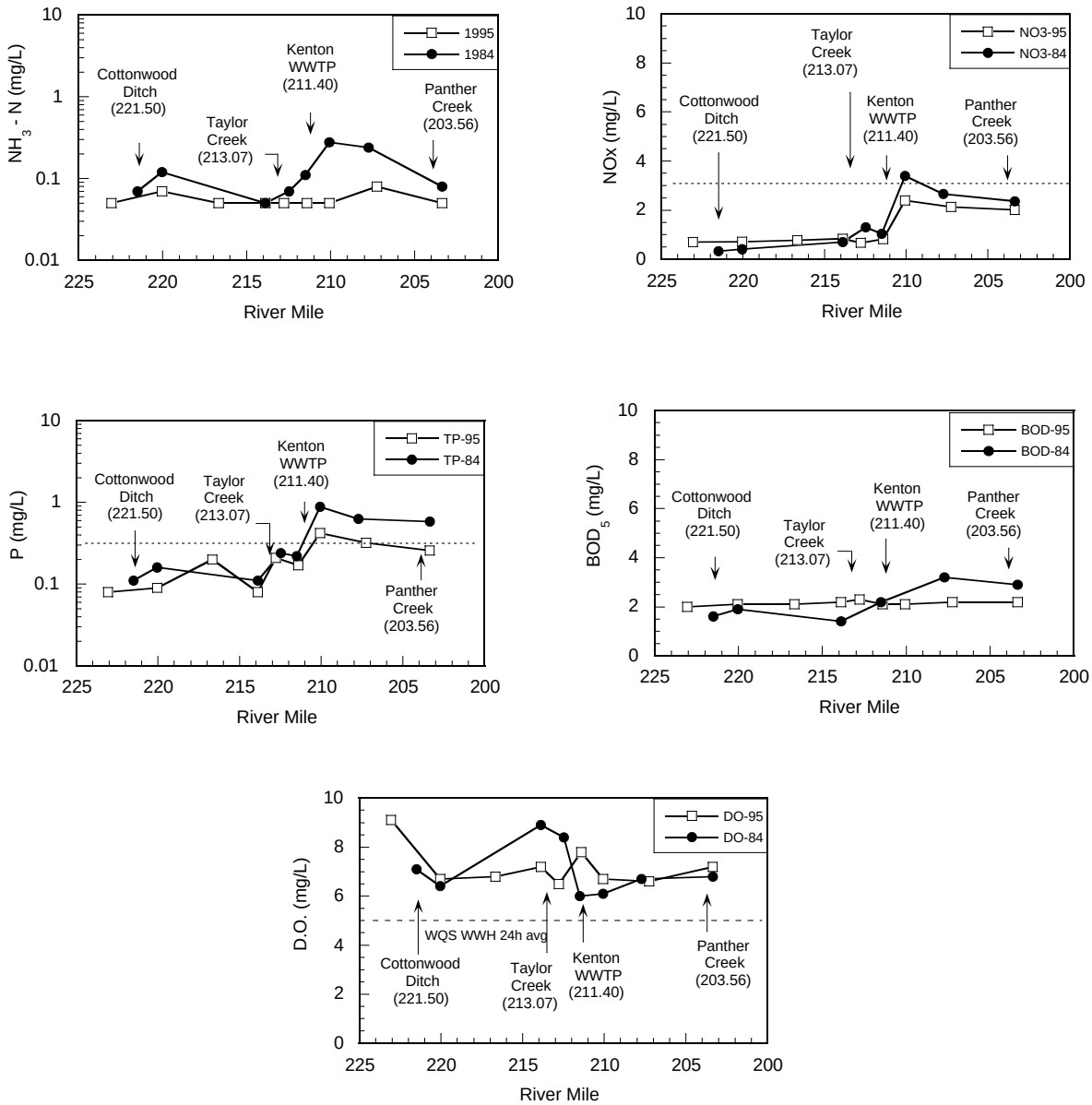


Figure 18. Mean concentrations of select water quality parameters collected at similar locations from the Scioto River, 1984 and 1995, in relation to major tributaries and the Kenton WWTP. Left to right from top left, ammonium, nitrate-nitrite, phosphorus, 5-day biochemical oxygen demand, and dissolved oxygen. The dashed horizontal line in the plots of nitrite-nitrate and phosphorus reprsent the 75th percentile for the Eastern Corn Belt Plains ecoregion.

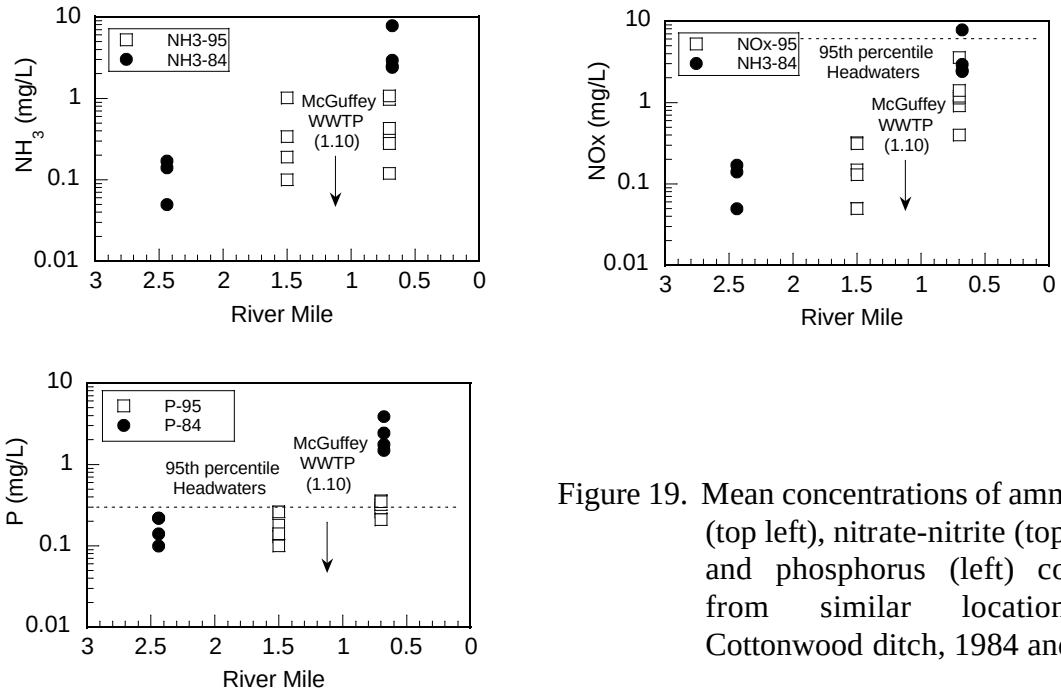


Figure 19. Mean concentrations of ammonium (top left), nitrate-nitrite (top right), and phosphorus (left) collected from similar locations in Cottonwood ditch, 1984 and 1995.

Taylor Creek

No substantial change occurred between 1984 and 1995 in water quality parameters measured at the ambient sampling station located on Taylor Creek at Buck T.R. 180 (RM 4.43). Downstream from Occidental Chemical Corp., significant decreases in mean total inorganic nitrogen concentrations were documented (Figure 20), resulting from the addition of an adsorption filter and activated carbon treatment system and diversion of storm water to an interruption pond for subsequent treatment at Occidental Chemical in 1991. Mean P concentrations continued to be extremely elevated, and increased from 1.24 mg/l to 1.93 mg/l. Rockwell International connected their process and sanitary wastewater to the City of Kenton sanitary sewer on August 30, 1995. Any changes associated with the tie-in were not detectable due to the influence of Occidental Chemical Corp.

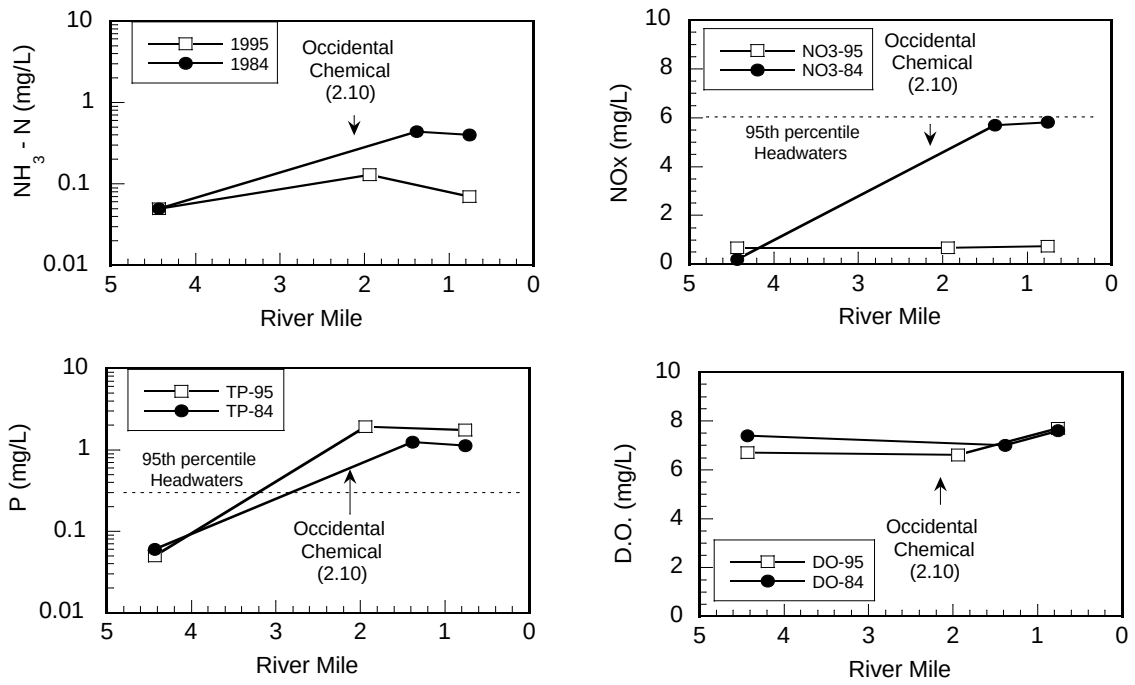


Figure 20. Mean concentrations of ammonium (top left), nitrate-nitrite (top right), phospho rus (lower left) and dissolved oxygen in water quality grab samples collected fro m Taylor Creek, 1995 and 1984, in relation to the Occidental Chemical Corp.

Changes in Macroinvertebrate Communities: 1984 - 1995

Scioto River

Macroinvertebrate community performance in the Scioto River within Hardin County ha s improved substantially compared to the 1984 study (Ohio EPA 1985). The 1995 ICI score s increased 12 to 38 points compared to the 1984 data (Figure 21). The 1 984 study concluded that the slow current speed and siltation ass ociated with channelization was the primary cause of the macroinvertebrate community not achieving biocriterion expectations. Macroinvertebrat e communities sampled in 1984 at stations with riffle development performed in the marginall y good to good range, whereas in 1995, they were in the very good to exceptional range. The reason for the improved community performance in 1995 is not known but indicates an overal l improvement in the upper Scioto River.

Macroinvertebrate community response downstream from the confluence of Cottonwood Ditch in 1984 indicated a mild organic enrichment effect exempli fied by increased density (133 to 395 orgs./sq. ft.) and increased numbers of oligochaetes and midges. However, due to increases in other community components, the ICI increased slightly to 20 (fair) compared to 18 upstrea m

from Cottonwood Ditch. Community performance in 1995 did not indicate any organic enrichment downstream from Cottonwood Ditch due to decreased nutrient loadings by the Village of McGuffey WWTP.

Macroinvertebrate community performance in the fair range (ICI=18 at RM 212.5) downstream from Taylor Creek in 1984 was attributed to adverse effects associated with channelized habitat conditions without any discernible impact from Taylor Creek.

Macroinvertebrate community performance in 1984 downstream from Kenton CSOs and upstream from the Kenton WWTP increased slightly to an ICI value of 22 (fair) compared to 18 upstream from the CSOs. However, increased predominance of tolerant taxa (26.6% compared to 3.7 % upstream), composed primarily of oligochaets, indicated a slight impact from organic loadings from the CSOs. Community response in 1995 did not detect a similar impact from the CSOs.

Macroinvertebrate community performance downstream from the Kenton WWTP in 1984 was not indicative of any significant impact. The ICI at RM 210.1 increased to 32 (marginally good) due primarily to improved current speed and habitat. The abundance of tolerant taxa remained relatively high at 12.8% which indicated continued or additional impact. The abundance of tolerant taxa remained relatively high at RM 207.7 (16.5%) and then dropped to 3.8% at RM 203.3. This trend may have indicated an enrichment impact from Kenton CSOs and the WWTP in 1984. A similar impact was documented in the 1995 study.

Macroinvertebrate community performance in the vicinity of the Little Scioto River confluence in 1987 demonstrated similar results to the 1995 study (Figure 21). The community declined from exceptional (ICI=48 at RM 179.6) upstream from Green Camp to fair (ICI=26 at RM 176.8) downstream from the Little Scioto River, the unsewered community of Green Camp, and was within an area impounded by a low-head dam near the village of Prospect. The reduced habitat conditions associated with the impoundment was undoubtedly a significant factor in the reduced community performance downstream from the confluence of the Little Scioto River during both years, although heavy metal and PAH contamination historically documented (Ohio EPA 1988, 1994) in the Little Scioto River and Scioto River contributed to the observed impairment.

Cottonwood Ditch

Macroinvertebrate community performance in Cottonwood Ditch in 1984 indicated a severe impact from the McGuffey WWTP. The community upstream from McGuffey at RM 2.4 was limited by channelized stream habitat and supported five EPT taxa with midges, elmid beetles, and hydropsychid caddisflies predominant. Downstream from the McGuffey WWTP at RM 0.7 a poor community was present with no EPT taxa collected and the community dominated by the tolerant midge genus *Chironomus*. The community performance downstream from the McGuffey WWTP in 1995 improved to fair (ICI=28). This improvement indicates improved WWTP performance, but illustrates a continued impact given the improved habitat present at this station.

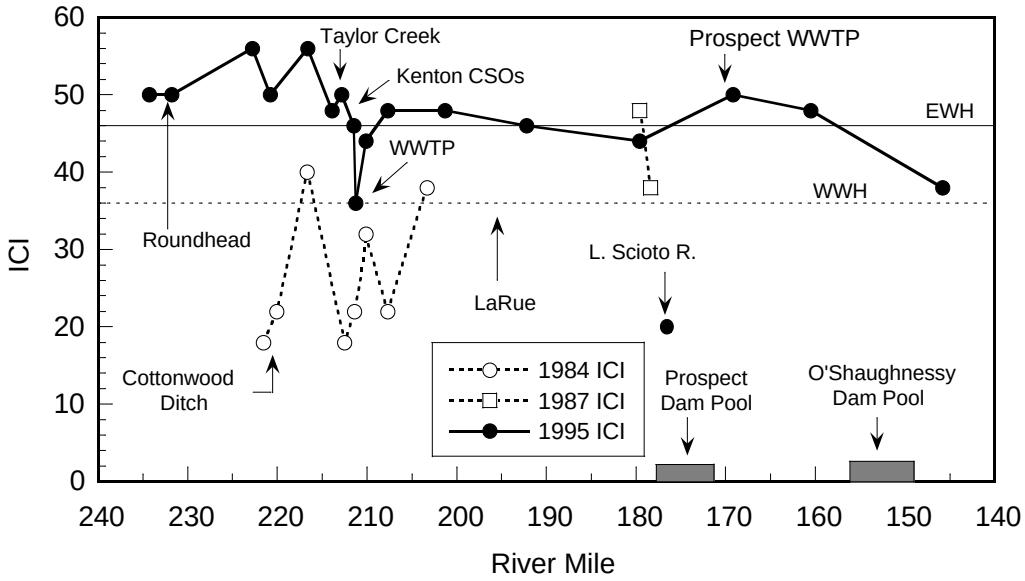


Figure 21. Comparisons of Invertebrate Community Index (ICI) scores from similar sampling locations in the Scioto River, 1984, 1987 and 1995, in relation to select tributaries and evaluated point sources.

Taylor Creek

Macroinvertebrate community performance in Taylor Creek in 1984 indicated a general decline from a good community (EPT=9 at RM 4.4) upstream from Occidental Chemical Corp. to marginally good (EPT=6 at RM 1.4) downstream from Occidental Chemical Co. to marginally fair (EPT=4 at RM 0.8) downstream from Rockwell International. Water chemistry parameters indicated that the documented impacts downstream from these dischargers were caused primarily by poorly treated organic wastes. A similar decline was documented in 1995 except to a lesser degree. Community performance declined from exceptional (ICI=56) at RM 4.5 to marginally good (ICI=34) at RM 0.7. Improvement in community performance downstream from the industrial dischargers indicates improved wastewater treatment, but demonstrates a continued impairment, especially at the downstream station.

Silver Creek

The macroinvertebrate community showed slight improvement between 1984 and 1995. Thirteen EPT taxa were collected in 1995 compared to three in 1984.

Changes in Fish Communities: 1984-1995

Scioto River

Fish community sampling in the upper Scioto River was previously conducted over a similar reach in 1984, and sporadically at a limited number of locations since 1979 (Table 16). Because sampling in 1984 provided the most comparable data with the 1995 effort, the discussion is limited to it. In 1984 two sampling passes were conducted with boat methodology which is most suitable for drainage areas greater than 200mi^2 while only one pass utilized wading methods. Since most of the 1984 sampling encompassed a drainage area less than 200mi^2, the pass completed using wading methodology was most similar to the 1995 work. In general, the 1984 wading pass resulted in a fair assessment (IBI=35, MIwb=7.3, n=4) whereas in 1995 a good - marginally good assessment (IBI=41, MIwb=8.2, n=10) was determined for the reach through Kenton (RM 213 to RM 207; Figure 22).

Analysis of individual metric scores did not indicate any particular single factor was responsible for the improved fish community performance through this reach. Rather, it appeared an overall marginal improvement since 1984 in water quality, physical habitat and ambient environmental conditions was likely reflected in the 1995 data.

In 1984 Taylor Creek, which enters this reach at RM 213.1, was negatively influenced by discharges from Occidental Chemical and Rockwell International. The subsequent impact to the Scioto River was less pronounced but the assimilative capacity of the stream was certainly reduced by this loading. The Kenton WWTP and the CSOs were also considered sources of nutrient enrichment at that time (Ohio EPA 1985). Beyond these pollutant sources, the Scioto River in 1984 was impaired by channel modifications and poor agricultural land use practices.

In 1995 neither Occidental Chemical nor Rockwell International were considered negative influences on the fish communities in Taylor Creek or to the Scioto River, but a slight impact from the Kenton WWTP was evident. The CSO's were a possible enrichment source although no localized biological community impairment was noted in 1995. The largest factor accounting for the modest improvement in the biological indices documented in 1995 is likely that the process of natural restoration from historical channel modifications had an additional 11 years to recover between 1984 and 1995.

The ADV/mile for IBI and MIwb scores between RM 213.0 to RM 207.2 reflect the improvement between 1984 and 1995. In 1984 the ADV/mile was 11.5 for the IBI and 19.0 for the MIwb. In 1995 the departure from criteria decreased to an ADV/mile of 2.1 for the MIwb and no departure as measured by the IBI (Table 17). In 1995, 76% of the reach fully attained and 24% partially attained the ecoregional standards. In contrast in 1986, none of the reach fully attained while 72% partially attained and 28% did not meet minimum standards.

Cottonwood Ditch

In 1984 poor IBI scores of 23 and 24 were recorded at RM 2.5 and RM 0.7, respectively. At the same sites in 1995 (RM's 2.4 and 0.8) fair scores of 33 were determined. These sites were intended to assess the potential influence of the McGuffey WWTP. Some evidence of impact from the plant was evident in 1984. The number of species, relative number and biomass all declined downstream. However, the larger effects of gross habitat destruction prevailed in 1984 and also in 1995. An impact from the McGuffey WWTP was not evident in 1995. This was attributed to the plant upgrades which were completed in 1992.

Silver Creek

Only slight differences existed between fish communities sampled in 1984 and 1995 at RM 2.4. In both years mean IBI values were 40. Two sucker species (predominated by juveniles) collected in 1984 but not in 1995, elevated the sensitive species metric in the 1984 results. In 1995 two minnow species (comprised by one and seven individuals) not present in 1984, were collected which elevated that metric in the later data set.

Taylor Creek

A significant difference between 1984 and 1995 IBI scores from Taylor Creek occurred downstream of the Occidental Chemical and Rockwell International discharges. In 1984 the poor fish community at RM 0.8 (IBI=28) was predominated by tolerant omnivore and generalist feeding species. Metric scores for sensitive species, darters, lithophils and relative numbers less tolerants were reduced in 1984 compared to 1995. The improvement of fish community demonstrated by these metrics in 1995 was attributed to upgraded effluent treatment at Occidental Chemical and Rockwell International.

Table 17. Area of Degradation (ADV) statistics for similar segments of the upper Scioto River sampled in 1995 and 1984.

	Biological Index Scores				Area of Degradation Values			Attainment Status (Miles)			
Year Index	Upper RM	Lower RM	Mini-mum	Maxi-mum	ADV	ADV/ Mile	Poor/ Very Poor	Full	Partial	NON	Poor/ Very Poor
Upper Scioto River (1995)											
IBI			37	43	0	**0.0**	0				
MIwb	213.0	207.2	7.0	9.1	12	**2.1**	0	4.4	1.4	**0.0**	0.0
ICI			36	50	0	**0.0**	0				
(1984)											
IBI			32	38	67	**11.5**	0	0.0	4.2	**1.6**	0.0
MIwb	213.0	207.2	6.6	8.1	110	**19.0**	0				
ICI			18	32	425	**73.3**	0				

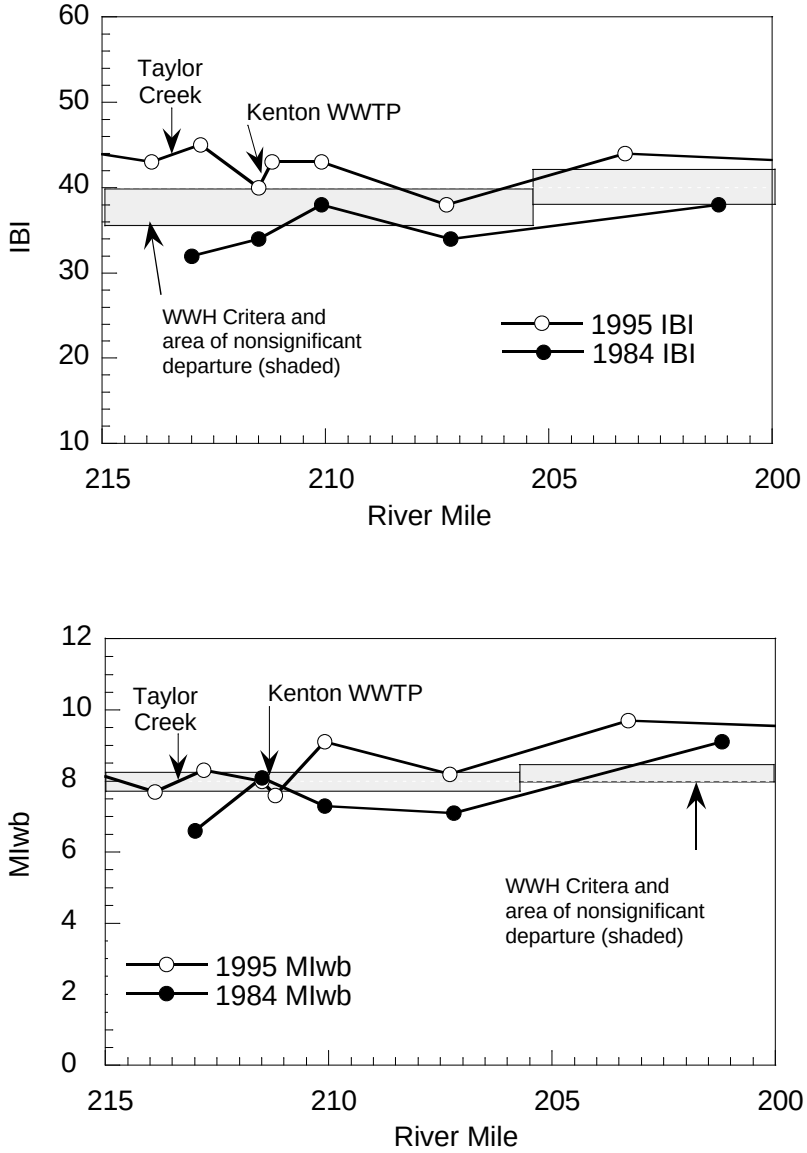


Figure 22. Longitudinal comparison of Index of Biotic Integrity (IBI) and Modified Index of Well-being (MIwb) scores obtained from a similar reach of the upper Scioto River, 1995 and 1984. The location of the Kenton WWTP is shown for reference.

Addendum

Status of streams in the vicinity of AgriGeneral's LaRue Farms prior to land-application of poultry wastes

INTRODUCTION

Disposal of manure and compost generated by two large chicken production facilities, an egg farm and a pullet farm owned and operated by AgriGeneral, is slated to be land applied on fields within a 50 mile radius of the two plants. Baseline monitoring of streams potentially affected by the land application of manure was conducted in 1995 to assess pre-application conditions.

SUMMARY

Responses by the macroinvertebrate and fish communities demonstrated these streams were impacted by channel modifications and the existing poor land use practices (Figure 1). All of the streams sampled (excluding Panther Creek and Wildcat Creek, see *Upper Scioto River Basin*) were not attaining designated use criteria (Table 1). Channelization or dredging, and runoff from poor land use practices resulted in habitat degradation and nutrient enrichment. The few mayfly and caddisfly taxa found in macroinvertebrate samples were ones that are most tolerant to perturbations caused by channel modification and agricultural runoff. Fish communities also reflected these conditions. Headwater species were supplanted by pioneering fishes and species requiring clean gravel substrates to spawn were poorly represented owing to habitat degradation and siltation. Nutrient enrichment, combined with poor habitat, was evident in the high percentages of fishes considered tolerant ($\bar{x}$ 78.4%± 14.1 SD) and omnivorous ($\bar{x}$ 41.3 ± 25.3 SD).

Although none of the fish communities met WWH standards and habitats were commonly degraded, components of typical WWH fish assemblages were found in several streams, especially in the unchannelized lower reaches of the larger creeks. For example, four species of darter, smallmouth bass, brindled madtom, and rosefin shiner were present at RM 2.7 in McDonald Creek. Similarly, Tymochtee Creek at RM 38.9 supported six species of darters, stonecat madtom, rock bass and hogsucker. Pawpaw Run harbored twenty-two species of fish, including three species of darters and hogsucker. The presence of these remnant WWH faunas suggests that recovery is possible if the present practice of periodic channel maintenance and riparian removal in the upper headwaters is curtailed. Only Thopson Ditch and Carrol Ditch are petitioned ditches.

RECOMMENDATIONS

Although none of the communities sampled met applicable biological criteria, and most habitats were degraded, components of typical WWH fish assemblages were found in several streams, especially in the unchannelized lower reaches of the larger creeks. The presence of these remnant WWH faunas suggests that recovery is possible if the present practice of periodic channel maintenance and riparian removal in the upper headwaters is curtailed. Furthermore, the application of manure is likely to exacerbate nutrient enrichment, especially given the limited riparian buffers. Therefore, reestablishment of riparian habitat is essential to minimize potential impacts.

Table 1. Pre-land application aquatic life use attainment status for streams sampled near the AgriGeneral - LaRue Farms, June-September, 1995. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores based on the performance of the biotic community. The Qualitative Habitat Evaluation Index (QHEI) measures the ability of the physical habitat to support aquatic life.

River Mile Fish/Invertebrate	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Comment
McDonald Creek			*WWH existing*			
9.1	22*	NA	Fair*	22	**NON**	Recently channelized
6.8	23*	NA	Fair*	60	**NON**	
2.7	25*	NA	Fair*	65	**NON**	
Little Sandusky River			*WWH existing*			
10.4/--	--	--	--	24		Unsampleable - silt
3.7	29*	5.9*	Poor*	61	**NON**	
U. T. to Little Sandusky River			*Undesignated*			
0.9	25*	NA	Poor*	18	**NON**	Recently channelized
Tymochtee Creek			*WWH existing*			
51.6	21*	NA	Poor*	49	**NON**	
47.3/47.2	30*	6.0*	Fair*	52	**NON**	
42.8	29*	6.8*	Fair*	72	**NON**	
38.9	32*	7.4*	Fair*	70	**NON**	
Blood Run			*WWH existing*			
1.4	19*	NA	Fair*	55	**NON**	
Prairie Run			*WWH existing*			
6.2	32*	NA	Poor*	19	**NON**	Recently channelized
1.1/--	23*	NA	Poor*	37	**NON**	
Enoch Creek			*WWH existing*			
1.4	31*	NA	Poor*	47	**NON**	
PawPaw Run			*WWH existing*			
4.0	22*	NA	Fair*	43	**NON**	Recently channelized
0.6	26*	NA	Poor*	69	**NON**	
Carrol Ditch			*WWH existing*			
1.0/--	18*	NA	--	26	(**NON**)	Recently channelized

Table 1. Continued.

River Mile Fish/Invertebrate	Attainment IBI	MIwb[a]	ICI[b]	QHEI	Status	Comment
Thompson Ditch		*WWH existing*				
1.7	22*	NA	--	27	(**NON**)	Recently channelized

Ecoregion Biocriteria: Eastern Cornbelt Plain

Site Type	IBI WWH	IBI EWH	IBI MWH[c]	MIwb WWH	MIwb EWH	MIwb MWH[c]
Headwaters	40	50	24			
Wading	40	50	24	8.3	9.4	5.8
Boat	42	48	24	8.5	9.6	6.2

a - MIwb is not applicable to headwater streams with drainage areas ≤ 20 mi^2.
b - Narrative evaluation based on the qualitative sample used in lieu of numeric score.
* - Indicates significant departure from applicable biocriteria (>4 IBI units or >0.5 Miwb uits). Underlined scores are in the Poor or Very Poor range.
c - Modified warmwater habitat criteria for channel modified habitats

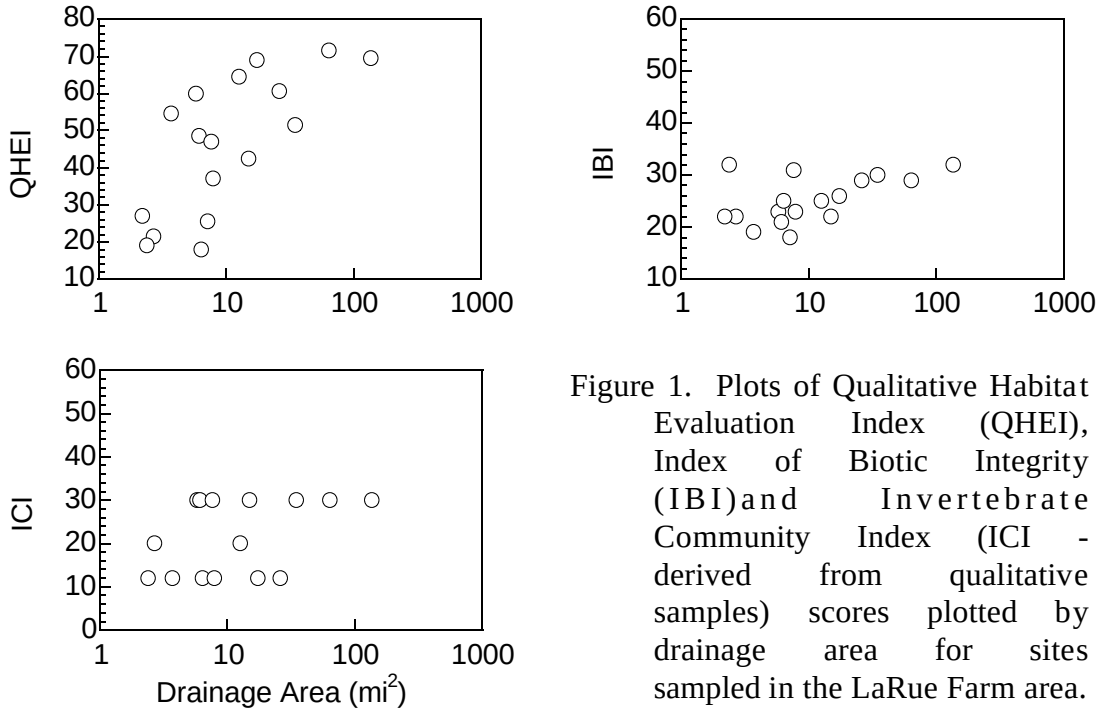


Figure 1. Plots of Qualitative Habitat Evaluation Index (QHEI), Index of Biotic Integrity (IBI) and Invertebrate Community Index (ICI - derived from qualitative samples) scores plotted by drainage area for sites sampled in the LaRue Farm area.

McDonald Creek*, *Little Sandusky River*, *Tymochtee Creek, Prairie Run*, *Enoch Creek*, *and PawPaw Run

Status of Aquatic Life Uses

All of the above waters are designated Warmwater Habitat. Neither the macroinvertebrate nor fish communities were meeting their respective WWH criterion at any of the locations sampled.

Status of non-aquatic Life Uses

All of the above listed streams are designated Agricultural Water Supply, Industrial Water Supply and Primary Contact Recreation. Those designations are appropriate.

Other Recommendations

Because aquatic communities and water quality is already compromised by poor land-use practices, lack of riparian buffers and channel maintenance activities, it is imperative that riparian buffers be expanded or reestablished adjacent to fields receiving poultry wastes to minimize further impacts.

Future Monitoring Concerns

A record detailing dates, frequency, amounts, and which fields received poultry wastes needs to be maintained. Nutrient, fecal coliform and fecal streptococcus levels need to be periodically monitored in streams adjacent to and downstream from fields receiving poultry wastes.

Unnamed tributary to Little Sandusky River*, *and Blood Run

Status of Aquatic Life Uses

Aquatic communities were not meeting WWH biological criteria.

Status of non-aquatic Life Uses

Agricultural Water Supply, Industrial Water Supply and Primary Contact Recreation appear to be appropriate non-aquatic designations for Blood Run. Secondary Contact Recreation should apply to the Unnamed tributary to Little Sandusky River.

Other Recommendations

Riparian buffers need to be established, especially adjacent to fields receiving poultry wastes.

Future Monitoring Concerns

Periodic monitoring of nutrient, fecal coliform and fecal streptococcus levels subsequent to land applications is recommended.

Carrol Ditch and Thompson Ditch

Status of Aquatic Life Uses

Thompson Ditch and Carrol Ditch are currently undesignated in the WQS. Because both are petitioned ditches, a Modified Warmwater Habitat use designation is recommended.

Status of non-aquatic Life Uses
Agricultural Water Supply, Industrial Water Supply and Secondary Contact Recreation appear to be appropriate non-aquatic designations.

Future Monitoring Concerns
Periodic monitoring of nutrient, fecal coliform and fecal streptococcus levels subsequent to land applications is recommended.

Table 2. Existing and recommended waterbody use designations for stream segments sampled in the 1995 Upper Scioto River Basin survey, including streams in the vicinity of the AgriGeneral egg farms. Changes to existing use designations appear in ***bold italics*** and with a triangle in new recommended designation. Designations based on the 1978 water quality standards for which results of biological field assessments are now available appear as plus signs to the right of existing markers.

Stream Segment	**Use Designations**												
		Aquatic Life Habitat						**Water Supply**			**Recreation**		
	SRW	**WWH**	**EWH**	**MWW**	**SSH**	**CWH**	**LRW**	**PWS**	**AWS**	**IWS**	**BW**	**PCR**	**SCR**
McDonald Creek (Scioto River Basin)		*/+							*	*		*	
Tymochtee Creek		*/+							*	*		*	
Blood Run		+							*	*		*	
PawPaw Run		*/+							*	*		*	
Enoch Creek		*/+							*	*		*	
Prairie Run		*/+							*	*		*	
Little Sandusky River		*/+							*	*		*	
Unnamed Tributary to Little Sandusky River (05-070)				+					*	*		*	
Carrol Ditch		*		▲					*	*		*	
Thompson Ditch		*		▲					*	*		*	

Table 3. Locations sampled in the area of proposed manure land-application from AgriGeneral 's LaRue Farms, 1995 (B-benthic macroinvertebrates; C-conventional water chemistry; F - fish).

Stream/ River Mile	Type of Sampling	Latitude/Longitude	Landmark	USGS 7.5 Minute Quadrangle Map
McDonald Creek				
9.1	B,C,F	403108/832610	CR 240	LaRue
6.8	B,C,F	403244/832620	CR 245	LaRue
2.7	B,C,F	403329/832251	SR 37	LaRue
Little Sandusky River				
3.7	B,C,F	404325/831337	Stauffer Rd.	Morral
U.T. to Little Sandusky River				
0.9	B,C,F	404038/831358	Upper Sandusky-Prospect Rd.	Morral
Tymochtee Creek				
51.6	B,C,F	403800/831358	Cramer Rd.	Meeker
47.3	F	404000/831925	Ust Osburn Rd.	Meeker
47.2	B,C	404002/831926	Osburn Rd.	Meeker
42.8	B,C,F	404042/832324	Fail Rd.	Marseilles
38.9	B,C,F	404257/832335	CR 71	Marseilles
Blood Run				
1.4	B,C,F	403719/831419	Wildcat Pike	New Bloomington
Prairie Run				
6.2	B,C,F	403842/831433	Kenton-Gallion Rd.	Morral
1.1	B,C,F	403902/831818	Agosta-Meeker Rd.	Meeker
Thompson Ditch				
1.7	F	404019/831744	Meeker-Upper Sandusky Rd.	Meeker
Enoch Creek				
1.4	B,C,F	403906/832035	DeCliff Rd.	Meeker
Carrol Ditch				
1.0	F	404030/831927	Osburn Rd.	Meeker
PawPaw Run				
4.0	B,C,F	403903/832309	adj. Miles Rd.	Marseilles
0.6	B,C,F	404029/832327	Fail Rd.	Marseilles

Study Area

Baseline monitoring of streams in a three county area potentially affected by land-application of manure generated by two large chicken production facilities, an egg farm and a pullet farm owned and operated by AgriGeneral, was conducted in 1995 to assess pre-application conditions (Table 3). Disposal of manure would be by spreading it on fields within a 50 mile radius of the two plants. Sampling sites were picked for streams potentially affected by manure runoff based on maps of fields where manure spreading was to take place. Several sites outside the area of proposed land application were chosen as controls. The streams sampled were all in agricultural areas and had influence from row crop agriculture. No point sources were located in the sampling area.

Surface Water Quality

Chemical water quality was sampled at 9 locations in streams potentially receiving land-application run-off of manure from AgriGeneral's LaRue Egg Farms to assess preapplication conditions. Because the streams sampled drained intensively farmed areas with extensive channel modifications to headwater streams, ambient nutrient levels were elevated (Figure 2).

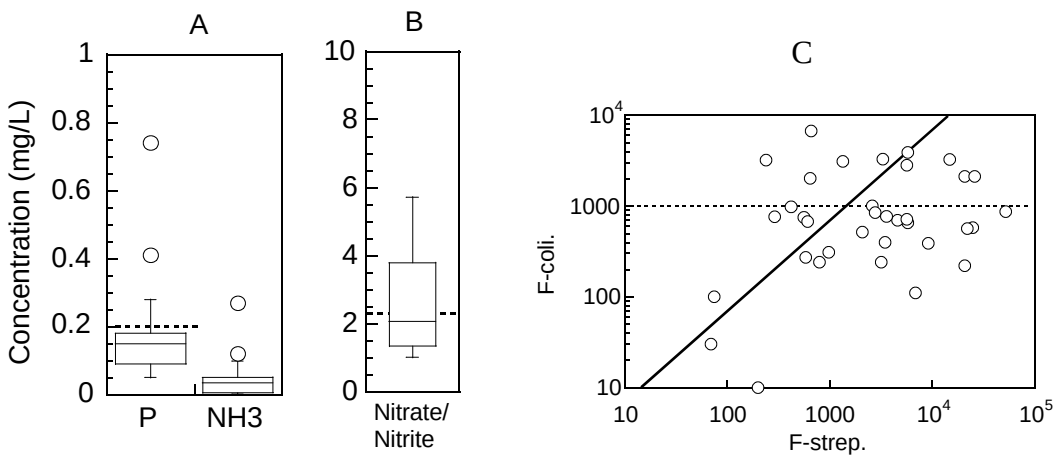


Figure 2. Distributions of total phosphorus and ammonium (A), nitrate-nitrite (B), and (C) a plot of fecal coliform on fecal streptococcus (colonies/100ml) in water quality grab samples collected from streams in the AgriGeneral, LaRue Farms study area, 1995, prior to land-application of manure. The solid diagnal line in (C) is the 7:10 ratio of coliform to streptococcus. Points falling at or below this line are strongly associated with livestock wastes. The dashed horizontal lines represent the 90th percentile value for total phosphorus for Eastern Corn Belt Plain headwaters, the 75th percentile for nitrite-nitrate, and primary contact WQS 30 day average for fecal coliform, respectively.

Approximately 75% of grab samples had total phosphorus concentrations exceeding 0.1mg/l, and nitrate-nitrite concencentrations in nearly 50% of the samples exceeded 2.0 mg/l, conditions favorable for high algal productivity. Additionally, high levels of fecal coliform and fecal streptococci in water quality grab samples, at ratios of coliform to streptococci less than or equal to 0.7 (Figure 2), suggests that livestock wastes may already have been contributing to the observed nutrient enrichment (Geldreich 1976).

Physical Habitat for Aquatic Life

The physical habitat for streams in the vicinity of the LaRue poultry farms was generally degraded by poor land-use practices associated with agriculture. Recent or historic channel modifications were evident at most headwater sites, riparian areas were narrow or nonexistent, and siltation was pervasive. Collectively, habitat attributes associated with channel modified streams were approximately 4.5 times (±4.02 SD) more numerous than habitat attributes defining functional unmodified streams. Although most headwater sites showed evidence of channel modifications, only Thompson Ditch and Carroll Ditch are petitioned ditches.

McDonald Creek

The physical habitat in McDonald Creek was evaluated at three sites (Table 4). The lower two sites were not channel modified and contained habitat of sufficient quality to support normal warm-water aquatic faunas as reflected by the low ratio of modified habitat attributes to warmwater habitat attributes. Substrates, though moderately silty, contained a variety of sizes. Channel development was good and woody debris added complexity. The most upstream site was channelized during the course of the summer, destroying any vestiges of warmwater habitat attributes observed at the begining of the summer.

Tymochtee Creek

Qualitative habitat evaluations at four sites on the Tymochtee Creek mainstem from RM 38.9 to 51.6 indicated that the physical habitat in the reach was generally capable of supporting warm-water faunas ($\bar{x}$ = 60.3 ± 11.9 sd; Table 4). Past channel modifications were evident at the two upstream sites in the relatively sparse cover, fair channel development, and a generally higher proportion of modified attributes than warmwater attributes. Recovery was evident, however, in low substrate embeddedness, and the presence of functional riffles. Black septic seepage originating from a nearby house was noted along the south bank at RM 51.6.

Blood Run

The habitat was relatively good for a small headwaters stream in this area. The site appeared to be non-channelized and had mature trees along both banks. Pools were well developed and had good cover consisting of rootwads and woody debris. Modified attributes were added, however, by adjacent agricultural land-use practices. The riffles were shallow and embedded, overall embedded was high, and silt cover was moderate to heavy.

Prairie Run
Habitat in Prairie Run was surveyed at two sites, RMs 6.2 and 1.1. The upstream site was a maintained ditch devoid of any warmwater habitat attributes. The downstream site had been previously channelized, and although mature trees lined both banks, little recovery was evident. Silt was very heavy, the substrates were extremely embedded, and channel development was poor.

Thompson Ditch
As the name implies, Thompson Ditch is a petitioned ditch subject to periodic channel maintenance activities. As such, it has uniform silty substrates of small particle size, grass and willow lined banks, little sinuosity, poor channel development, and little instream cover. The only warmwater habitat attribute noted was moderate amounts woody debris in the stream.

Carroll Ditch
Carroll ditch is a petitioned ditch, and like Thompson Ditch, it has uniform silty substrates of small particle size, grass and willow lined banks, little sinuosity, poor channel development, and little instream cover. Carroll Ditch differed from Thompson Ditch, however, in having absolutely no warmwater habitat attributes.

Enoch Creek
The site sampled had been channelized in the past and was in the process of recovering. Many mature trees were present along the banks, and a fair amount of woody debris was in the stream channel. The recovery had not reclaimed a significant number of warmwater habitat attributes as modified attributes still predominated. Channel development remained poor, sinuosity was low, riffles and channel substrates were embedded, and instream cover was sparse.

PawPaw Run
Habitat was evaluated at two sites in Paw Paw Run, RMs 4.0 and 0.6. The downstream site was in a natural state, with many mature trees along the banks supplying woody debris to the channel and rootwads for cover. The QHEI score of 69 reflected these positive warmwater habitat traits. Effects of channelization and poor land-use practices upstream, however, increased the ratio of modified habitat characteristics. The upstream site was heavily silted, lacked instream cover, and exhibited poor channel development and low sinuosity.

Little Sandusky River
Habitat at two sites in the Little Sandusky River, RMs 10.4 and 3.7, were evaluated. The upstream site was a channelized ditch with a substrate of knee-deep black muck that precluded fish sampling. The river at the downstream site flowed through a natural channel lined with mature trees. Woody debris formed much of the cover. The stream contained moderate to heavy amounts of silt, and appeared to be unstable due to the amount of sand in the pools and along the stream margins owing to poor land-use and channelization upstream.

Unnamed Tributary to the Little Sandusky River
This site was a channelized ditch entirely devoid of warmwater habitat attributes having grass banks, thigh-deep black muck substrates and no cover.

Table 4. QHEI matrix for sites sampled near AgriGenral - LaRue Farms, 1995.

Key QHEI Components

River Mile	QHEI	Gradient (ft/mile)	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 > 40cm	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.I. 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 Riffle	**Total M.I. MWH Attributes**	**MWH H.I./WWH Ratio**	**MWH M.I. WWH Ratio**
			WWH Attributes											MWH Attributes																				
														High Influence						*Moderate Influence*														
(02-166 McDonald Cree 166)																																		
9.1	21.5	5.32											0	●	●	●	●	●	5		▲			▲	▲	▲		▲	▲	▲	7	6.00	9.99
6.8	60.0	11.11	■	■			■	■		■	■	■	7						0		▲			▲				▲			3	0.13	0.50
2.7	64.5	5.32	■	■		■	■	■	■	■	■		9			●	●		2		▲			▲	▲						3	0.30	0.60
(05-033) Little Sandusky River																																		
10.4	23.5	3.08											0		●	●	●	●	4	▲	▲			▲	▲			▲	▲	▲	7	5.00	9.99
3.7	60.5	3.79	■	■		■	■	■	■		■	■	8		●				1		▲								▲		2	0.22	0.44
(05-070) Trib. to L. Sandusky R.																																		
0.9	18.0	2.75											0	●	●	●	●	●	5		▲			▲	▲	▲		▲	▲	▲	7	6.00	9.99
(05-300) Tymochtee Creek																																		
51.6	48.5	6.25				■	■			■		■	4				●	●	2	▲	▲			▲				▲			4	0.60	1.40
47.3	51.5	4.42						■		■	■	■	4		●		●		2	▲	▲			▲	▲			▲	▲		6	0.60	1.80
42.8	71.5	3.01	■	■		■		■			■	■	6						0		▲				▲			▲	▲		4	0.14	0.71
38.9	69.5	2.67	■	■			■	■		■	■	■	7				●		1		▲			▲	▲			▲	▲		5	0.25	0.88
(05-319) Paw Paw Run																																		
4.0	42.5	8.47									■	■	2	●	●	●	●		4	▲	▲			▲	▲			▲	▲		6	1.67	3.67
0.6	69.0	7.25	■	■			■	■		■	■	■	7						0		▲			▲				▲			3	0.13	0.50
(05-320) Carrol Ditch																																		
1.0	25.5	2.74											0	●	●	●	●	●	5		▲			▲	▲			▲	▲	▲	6	6.00	9.99
(05-321) Enoch Creek																																		
1.4	47.0	11.11	■										1			●	●	●	3	▲	▲			▲	▲			▲	▲	▲	▲	8	2.00	6.00
(05-322) Prairie Run																																		
6.2	19.0	2.65											0	●	●	●	●	●	5		▲			▲	▲	▲		▲	▲		▲	7	6.00	9.99
1.1	37.0	6.85									■		1		●	●	●		3	▲	▲			▲	▲			▲	▲	▲	▲	8	2.00	6.00
(05-323) Thompson Ditch																																		
1.7	27.0	4.06						■					1	●	●	●	●	●	5	▲	▲			▲	▲			▲	▲	▲	7	3.00	6.50
(05-324) Bood Run																																		
1.4	54.5		■			■	■	■					4			●	●	●	3		▲				▲			▲	▲	▲	5	0.80	1.80

Biological Assessment - Macroinvertebrate Communities

During the 1995 biological and water quality study of the upper Scioto River, the AgriGeneral Company was constructing a large egg farm in the headwaters of McDonald Creek, about 4.1 mi SW of the community of LaRue in Hardin County. Eight stations in three streams within the Scioto River drainage (including Panther Cr. and Wildcat Cr.) and 12 stations in seven streams within the Sandusky River drainage were sampled to evaluate the macroinvertebrate community health prior to the land application of chicken manure from the egg farm. The results from this sampling effort are summarized in Table 5.

Of the streams sampled (excluding Panther Cr. and Wildcat Cr.), none were achieving WWH expectations. Mayfly and caddisfly taxa richness (EPT) at all stations were below WWH expectations, ranging from zero in the unnamed tributary to Little Sandusky River (RM 0.9) to eight in Tymochtee Creek (RM 47.2). The few mayfly and caddisfly taxa found at these stations were ones that are the most tolerant to stream channel and agricultural runoff perturbations. Overall diversity was also relatively low, typically remaining below 25 taxa except at three sites; a high of 39 taxa was found in Paw Paw Run at RM 4.0. The community responses demonstrated by these streams were consistent with streams impacted by channel modifications and poor land-use practices.

Table 5. Summary of macroinvertebrate data collected from natural substrates (qualitative sampling) in the LaRue Farms study area, 1995.

	Qualitative Evaluation				
Stream River Mile	No. Qual. Taxa	Qual. EPT[a]	Relative Density	Predominant Organisms	Narrative Evaluation[b]
McDonald Creek (1995) (WWH existing)					
9.1	16	5	Low-Mod.	Leeches	Low Fair
6.8	26	5	Low-Mod.	Riffle beetles, mayflies, midges	Fair
2.7	19	4	Low	Hydropsychid caddisflies, damselflies, midges	Low Fair
Little Sandusky River (1995) (WWH existing)					
3.7	11	3	Low	Midges, mayflies	Poor
U.T. to Little Sandusky River (1995)					
0.9	13	0	Low	Damselflies	Poor

Table 5. Continued.

			Qualitative Evaluation		
Stream River Mile	No. Qual. Taxa	Qual. EPT[a]	Relative Density	Predominant Organisms	Narrative Evaluation
Tymochtee Creek (1995) (WWH existing)					
51.6	21	3	Low	Mayflies, hydropsychid caddisflies	Poor
47.2	23	8	Mod.-High	Mayflies, riffle beetles, midges	Fair
42.8	16	6	High	Mayflies	Fair
38.9	23	7	Low-Mod.	Caddisflies, Mayflies	Fair
Blood Run (1995)					
1.4	26	5	Low-Mod.	Hydropsychid caddisflies, leeches, crayfish	Fair
Prairie Run (1995) (WWH existing)					
6.2	15	1	Low	Midges, snails	Poor
1.4	18	3	Low	Mayflies, dragonflies, midges	Poor
Enoch Creek (1995) (WWH existing)					
1.4	24	4	Low	Dragonflies	Poor
Paw Paw Run (1995) (WWH existing)					
4.0	39	5	Low	Caddisflies, mayflies, snails	Fair
0.6	13	3	Low-Mod.	Crayfish, dragonflies	Poor

[a] EPT = total Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) taxa richness.
[b] A qualitative narrative evaluation based on best professional judgement is used when quantitative data is not available to calculate the Invertebrate Community Index (ICI) scores.

Biological Assessment - Fish Communities

Fish communities were evaluated at 17 sites to assess background conditions in streams that will potentially receive land application run-off of chicken manure from AgriGeneral's LaRue Egg Farms. No site sampled met WWH criterion (Table 6). Channelization and poor land-use practices resulted in habitat degradation and nutrient enrichment. Fish communities reflected these conditions. Headwater species were supplanted by pioneering fishes, and species requiring clean gravel substrates to spawn were poorly represented owing to habitat degradation. Nutrient enrichment, combined with poor habitat, was evident in the high percentages of fishes classified as tolerant ($\bar{x}$ 78.4%± 14.1 SD) and omnivorous ($\bar{x}$ 41.3 ± 25.3 SD).

Although none of the fish communities met WWH standards and habitats were commonl y degraded, components of typical WWH fish assemblages were found in several streams, especiall y in the unchannelized lower reaches of the larger creeks. For example, four species of darter , smallmouth bass, brindled madtom, and rosefin shiner were present at RM 2.7 in McDonald Creek. Similarly, Tymochtee Creek at RM 38.9 supported six species of darters, stonecat madtom, rock bass and hog sucker. Pawpaw Run cumulatively harbored twenty-two species of fish, includin g three species of darters and hogsucker. The presence of these remnent W WH faunas suggests that recovery is possible if the present practice of periodic channel maintenance and riparian removal in the upper headwaters is curtailed.

Table 6. Fish community indices based on pulsed D.C. electrofishing samples collected b y Ohio EPA within the upper Scioto River study area 1979-1995.

River Mile	Mean Number Species	Cumulative Species	Mean Rel. No (No./0.3 km)	Mean Rel. Wt. (kg/0.3 km)	QHEI	Mean Miwb[a]	Mean IBI	Narrative Evaluation[b]
McDonald Creek			*Eastern Cornbelt Plain (WWH Existing)*					
9.1	6.5	7	539	--	21.5	--	22*	Poor
6.8	10.5	13	1703	--	60.0	--	23*	Poor
2.7	14.0	19	667	--	64.5	--	25*	Poor
Little Sandusky River			*Eastern Cornbelt Plain (WWH Existing)*					
3.713.5	15	944	9.2	60.5	5.9*	29*	Fair	
U. T. to Little Sandusky River			*Undesignated (WWH Proposed)*					
0.9	11.5	14	858	--	18.0	--	25*	Poor
Tymochtee Creek			*Eastern Cornbelt Plain (WWH Existing)*					
51.6	8.5	10	1020	--	48.5	--	21*	Poor
47.3	14.5	19	269	21.0	51.5	6.0*	30*	Fair
42.8	18.0	25	464	8.4	71.5	6.8*	29*	Fair
38.9	22.5	27	450	22.4	69.5	7.4*	32*	Fair
Blood Run			*Undesignated (WWH Proposed)*					
1.4	3.5	4	269	--	54.5	--	19*	Poor
Praire Run			*Eastern Cornbelt Plain (WWH Existing)*					
6.2		12	138	--	19.0	--	32*	Fair
1.1	11.0	12	255	--	37.0	--	23*	Poor
Enoch Creek			*Eastern Cornbelt Plain (WWH Existing)*					
1.4	7.5	9	1625	--	47.0	--	31*	Fair

Table 6. Continued.

River Mile	Mean Number Species	Cumulative Species	Mean Rel. No (No./0.3 km)	Mean Rel. Wt. (kg/0.3 km)	QHEI	Mean Miwb[a]	Mean IBI	Narrative Evaluation[b]
Paw Paw Run			*Eastern Cornbelt Plain (WWH Existing)*					
4.0	12.0	14	757	--	42.5	--	22*	Poor
0.6	17.5	22	658	8.6	69.0	--	26*	Poor
Carrol Ditch			*Eastern Cornbelt Plain (WWH Existing)*					
1.0	--	10	682	--	25.5	--	18*	Poor
Thompson Ditch			*Eastern Cornbelt Plain (WWH Existing)*					
1.7	--	7	62	--	27.0	--	22*	Poor

Ecoregion Biocriteria: Eastern Corn Belt Plain

Site Type	IBI WWH	IBI EWH	IBI MWH[c]	MIwb WWH	MIwb EWH	MIwb MWH[c]
Headwaters	40	50	24			
Wading	40	50	24	8.3	9.4	5.8
Boat	42	48	24	8.5	9.6	6.2

a - MIwb is not applicable to headwater streams with drainage areas $\leq$ 20 mi^2.
ns - Nonsignificant departure from biocriteria ($\leq$4 IBI units or $\leq$0.5 MIwb units).
* - Indicates significant departure from applicable biocriteria (>4 IBI units or >0.5 MIwb units). Underlined scores are in the Poor or Very Poor range.

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Appendix Tables

Table A-1.

Results of chemical, physical, and microbiological sampling conducted in the Scioto River study area during July-September, 1995. Results preceded by a (<) indicate values below the method detection limit, those indicated by a NA had no sample submitted, and those indicated by a (-) were not analyzed due to a lab or field accident.

Scioto River at Hardin C.R. 25 (RM 234.39)

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
950719	0945	19.8	8.7	7.73	7.81	<2.0	NA	<10	27
950731	1000	22.9	8.7	7.73	7.99	<2.0	NA	<10	22
950814	0955	24.4	6.7	7.69	7.84	<2.0	NA	18	17
950823	0950	19.6	8.1	7.84	7.89	<2.0	NA	15	25
950911	0930	11.4	7.6	7.76	7.71	<2.0	NA	12	29
951002	0940	13.3	6.6	7.69	8.10	<2.0	NA	<10	31

Scioto River at Hardin C.R. 190 (RM 231.86)

950719	1000	17.1	8.6	7.94	7.95	<2.0	NA	15	23
950731	1015	20.7	8.3	7.75	7.95	<2.0	NA	15	21
950814	1010	23.1	6.6	7.66	7.79	<2.0	NA	21	17
950823	1005	16.6	8.4	7.86	7.87	<2.0	NA	18	22
950911	0945	11.3	8.6	7.91	7.91	<2.0	NA	<10	27
951002	0955	13.6	7.2	7.92	7.90	<2.0	NA	<10	27

Scioto River at Hardin C.R. 110 (RM 223.05)

950719	1055	23.0	11.4	8.19	8.02	<2.0	NA	16	23
950731	1110	25.1	7.8	7.90	8.02	<2.0	NA	28	21
950814	1100	25.3	6.5	7.78	7.91	<2.0	NA	27	18
950823	1055	20.1	9.9	8.24	8.22	<2.0	NA	23	22
950911	1040	12.2	10.2	8.27	8.21	<2.0	NA	12	24
951002	1055	14.7	8.7	8.30	8.19	<2.0	NA	17	27

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Scioto River at Hardin C.R. 95 (RM 220.05)									
950719	1105	23.6	7.0	8.13	8.20	<2.0	NA	44	27
950731	1125	26.2	6.1	7.93	8.03	<2.0	NA	37	22
950814	1115	25.9	6.0	7.78	7.94	<2.0	NA	30	18
950823	1110	23.0	7.3	8.18	8.20	<2.0	NA	26	24
950911	1055	14.1	8.3	8.25	8.20	<2.0	NA	17	29
951002	1130	16.1	5.5	8.14	8.08	2.6	NA	22	30
Scioto River at Hardin C.R. 106 (RM 216.67)									
950719	1120	23.9	7.4	8.15	8.18	<2.0	NA	26	26
950731	1140	26.4	6.2	7.90	8.05	<2.0	NA	28	21
950814	1130	27.1	5.9	7.84	7.98	<2.0	NA	27	18
950823	1125	21.8	7.6	8.21	8.21	<2.0	NA	18	24
950911	1110	14.8	8.4	8.21	8.19	<2.0	NA	14	28
951002	1145	16.6	5.6	8.12	8.01	2.4	NA	17	31
Scioto River at Hardin C.R. 130 (RM 213.90)									
950719	1135	24.6	7.5	8.26	-	<2.0	NA	23	26
950731	1155	26.4	5.8	7.98	8.07	<2.0	NA	28	21
950814	1145	28.3	6.1	7.89	8.01	<2.0	NA	27	18
950823	1140	23.1	8.4	8.28	8.29	<2.0	NA	20	24
950911	1125	15.9	9.2	8.28	8.24	<2.0	NA	20	27
951002	1200	18.5	6.2	8.15	8.07	3.2	NA	22	31

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Scioto River adjacent Riverside Ave. (RM 212.77)									
950719	1155	24.7	6.9	8.11	8.16	2.4	NA	23	27
950731	1210	26.1	5.0	7.93	8.06	<2.0	NA	31	22
950814	1200	26.4	6.4	7.90	8.03	<2.0	NA	24	21
950823	1155	21.7	7.4	8.23	8.28	<2.0	NA	18	25
950911	1140	14.6	8.1	8.27	8.21	<2.0	NA	20	29
951002	1220	17.4	5.2	8.08	7.99	3.4	NA	17	34
Scioto River upstream Kenton WWTP Outfall 001 (RM 211.42)									
950719	1210	25.2	9.4	8.26	7.68	2.4	NA	23	29
950731	1235	28.5	4.9	8.00	8.17	<2.0	NA	34	22
950814	1220	27.9	6.5	7.89	8.04	<2.0	NA	23	20
950823	1210	23.4	9.4	8.32	8.39	<2.0	NA	18	26
950911	1220	16.2	9.4	8.32	8.27	<2.0	NA	17	32
951002	1245	17.3	7.3	8.23	8.15	<2.0	NA	14	39
Kenton WWTP Effluent at Outfall 001 (RM 211.40)									
950719	1220	19.9	8.4	7.41	8.08	NA	6.6	32	64
950731	1250	21.0	6.7	7.21	7.44	NA	15	59	65
950814	1245	21.6	6.9	7.37	7.79	NA	2.5	51	62
950823	1230	21.4	7.0	7.26	7.86	NA	9.2	32	49
950911	1225	19.9	7.6	7.15	7.28	NA	5.9	38	64
951002	1255	15.3	7.1	7.83	7.34	NA	7.1	34	67

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Scioto River at Kenton WWTP Outfall 001 Mixing Zone (RM 211.39)									
950719	1215	24.6	8.9	8.20	8.17	10	NA	26	42
950731	1240	25.4	5.7	7.78	7.96	10	NA	31	35
950814	1225	25.8	6.7	7.79	8.05	18	NA	35	35
950823	1215	22.5	7.9	8.06	7.38	39	NA	50	59
950911	1210	16.2	8.1	8.32	7.87	9.8	NA	38	50
951002	1305	20.3	7.4	7.19	7.82	2.2	NA	22	54
Scioto River at Hardin C.R. 175 (RM 210.07)									
950719	1300	25.5	7.8	8.17	8.16	2.4	NA	23	32
950731	1325	27.7	4.4	7.93	8.06	<2.0	NA	32	24
950814	1205	27.7	6.2	7.86	7.34	<2.0	NA	30	23
950823	1255	24.2	7.5	8.14	8.24	<2.0	NA	12	29
950911	1250	18.8	7.6	8.10	-	<2.0	NA	20	37
951002	1245	19.7	6.7	8.12	8.12	2.2	NA	14	47
Scioto River at Dudley T.R. 199 (RM 207.26)									
950719	0940	23.0	8.0	8.19	8.27	3.1	NA	26	31
950731	1005	26.1	5.3	7.86	8.05	<2.0	NA	25	24
950814	1210	27.7	5.2	NA	8.04	<2.0	NA	24	22
950823	1245	24.5	7.3	NA	8.22	2.4	NA	26	-
950911	1230	17.4	8.0	8.19	8.18	<2.0	NA	26	42
951002	1215	17.1	6.1	8.04	8.11	<2.0	NA	<10	46
Scioto River at Hardin C.R. 227 (RM 203.36)									
950719	1000	22.0	7.7	8.20	8.28	3.2	NA	15	32
950731	1025	24.6	6.3	7.96	8.06	<2.0	NA	25	23
950814	1150	27.1	5.9	NA	8.12	<2.0	NA	27	22
950823	1230	22.5	8.2	NA	8.19	<2.0	NA	20	-
950911	1215	16.1	8.7	8.25	8.19	<2.0	NA	26	41
951002	1200	17.0	6.6	8.14	8.13	<2.0	NA	14	44

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Scioto River at Montgomery T.R. 30 (RM 192.21)									
950719	1225	25.0	4.5	8.35	8.13	5.7	NA	41	34
950731	1200	25.0	4.4	7.82	7.97	<2.0	NA	39	25
950814	1120	26.7	4.5	NA	7.84	<2.0	NA	27	20
950823	1150	23.5	4.9	NA	7.98	2.1	NA	35	-
950911	1145	16.1	5.2	8.03	8.01	<2.0	NA	23	42
951002	1135	16.4	8.6	7.95	7.98	2.4	NA	20	59
Scioto River adjacent Green Camp T.R. 74-A (RM 179.05)									
950719	1150	24.0	5.0	7.91	7.76	3.7	NA	47	22
950731	1120	25.1	4.9	7.77	7.88	<2.0	NA	27	20
950814	1100	25.9	4.8	NA	7.76	2.0	NA	27	17
950823	1125	23.0	6.0	NA	8.02	2.3	NA	29	-
950911	1120	17.3	8.1	8.29	8.21	4.2	NA	34	43
951002	1105	16.2	6.0	8.18	8.26	4.3	NA	22	53
Scioto River adjacent Marion C.R. 83-F (RM 175.75)									
950719	1130	23.0	5.0	7.74	7.53	3.2	NA	38	18
950731	1100	24.3	4.2	7.61	7.77	<2.0	NA	30	27
950814	1040	25.6	4.6	NA	7.80	2.4	NA	39	20
950823	1100	22.0	5.9	NA	7.88	2.3	NA	-	-
950911	1100	15.9	9.8	7.73	7.86	3.6	NA	34	85
951002	1050	17.2	6.1	7.73	8.00	5.1	NA	42	97
Scioto River at Thompson T.R. 183 (RM 169.25)									
950719	1100	23.0	5.5	7.78	7.64	3.3	NA	44	14
950731	1030	24.5	4.8	7.65	7.82	<2.0	NA	27	26
950814	1015	25.4	5.5	NA	7.76	<2.0	NA	27	19
950823	1040	23.0	7.3	NA	7.94	2.0	NA	23	-
950911	1040	15.7	10.2	8.26	8.23	6.0	NA	34	58
951002	1035	15.9	10.4	8.50	NA	10	NA	34	77

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Scioto River at Ostrander Rd. (RM 160.38)									
950719	1040	21.0	6.0	7.91	7.76	2.7	NA	44	16
950731	1010	24.7	6.3	7.78	7.96	<2.0	NA	30	25
950814	0955	25.0	6.3	NA	7.86	<2.0	NA	21	19
950823	1020	22.0	8.0	NA	8.16	<2.0	NA	15	-
950911	1020	15.8	10.5	8.45	8.14	5.0	NA	20	47
951002	1015	16.9	13.0	8.41	8.44	17	NA	36	60
Scioto River adjacent S.R. 257 at I-270 (RM 145.57)									
950719	1005	26.0	7.2	8.48	8.20	2.2	NA	38	24
950731	0930	26.9	5.8	7.76	8.02	2.3	NA	27	21
950814	0930	26.5	6.9	NA	8.02	<2.0	NA	20	14
950823	0945	24.5	5.2	NA	7.96	<2.0	NA	15	-
950911	0950	16.9	5.5	7.81	7.82	3.8	NA	22	21
951002	0945	17.3	7.9	7.74	8.08	<2.0	NA	11	35
Cottonwood Ditch at S.R. 195 (RM 1.46)									
950719	1025	23.6	6.3	8.11	8.08	5.4	NA	32	71
950731	1040	27.2	2.7	7.72	7.88	2.9	NA	31	55
950814	1030	27.2	3.0	7.67	7.90	2.1	NA	27	40
950823	1030	22.3	6.4	8.37	8.33	5.9	NA	56	82
950911	1010	15.1	3.9	7.95	7.99	2.1	NA	32	123
951002	1025	15.5	3.4	7.89	7.86	4.5	NA	39	142
Cottonwood Ditch at RR Trestle (RM 0.68)									
950719	1040	22.4	4.9	7.81	7.83	7.1	NA	26	62
950731	1055	26.1	3.3	7.58	7.79	4.6	NA	22	49
950814	1045	28.5	3.1	7.67	7.83	3.4	NA	27	32
950823	1040	22.3	6.8	7.95	7.96	10	NA	41	71
950911	1025	16.1	2.4	7.64	7.75	4.7	NA	23	107
951002	1035	16.4	4.0	7.70	7.74	16	NA	34	123

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Taylor Creek at Buck T.R. 180 (RM 4.43)									
950719	1150	20.2	6.2	8.00	8.12	<2.0	NA	<10	23
950731	1210	23.0	6.5	8.09	8.17	<2.0	NA	11	26
950814	1155	24.7	7.3	8.13	8.25	<2.0	NA	18	25
950823	1050	18.5	6.3	8.05	8.24	<2.0	NA	<10	27
950911	1145	12.6	8.7	7.77	8.20	<2.0	NA	11	29
951002	1040	15.0	5.0	7.94	8.01	<2.0	NA	<10	31
Occidental Chemical Corp. Effluent at Outfall 001 (RM 2.10)									
950719	1215	18.3	7.7	7.33	7.55	NA	<2.0	<10	38
950731	1240	24.4	6.8	7.35	7.54	NA	<2.0	12	60
950814	1240	24.8	5.9	7.40	8.00	NA	<2.0	<10	30
950823	1120	20.9	5.8	7.56	7.85	NA	<2.0	<10	-
950911	1215	25.4	6.9	7.36	7.65	NA	<2.0	<10	54
951002	1115	21.9	7.6	7.55	7.99	NA	<2.0	12	103
Taylor Creek at Occidental Chemical Corp. Outfall 001 Mixing Zone (RM 2.09)									
950719	1225	19.2	7.3	7.51	7.63	<2.0	NA	<10	35
950731	1245	25.6	6.3	7.75	7.54	<2.0	NA	<10	54
950814	1245	25.3	6.2	7.70	7.65	<2.0	NA	<10	43
950823	1125	20.8	6.1	7.79	8.08	<2.0	NA	15	30
950911	1225	25.2	7.3	7.58	7.77	<2.0	NA	<10	49
951002	1110	21.2	8.7	7.69	-	-	NA	17	-
Taylor Creek at Hardin C.R. 155 (RM 1.94)									
950719	1248	22.6	7.1	7.71	7.86	<2.0	NA	12	32
950731	1310	25.2	6.6	7.66	7.82	<2.0	NA	<10	42
950814	1305	26.0	5.9	7.84	8.07	<2.0	NA	<10	30
950823	1145	20.8	5.9	7.88	8.09	<2.0	NA	18	33
950911	1255	21.3	7.6	7.53	7.84	<2.0	NA	<10	45
951002	1145	20.0	6.7	7.75	7.78	<2.0	NA	<10	60

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Taylor Creek at S.R. 67 (RM 0.76)									
950719	1255	23.6	8.9	8.12	8.21	5.1	NA	18	34
950731	1330	27.4	9.1	8.15	8.24	2.5	NA	15	39
950814	1345	26.4	7.3	8.16	8.21	<2.0	NA	12	32
950823	1200	21.4	6.8	7.83	8.15	<2.0	NA	15	41
950911	1325	16.1	8.9	7.53	8.13	<2.0	NA	11	53
951002	1150	16.5	5.4	7.96	7.98	<2.0	NA	<10	57
Silver Creek at S.R. 67 (RM 2.32)									
950719	1306	23.3	7.5	7.96	7.95	<2.0	NA	12	18
950731	1340	24.7	6.4	8.10	8.28	<2.0	NA	12	18
950814	1330	28.8	7.3	8.02	8.28	<2.0	NA	15	23
950823	1210	20.2	7.3	8.05	8.33	<2.0	NA	12	22
950911	1310	13.3	8.1	7.51	8.16	2.0	NA	14	20
951002	1210	14.7	3.7	7.94	8.08	4.2	NA	31	23
Panther Creek at Hale T.R. 197 (RM 8.91)									
950719	1120	20.4	5.8	7.85	8.03	2.3	NA	23	46
950731	1140	23.4	4.3	7.75	7.89	2.3	NA	15	63
950814	1115	26.0	5.9	7.99	8.12	<5.0	NA	21	31
950823	1030	18.7	4.7	7.71	8.00	<2.0	NA	15	46
950911	1120	12.0	2.7	7.50	7.73	3.9	NA	23	91
951002	1015	14.2	8.9	8.34	8.21	20	NA	45	177
Panther Creek at Hardin C.R. 200 (RM 5.66)									
950719	1104	20.3	6.6	7.83	8.01	<2.0	NA	26	60
950731	1125	22.5	5.0	7.71	7.87	2.3	NA	12	167
950814	1100	24.7	6.6	8.08	8.17	<5.0	NA	14	36
950823	1020	18.3	6.4	7.92	8.09	<2.0	NA	12	68
950911	1050	12.1	2.9	7.57	7.84	2.4	NA	16	510
951002	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-1. Continued

Date	Time	Temp (°C)	D.O. (mg/L)	pH (field) (S.U.)	pH (lab) (S.U.)	BOD_5 (mg/L)	$cBOD_5$ (mg/L)	COD (mg/L)	Cl^- (mg/L)
Panther Creek at Hardin C.R. 219 (RM 1.80)									
950719	1035	21.2	7.0	7.96	8.11	<2.0	NA	<10	46
950731	1055	24.2	4.9	7.98	8.14	<2.0	NA	22	53
950814	1000	25.1	6.3	8.06	8.19	<2.0	NA	18	32
950823	0935	19.2	5.1	7.97	8.17	<2.0	NA	15	43
950911	1020	12.2	6.5	7.84	8.00	<2.0	NA	26	46
951002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wildcat Creek at Hale T.R. 217 (RM 6.72)									
950719	1050	22.0	8.1	7.75	7.95	2.1	NA	96	85
950731	1110	24.2	7.5	7.65	7.88	<2.0	NA	19	94
950814	1045	26.7	6.6	7.61	7.82	<5.0	NA	21	36
950823	1010	19.3	6.4	7.75	7.94	<2.0	NA	20	69
950911	1030	12.0	7.6	7.60	7.94	<2.0	NA	20	114
951002	0950	13.9	4.3	7.82	7.85	<2.0	NA	20	160
Wildcat Creek at Hardin C.R. 190 (RM 0.49)									
950719	1020	20.9	6.2	7.87	7.99	<2.0	NA	108	34
950731	1040	25.0	5.3	7.91	8.01	<2.0	NA	15	55
950814	1020	25.3	5.4	7.78	8.00	2.2	NA	18	26
950823	0950	18.9	6.0	7.81	8.00	<2.0	NA	18	38
950911	1000	11.2	7.1	8.00	7.97	<2.0	NA	12	36
951002	0930	13.4	2.6	7.72	7.85	4.6	NA	17	36

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Scioto River at Hardin C.R. 25 (RM 234.39)								
950719	793	NA	0.76	<0.02	<0.05	0.3	NA	NA
950731	684	NA	1.98	0.02	<0.05	0.5	NA	NA
950814	591	NA	1.26	0.03	<0.05	0.5	NA	NA
950823	768	NA	0.54	<0.02	<0.05	0.3	NA	NA
950911	879	NA	<0.10	<0.02	<0.05	0.2	NA	NA
951002	926	NA	<0.10	<0.02	<0.05	0.2	NA	NA
Scioto River at Hardin C.R. 190 (RM 231.86)								
950719	904	NA	0.40	<0.02	<0.05	<0.2	NA	NA
950731	768	NA	1.42	<0.02	<0.05	0.6	NA	NA
950814	657	NA	0.90	0.02	<0.05	0.6	NA	NA
950823	874	NA	0.40	<0.02	<0.05	0.3	NA	NA
950911	941	NA	0.13	<0.02	<0.05	<0.2	NA	NA
951002	965	NA	<0.10	<0.02	<0.05	<0.2	NA	NA
Scioto River at Hardin C.R. 110 (RM 223.05)								
950719	902	NA	0.89	0.02	<0.05	0.4	NA	NA
950731	771	NA	1.51	0.04	0.05	0.8	NA	NA
950814	682	NA	1.13	0.04	<0.05	0.8	NA	NA
950823	853	NA	0.39	<0.02	<0.05	0.4	NA	NA
950911	899	NA	<0.10	0.02	<0.05	0.2	NA	NA
951002	897	NA	<0.10	<0.02	<0.05	0.5	NA	NA
Scioto River at Hardin C.R. 95 (RM 220.05)								
950719	923	NA	0.92	0.04	0.05	0.4	NA	NA
950731	756	NA	1.56	0.06	0.12	0.8	NA	NA
950814	678	NA	1.14	0.06	<0.05	0.7	NA	NA
950823	855	NA	0.39	<0.02	<0.05	0.5	NA	NA
950911	924	NA	0.12	0.04	0.10	0.3	NA	NA
951002	920	NA	<0.10	<0.02	<0.05	0.2	NA	NA

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Scioto River at Hardin C.R. 106 (RM 216.67)								
950719	930	NA	0.96	0.03	<0.05	0.4	NA	NA
950731	728	NA	1.76	0.04	0.07	0.8	NA	NA
950814	666	NA	1.24	0.04	<0.05	0.7	NA	NA
950823	843	NA	0.50	<0.02	<0.05	0.4	NA	NA
950911	931	NA	0.12	0.02	<0.05	0.3	NA	NA
951002	926	NA	<0.10	<0.02	<0.05	0.2	NA	NA
Scioto River at Hardin C.R. 130 (RM 213.90)								
950719	907	NA	1.12	0.02	<0.05	0.6	NA	NA
950731	710	NA	1.93	0.04	<0.05	0.8	NA	NA
950814	661	NA	1.30	0.03	<0.05	0.6	NA	NA
950823	827	NA	0.48	<0.02	<0.05	0.4	NA	NA
950911	919	NA	<0.10	<0.02	<0.05	0.3	NA	NA
951002	924	NA	<0.10	<0.02	<0.05	0.3	NA	NA
Scioto River adjacent Riverside Ave. (RM 212.75)								
950719	915	NA	1.01	0.02	<0.05	0.5	NA	NA
950731	723	NA	0.86	0.04	<0.05	0.7	NA	NA
950814	673	NA	1.36	0.04	<0.05	0.6	NA	NA
950823	823	NA	0.53	<0.02	<0.05	0.5	NA	NA
950911	914	NA	<0.10	0.02	<0.05	0.2	NA	NA
951002	943	NA	<0.10	<0.02	<0.05	<0.2	NA	NA
Scioto River upstream Kenton WWTP Outfall 001 (RM 211.42)								
950719	914	NA	0.84	<0.02	<0.05	0.5	<1.00	NA
950731	715	NA	2.01	0.02	<0.05	0.7	1.05	NA
950814	662	NA	1.35	0.04	<0.05	0.6	<1.00	NA
950823	815	NA	0.54	<0.02	<0.05	0.5	1.05	NA
950911	930	NA	<0.10	0.02	<0.05	0.3	1.4	NA
951002	953	NA	<0.10	<0.02	<0.05	<0.2	<1.00	NA

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Kenton WWTP Effluent at Outfall 001 (RM 211.40)								
950719	1200	NA	16.9	0.05	0.68	2.4	1.06	NA
950731	1140	NA	10.9	0.13	1.93	4.0	4.63	NA
950814	1140	NA	8.47	0.19	3.36	5.3	1.10	NA
950823	1020	NA	8.38	0.15	1.14	1.9	1.05	NA
950911	1160	NA	18.7	0.10	0.47	2.0	2.60	NA
951002	1150	NA	16.9	0.05	0.11	1.7	1.10	NA
Scioto River at Kenton WWTP Outfall 001 Mixing Zone (RM 211.39)								
950719	1020	NA	5.93	0.05	0.25	1.3	1.00	NA
950731	846	NA	5.86	0.07	0.58	1.5	2.28	NA
950814	842	NA	4.59	0.11	1.00	1.9	-	NA
950823	1140	NA	13.9	0.15	3.33	5.3	3.33	NA
950911	1060	NA	9.78	0.10	0.62	1.9	1.40	NA
951002	1060	NA	8.51	0.06	<0.05	1.0	1.03	NA
Scioto River at Hardin C.R. 175 (RM 210.07)								
950719	924	NA	1.96	0.03	<0.05	0.5	NA	NA
950731	732	NA	2.56	0.04	0.06	0.8	NA	NA
950814	678	NA	1.65	0.03	<0.05	0.7	NA	NA
950823	832	NA	1.51	<0.02	<0.05	0.5	NA	NA
950911	961	NA	2.69	0.03	<0.05	0.5	NA	NA
951002	1000	NA	3.95	0.04	<0.05	0.5	NA	NA
Scioto River at Dudley T.R. 199 (RM 207.26)								
950719	903	NA	1.41	<0.02	<0.05	0.5	NA	NA
950731	718	NA	2.73	0.05	0.08	1.0	NA	NA
950814	662	NA	1.74	0.04	<0.05	0.6	NA	NA
950823	801	NA	2.40	0.06	0.23	0.8	NA	NA
950911	966	NA	2.74	0.04	<0.05	0.4	NA	NA
951002	1000	NA	2.02	0.02	<0.05	0.4	NA	NA

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Scioto River at Hardin C.R. 227 (RM 203.36)								
950719	900	NA	1.08	<0.02	<0.05	0.7	NA	NA
950731	705	NA	2.97	0.03	<0.05	0.9	NA	NA
950814	652	NA	1.82	0.03	<0.05	0.5	NA	NA
950823	792	NA	2.14	0.03	<0.05	0.5	NA	NA
950911	951	NA	2.40	0.04	<0.05	0.5	NA	NA
951002	998	NA	1.66	0.02	<0.05	0.4	NA	NA
Scioto River at Montgomery T.R. 30 (RM 192.21)								
950719	842	NA	0.22	0.03	<0.05	0.6	NA	NA
950731	662	NA	3.44	0.07	0.10	0.9	NA	NA
950814	618	NA	1.84	0.05	<0.05	0.7	NA	NA
950823	725	NA	1.42	0.04	<0.05	0.4	NA	NA
950911	982	NA	0.88	0.04	0.08	0.5	NA	NA
951002	1040	NA	0.96	0.02	<0.05	0.4	NA	NA
Scioto River adjacent Green Camp T.R. 74-A (RM 179.05)								
950719	614	NA	1.26	0.04	<0.05	0.6	NA	NA
950731	587	NA	3.51	0.05	0.05	0.8	NA	NA
950814	556	NA	1.66	0.03	0.06	0.6	NA	NA
950823	803	NA	0.63	<0.02	<0.05	0.4	NA	NA
950911	903	NA	<0.10	0.02	0.06	0.6	NA	NA
951002	976	NA	0.29	<0.02	<0.05	0.4	NA	NA
Scioto River adjacent Marion C.R. 83-F (RM 175.75)								
950719	454	NA	2.99	0.10	0.09	0.8	NA	NA
950731	623	NA	3.37	0.09	0.13	1.0	NA	NA
950814	551	NA	1.74	0.05	<0.05	0.8	NA	NA
950823	827	NA	-	0.06	-	-	NA	NA
950911	1070	NA	2.44	0.08	0.14	1.1	NA	NA
951002	1120	NA	2.63	0.14	0.32	1.8	NA	NA

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Scioto River at Thompson T.R. 183 (RM 169.25)								
950719	365	NA	3.28	0.09	0.06	1.0	NA	NA
950731	621	NA	3.59	0.06	0.08	0.9	NA	NA
950814	530	NA	1.70	0.04	<0.05	0.6	NA	NA
950823	796	NA	1.14	0.04	<0.05	0.5	NA	NA
950911	956	NA	0.64	0.03	0.06	0.9	NA	NA
951002	1000	NA	1.69	0.03	<0.05	1.4	NA	NA
Scioto River at Ostrander Rd. (RM 160.38)								
950719	420	NA	2.70	0.07	<0.05	0.8	NA	NA
950731	617	NA	3.32	0.02	<0.05	<0.2	NA	NA
950814	545	NA	1.90	0.02	<0.05	0.6	NA	NA
950823	785	NA	1.32	<0.02	<0.05	0.4	NA	NA
950911	916	NA	0.49	0.02	0.06	0.9	NA	NA
951002	843	NA	<0.10	<0.02	<0.05	2.0	NA	NA
Scioto River adjacent S.R. 257 at I-270 (RM 145.57)								
950719	604	NA	3.27	0.03	<0.05	0.6	NA	NA
950731	439	NA	2.25	0.03	<0.05	0.8	NA	NA
950814	396	NA	1.87	0.02	<0.05	0.7	NA	NA
950823	499	NA	0.86	0.02	<0.05	0.6	NA	NA
950911	507	NA	0.51	0.04	0.26	0.8	NA	NA
951002	679	NA	0.72	<0.02	<0.05	0.5	NA	NA
Cottonwood Ditch at S.R. 195 (RM 1.46)								
950719	981	NA	0.19	0.05	<0.05	0.7	NA	NA
950731	898	NA	0.34	0.08	0.32	0.8	NA	NA
950814	695	NA	1.01	0.10	0.15	0.8	NA	NA
950823	989	NA	<0.10	<0.02	<0.05	0.7	NA	NA
950911	1450	NA	<0.10	0.04	0.31	0.9	NA	NA
951002	1520	NA	<0.10	0.04	0.13	0.9	NA	NA

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Cottonwood Ditch at RR Trestle (RM 0.68)								
950719	1030	NA	0.31	0.17	0.91	1.7	NA	NA
950731	898	NA	0.28	0.14	1.13	1.4	NA	NA
950814	698	NA	0.97	0.17	0.40	1.0	NA	NA
950823	1030	NA	0.12	0.15	1.20	2.4	NA	NA
950911	1580	NA	0.43	0.42	3.58	4.5	NA	NA
951002	1430	NA	1.08	0.29	1.42	2.3	NA	NA
Taylor Creek at Buck T.R. 180 (RM 4.43)								
950719	773	<5	0.49	<0.02	<0.05	0.2	<1.00	<10
950731	792	<5	1.03	<0.02	<0.05	0.4	1.21	<10
950814	754	<5	1.87	0.02	<0.05	0.4	1.9	<10
950823	846	<5	0.43	<0.02	<0.05	<0.2	<1.00	<10
950911	819	<5	0.12	0.02	<0.05	0.2	<1.00	<10
951002	823	<5	<0.10	<0.02	<0.05	<0.2	<1.00	<10
Occidental Chemical Corp. Effluent at Outfall 001 (RM 2.10)								
950719	1120	<5	<0.10	<0.02	0.24	0.3	<1.00	<10
950731	1180	<5	<0.10	<0.02	0.41	0.5	<1.00	14
950814	798	<5	0.13	0.06	0.67	0.9	<1.00	84
950823	1060	<5	0.27	<0.02	<0.05	<0.2	<1.00	<10
950911	1120	<5	0.10	0.02	0.10	0.2	1.68	<10
951002	1300	<5	<0.10	<0.02	0.12	<0.2	<1.00	<10
Taylor Creek at Occidental Chemical Corp. Outfall 001 Mixing Zone (RM 2.09)								
950719	1010	<10	0.34	0.02	0.19	0.4	<1.00	<10
950731	1130	<5	0.68	<0.02	0.26	0.6	<1.00	<10
950814	1010	<5	1.10	0.03	0.42	0.8	1.14	21
950823	826	<5	0.95	0.10	0.10	0.4	<1.00	<10
950911	1010	<5	0.23	0.04	0.10	0.3	<1.00	16
951002	-	<5	<0.10	-	0.08	0.2	<1.00	<10

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Taylor Creek at Hardin C.R. 155 (RM 1.94)								
950719	945	NA	0.46	0.04	0.15	0.4	NA	NA
950731	961	NA	0.81	0.04	0.19	0.8	NA	NA
950814	782	NA	1.63	0.06	0.17	0.5	NA	NA
950823	853	NA	0.86	0.06	0.14	0.4	NA	NA
950911	989	NA	0.24	0.03	0.05	0.3	NA	NA
951002	1120	NA	<0.10	<0.02	0.06	<0.2	NA	NA
Taylor Creek at S.R. 67 (RM 0.76)								
950719	956	NA	0.39	<0.02	0.06	0.4	NA	NA
950731	920	NA	0.93	0.03	0.10	0.6	NA	NA
950814	784	NA	1.80	0.07	0.08	0.6	NA	NA
950823	924	NA	0.82	0.03	0.06	0.3	NA	NA
950911	951	NA	0.34	0.02	<0.05	0.4	NA	NA
951002	1090	NA	<0.10	<0.02	<0.05	0.2	NA	NA
Silver Creek at S.R. 67 (RM 2.32)								
950719	720	NA	<0.10	<0.02	<0.05	0.4	NA	NA
950731	692	NA	0.32	0.02	0.06	0.6	NA	NA
950814	663	NA	1.40	<0.02	<0.05	0.4	NA	NA
950823	755	NA	0.11	<0.02	<0.05	0.2	NA	NA
950911	726	NA	<0.10	0.02	0.10	0.4	NA	NA
951002	744	NA	<0.10	<0.02	0.07	0.4	NA	NA
Panther Creek at Hale T.R. 197 (RM 8.91)								
950719	748	NA	1.44	<0.02	0.06	0.7	NA	NA
950731	777	NA	0.80	0.02	0.26	0.7	NA	NA
950814	650	NA	2.10	0.06	<0.05	0.7	NA	NA
950823	786	NA	0.94	<0.02	<0.05	0.4	NA	NA
950911	972	NA	0.11	0.04	0.67	1.5	NA	NA
951002	1280	NA	<0.10	<0.02	<0.05	0.9	NA	NA

Table A-1. Continued.

Date	Conductivity (umhos/cm)	F-CN⁻ (ug/L)	NO_3-NO_2 (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Oil&Grease (mg/L)	Phenolics (ug/L)
Panther Creek at Hardin C.R. 200 (RM 5.66)								
950719	812	NA	0.50	<0.02	0.12	0.4	NA	NA
950731	1210	NA	0.23	0.02	0.34	0.6	NA	NA
950814	684	NA	1.93	<0.02	<0.05	0.6	NA	NA
950823	901	NA	0.40	<0.02	0.12	0.4	NA	NA
950911	2380	NA	0.81	0.16	1.65	2.4	NA	NA
951002	NA	NA	NA	NA	NA	NA	NA	NA
Panther Creek at Hardin C.R. 219 (RM 1.80)								
950719	761	NA	0.45	<0.02	<0.05	0.4	NA	NA
950731	762	NA	<0.10	<0.02	<0.05	0.4	NA	NA
950814	644	NA	1.93	<0.02	<0.05	0.5	NA	NA
950823	773	NA	0.27	<0.02	<0.05	0.5	NA	NA
950911	759	NA	<0.10	<0.02	<0.05	0.5	NA	NA
951002	NA	NA	NA	NA	NA	NA	NA	NA
Wildcat Creek at Hale T.R. 217 (RM 6.72)								
950719	781	NA	1.15	0.03	<0.05	0.6	NA	NA
950731	791	NA	0.93	0.09	0.07	0.6	NA	NA
950814	581	NA	2.79	0.07	<0.05	0.7	NA	NA
950823	745	NA	0.91	<0.02	<0.05	0.5	NA	NA
950911	959	NA	<0.10	0.02	<0.05	0.5	NA	NA
951002	1090	NA	<0.10	0.02	0.06	0.4	NA	NA
Wildcat Creek at Hardin C.R. 190 (RM 0.49)								
950719	795	NA	0.74	0.03	<0.05	0.4	NA	NA
950731	824	NA	0.64	0.03	0.06	0.6	NA	NA
950814	642	NA	1.76	0.04	<0.05	0.7	NA	NA
950823	815	NA	1.00	0.06	<0.05	0.6	NA	NA
950911	1010	NA	0.28	0.02	<0.05	0.4	NA	NA
951002	1140	NA	<0.10	<0.02	<0.05	<0.2	NA	NA

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Scioto River at Hardin C.R. 25 (RM 234.39)									
950719	<0.05	544	5	114	<2	<0.2	99	<30	<10
950731	-	420	9	80	<2	<0.2	102	<30	<10
950814	0.11	362	<5	64	2	<0.2	82	<30	<10
950823	0.10	502	6	99	<2	<0.2	109	<30	<10
950911	<0.05	560	<5	139	<2	<0.2	132	<30	<10
951002	<0.05	706	5	140	<2	<0.2	128	<30	<10
Scioto River at Hardin C.R. 190 (RM 231.86)									
950719	<0.05	642	10	161	2	<0.2	137	<30	<10
950731	<0.05	524	7	115	<2	<0.2	120	<30	<10
950814	0.11	418	<5	86	2	<0.2	99	<30	<10
950823	0.09	606	<5	147	<2	<0.2	140	<30	<10
950911	<0.05	628	<5	168	<2	<0.2	154	<30	<10
951002	<0.05	700	<5	162	<2	<0.2	145	<30	<10
Scioto River at Hardin C.R. 110 (RM 223.05)									
950719	<0.05	694	50	214	<2	<0.2	136	<30	<10
950731	0.10	530	128	164	2	<0.2	128	<30	<10
950814	0.12	452	26	114	2	<0.2	99	43	<10
950823	0.09	594	18	162	<2	<0.2	135	<30	<10
950911	<0.05	592	27	165	<2	<0.2	151	<30	<10
951002	<0.05	676	50	167	<2	<0.2	128	<30	<10
Scioto River at Hardin C.R. 95 (RM 220.05)									
950719	<0.05	692	98	216	<2	<0.2	126	<30	<10
950731	0.16	516	152	147	3	<0.2	125	<30	<10
950814	0.11	454	61	113	2	<0.2	97	<30	<10
950823	0.12	610	64	164	<2	<0.2	131	<30	<10
950911	<0.05	610	36	207	<2	<0.2	148	<30	<10
951002	<0.05	668	52	212	<2	<0.2	119	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Scioto River at Hardin C.R. 106 (RM 216.67)									
950719	<0.05	968	65	226	2	<0.2	130	<30	<10
950731	0.87	526	85	139	<2	<0.2	116	<30	<10
950814	0.10	458	29	101	<2	<0.2	94	<30	<10
950823	0.10	608	27	164	<2	<0.2	130	<30	<10
950911	<0.05	626	16	203	<2	<0.2	143	<30	<10
951002	<0.05	660	44	214	<2	<0.2	119	<30	<10
Scioto River at Hardin C.R. 130 (RM 213.90)									
950719	<0.05	666	63	230	<2	<0.2	121	<30	<10
950731	0.09	510	72	122	<2	<0.2	112	<30	<10
950814	0.11	466	62	105	<2	<0.2	91	<30	<10
950823	0.10	590	19	157	<2	<0.2	125	<30	<10
950911	<0.05	612	8	203	<2	<0.2	125	<30	<10
951002	<0.05	666	30	216	<2	<0.2	116	<30	<10
Scioto River adjacent Riverside Ave. (RM 212.75)									
950719	0.16	680	64	215	<2	<0.2	118	<30	<10
950731	0.13	516	86	130	<2	<0.2	111	<30	<10
950814	0.21	450	52	105	2	<0.2	91	<30	<10
950823	0.22	568	29	143	<2	<0.2	121	<30	<10
950911	0.18	608	13	197	<2	<0.4	113	<30	<10
951002	0.37	652	17	224	<2	<0.2	117	<30	<10
Scioto River upstream Kenton WWTP Outfall 001 (RM 211.42)									
950719	0.18	684	41	208	4	<0.2	115	<30	<10950731
	0.10	488	57	134	2	0.7	108	<30	<10
950814	0.12	399	53	106	2	<0.2	96	<30	<10
950823	0.20	582	18	154	<2	<0.2	117	<30	<10
950911	0.13	645	10	198	<2	<0.2	97	<30	<10
951002	0.27	656	8	224	<2	<0.2	119	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Kenton WWTP Effluent at Outfall 001 (RM 211.40)									
950719	2.61	774	10	287	<2	<0.2	49	<30	16
950731	2.28	768	13	275	<2	<0.2	71	<30	30
950814	2.04	722	20	296	<2	<0.2	64	<30	<10
950823	1.68	672	18	229	<2	<0.2	88	<30	<10
950911	2.75	812	10	302	<2	<0.2	68	<30	<10
951002	2.67	770	6	354	<2	<0.2	78	<30	<10
Scioto River at Kenton WWTP Outfall 001 Mixing Zone (RM 211.39)									
950719	1.00	676	32	229	5	<0.2	112	<30	<10
950731	0.99	560	63	168	<2	<0.2	90	<30	10
950814	0.89	428	37	167	<2	<0.2	90	<30	<10
950823	2.70	640	21	291	<2	<0.2	69	<30	<10
950911	1.68	740	9	282	<2	<0.2	84	<30	<10
951002	1.49	712	11	316	<2	<0.2	95	<30	<10
Scioto River at Hardin C.R. 175 (RM 210.07)									
950719	0.32	656	31	219	6	<0.2	115	<30	<10
950731	-	510	86	130	2	<0.2	104	<30	<10950814
	0.20	456	23	105	2	<0.2	89	<30	<10
950823	0.33	560	32	170	<2	<0.2	115	<30	<10
950911	0.47	676	28	202	<2	<0.2	109	<30	<10
951002	0.78	672	12	243	<2	<0.2	105	<30	<10
Scioto River at Dudley T.R. 199 (RM 207.26)									
950719	0.24	640	28	213	4	<0.2	110	<30	<10
950731	0.23	492	84	126	2	<0.2	103	<30	12
950814	0.18	438	47	108	2	<0.2	91	<30	<10
950823	0.32	536	33	142	<2	<0.2	99	<30	<10
950911	0.50	644	18	226	<2	<0.2	103	<30	<10
951002	0.45	710	16	234	<2	<0.2	120	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Scioto River at Hardin C.R. 227 (RM 203.36)									
950719	0.21	646	18	220	5	<0.2	114	<30	<10
950731	0.22	496	62	129	2	<0.2	100	<30	11
950814	0.18	404	42	102	2	<0.2	86	<30	<10
950823	0.23	522	14	129	<2	<0.2	96	<30	<10
950911	0.39	640	10	222	<2	<0.2	102	<30	<10
951002	0.34	702	9	229	<2	<0.2	124	<30	<10
Scioto River at Montgomery T.R. 30 (RM 192.21)									
950719	0.22	582	99	191	<2	<0.2	97	<30	<10
950731	-	442	122	110	3	<0.2	94	<30	<10
950814	0.19	390	41	85	2	<0.2	86	<30	<10
950823	0.20	468	90	104	<2	<0.2	91	<30	<10
950911	0.26	684	52	192	2	<0.2	93	<30	<10
951002	0.19	742	48	221	<2	<0.2	120	<30	<10
Scioto River adjacent Green Camp T.R. 74-A (RM 179.05)									
950719	0.16	460	77	87	4	<0.2	80	<30	<10
950731	-	386	99	82	<2	<0.2	83	<30	<10
950814	0.15	354	59	66	3	<0.2	78	<30	<10
950823	0.14	532	92	119	2	<0.2	107	<30	<10
950911	0.23	614	46	159	2	<0.2	115	<30	<10
951002	0.09	704	50	212	<2	<0.2	119	<30	<10
Scioto River adjacent Marion C.R. 83-F (RM 175.75)									
950719	0.22	344	124	54	3	<0.2	60	<30	<10
950731	-	422	93	91	<2	0.2	72	<30	<10
950814	0.19	348	58	64	2	<0.2	75	<30	<10
950823	-	536	31	115	<2	<0.2	98	<30	<10
950911	1.02	712	44	194	3	0.2	98	<30	<10
951002	1.40	714	33	197	2	<0.2	97	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Scioto River at Thompson T.R. 183 (RM 169.25)									
950719	0.26	304	127	43	2	<0.2	46	<30	<10
950731	-	412	81	94	2	<0.2	85	<30	<10
950814	0.18	334	22	60	<2	<0.2	72	<30	<10
950823	0.17	516	48	109	2	<0.2	101	<30	<10
950911	0.36	623	40	164	3	<0.2	102	<30	<10
951002	0.65	676	40	177	2	<0.2	107	<30	<10
Scioto River at Ostrander Rd. (RM 160.38)									
950719	0.24	330	131	57	3	<0.2	53	<30	<10
950731	-	396	59	89	<2	<0.2	85	<30	<10
950814	0.17	328	46	43	2	<0.2	73	<30	<10
950823	0.16	506	19	104	2	<0.2	101	<30	<10
950911	0.23	622	22	164	<2	<0.2	102	<30	<10
951002	0.24	580	36	172	<2	<0.2	85	<30	<10
Scioto River adjacent S.R. 257 at I-270 (RM 145.57)									
950719	0.08	436	14	88	2	<0.2	76	<30	<10
950731	-	257	16	60	<2	<0.2	55	<30	40
950814	0.12	236	10	40	2	<0.2	52	<30	14
950823	0.06	320	7	57	<2	<0.2	61	<30	<10
950911	0.23	354	13	74	3	0.4	53	<30	<10
951002	<0.05	482	<5	110	<2	<0.2	87	20	19
Cottonwood Ditch at S.R. 195 (RM 1.46)									
950719	0.18	707	74	182	8	<0.2	110	<30	<10
950731	0.26	584	85	151	7	<0.2	112	<30	<10
950814	0.13	458	102	104	3	<0.2	89	<30	<10
950823	0.26	682	108	196	-	<0.2	104	<30	<10
950911	0.14	972	44	288	6	<0.2	158	<30	<10
951002	0.10	1080	46	442	4	<0.2	131	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Cottonwood Ditch at RR Trestle (RM 0.68)									
950719	0.26	708	24	204	5	<0.2	118	<30	<10
950731	0.29	598	20	162	7	<0.2	113	<30	<10
950814	0.21	448	15	112	3	<0.2	88	<30	<10
950823	0.36	658	41	172	4	<0.2	115	<30	<10
950911	0.32	904	8	306	4	<0.2	146	<30	<10
951002	0.35	1030	45	403	3	<0.2	127	<30	<10
Taylor Creek at Buck T.R. 180 (RM 4.43)									
950719	<0.05	578	10	130	4	<0.2	99	<30	<10
950731	<0.05	512	6	122	<2	<0.2	106	<30	15
950814	<0.05	478	<5	104	<2	<0.2	107	<30	<10
950823	<0.05	586	<5	139	<2	<0.2	121	<30	<10
950911	0.06	594	<5	149	<2	<0.2	111	<30	<10
951002	<0.05	576	<5	150	2	<0.2	103	<30	<10
Occidental Chemical Corp. Effluent at Outfall 001 (RM 2.10)									
950719	3.04	762	<5	307	4	<0.2	102	<30	<10
950731	3.12	698	<5	113	<2	<0.2	83	<30	<10
950814	3.95	506	21	130	<2	<0.2	92	<30	<10
950823	2.84	714	<5	272	<2	<0.2	118	<30	<10
950911	4.11	790	<5	318	<2	<0.2	109	<30	<10
951002	9.51	860	<5	336	3	<0.2	108	<30	<10
Taylor Creek at Occidental Chemical Corp. Outfall 001 Mixing Zone (RM 2.09)									
950719	1.79	684	8	250	<2	<0.2	101	<30	<10
950731	1.42	714	<5	285	<2	<0.2	96	<30	<10
950814	2.07	636	<5	278	<2	<0.2	94	<30	<10
950823	0.09	595	8	140	<2	<0.2	112	<30	<10
950911	2.58	708	<5	278	<2	<0.2	94	<30	<10
951002	5.48	-	-	-	3	<0.2	106	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Taylor Creek at Hardin C.R. 155 (RM 1.94)									
950719	1.66	634	6	218	3	<0.2	98	<30	<10
950731	1.20	616	5	171	<2	<0.2	96	<30	<10
950814	0.96	470	5	118	<2	<0.2	100	<30	<10
950823	0.70	586	8	137	2	<0.2	112	<30	<10
950911	2.40	700	24	225	<2	<0.2	97	<30	<10
951002	4.68	752	<5	280	3	<0.2	113	<30	<10
Taylor Creek at S.R. 67 (RM 0.76)									
950719	1.41	642	20	216	5	<0.2	100	<30	<10
950731	0.66	602	20	210	2	<0.2	100	<30	<10
950814	0.64	494	<5	128	2	<0.2	96	<30	<10
950823	1.98	608	5	179	2	<0.2	110	<30	<10
950911	2.17	648	6	208	<2	<0.2	97	<30	<10
951002	3.73	724	12	263	4	<0.2	112	<30	<10
Silver Creek at S.R. 67 (RM 2.32)									
950719	0.15	476	19	117	6	<0.2	88	<30	<10
950731	0.05	436	<5	97	2	<0.2	81	<30	<10
950814	<0.05	422	<5	80	2	<0.2	92	<30	<10
950823	<0.05	520	16	108	<2	<0.2	105	<30	<10
950911	0.07	484	10	128	<2	<0.2	77	<30	<10
951002	0.12	484	41	114	3	<0.2	90	<30	<10
Panther Creek at Hale T.R. 197 (RM 8.91)									
950719	0.07	548	38	94	4	<0.2	80	<30	<10
950731	0.08	516	21	96	3	<0.2	76	<30	14
950814	0.11	418	<5	62	3	<0.2	85	<30	<10
950823	0.06	524	<5	85	3	<0.2	92	<30	<10
950911	0.24	614	8	98	5	<0.2	93	<30	<10
951002	0.18	768	46	133	4	<0.2	89	<30	<10

Table A-1. Continued.

Date	T-P (mg/L)	TDS (mg/L)	TSS (mg/L)	SO_4 (mg/L)	T-As (ug/L)	T-Cd (mg/L)	T-Ca (ug/L)	T-Cr (ug/L)	T-Cu (ug/L)
Panther Creek at Hardin C.R. 200 (RM 5.66)									
950719	0.11	564	13	90	4	<0.2	91	<30	<10
950731	0.12	770	8	117	3	<0.2	98	<30	14
950814	0.16	406	<5	69	3	<0.2	89	<30	<10
950823	0.13	594	<5	103	3	<0.2	104	<30	<10
950911	0.51	1400	<5	197	3	0.2	115	<30	<10
951002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Panther Creek at Hardin C.R. 219 (RM 1.80)									
950719	<0.05	540	8	107	5	<0.2	91	<30	<10
950731	-	498	5	102	2	<0.2	86	<30	13
950814	0.14	402	<5	65	3	<0.2	84	30	<10
950823	0.08	516	8	95	3	<0.2	95	<30	<10
950911	0.05	514	<5	86	2	<0.2	85	<30	<10
951002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wildcat Creek at Hale T.R. 217 (RM 6.72)									
950719	0.08	544	20	86	4	<0.2	67	<30	<10
950731	0.17	530	16	80	4	<0.2	61	<30	13
950814	0.06	343	5	56	2	<0.2	66	<30	<10
950823	0.06	474	10	71	2	<0.2	73	<30	<10
950911	<0.05	628	12	92	<2	<0.2	64	<30	<10
951002	<0.05	698	34	98	<2	<0.2	76	<30	<10
Wildcat Creek at Hardin C.R. 190 (RM 0.49)									
950719	<0.05	538	12	160	5	<0.2	90	<30	<10
950731	0.14	568	23	144	3	0.2	85	<30	15
950814	0.10	392	74	79	3	<0.2	83	<30	<10
950823	0.07	562	18	159	<2	<0.2	87	<30	<10
950911	<0.05	722	8	287	<2	<0.2	103	<30	<10
951002	0.09	704	8	360	4	<0.2	116	<30	<10

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Scioto River at Hardin C.R. 25 (RM 234.39)								
950719	428	<2	36	NA	<40	<10	395	1300
950731	405	<2	32	NA	<40	<10	386	NA
950814	661	<2	27	NA	<40	10	316	590
950823	469	<2	36	NA	<40	10	420	NA
950911	894	<2	48	NA	<40	20	527	-
951002	762	<2	44	NA	<40	10	501	NA
Scioto River at Hardin C.R. 190 (RM 231.86)								
950719	616	<2	41	NA	<40	<10	511	410
950731	510	<2	34	NA	<40	<10	440	NA
950814	876	<2	29	NA	<40	10	367	570
950823	605	<2	40	NA	<40	<10	514	NA
950911	433	<2	44	NA	<40	59	566	480
951002	289	<2	42	NA	<40	<10	535	NA
Scioto River at Hardin C.R. 110 (RM 223.05)								
950719	1860	<2	42	NA	<40	11	513	380
950731	3860	<2	36	NA	<40	16	468	NA
950814	4040	<2	29	NA	<40	16	367	600
950823	1450	<2	39	NA	<40	23	498	NA
950911	1310	<2	47	NA	<40	20	571	250
951002	2070	<2	42	NA	<40	14	493	NA
Scioto River at Hardin C.R. 95 (RM 220.05)								
950719	2730	<2	40	NA	<40	20	479	170
950731	5000	<2	36	NA	<40	19	460	NA
950814	3510	<2	29	NA	<40	24	362	530
950823	2690	<2	40	NA	<40	18	492	NA
950911	1510	<2	48	NA	<40	10	567	190
951002	1880	<2	43	NA	<40	18	474	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Scioto River at Hardin C.R. 106 (RM 216.67)								
950719	2140	<2	41	NA	<40	11	493	175
950731	3390	<2	34	NA	<40	13	430	NA
950814	2800	<2	29	NA	<40	17	354	400
950823	1570	<2	39	NA	<40	12	485	NA
950911	696	<2	48	NA	<40	<10	555	90
951002	1460	<2	44	NA	<40	11	478	NA
Scioto River at Hardin C.R. 130 (RM 213.90)								
950719	1820	<2	39	NA	<40	12	463	170
950731	2870	<2	33	NA	<40	12	416	NA
950814	2580	<2	28	NA	<40	14	343	225
950823	1190	<2	38	NA	<40	15	469	NA
950911	425	<2	44	NA	<40	<10	493	60
951002	747	<2	44	NA	<40	12	471	NA
Scioto River adjacent Riverside Ave. (RM 212.75)								
950719	2320	<2	38	NA	<40	14	451	330
950731	3670	3	33	NA	<40	29	413	NA
950814	2320	<2	29	NA	<40	13	347	400
950823	1900	<2	38	NA	<40	20	459	NA
950911	524	<2	40	NA	<40	<10	447	155
951002	630	<2	44	NA	<40	<10	473	NA
Scioto River upstream Kenton WWTP Outfall 001 (RM 211.42)								
950719	1260	<2	38	1.10	<40	12	444	580
950731	2580	<2	32	<0.2	<40	12	401	NA
950814	2580	<2	30	0.7	<40	11	363	430
950823	990	<2	37	6.0	<40	<10	445	NA
950911	372	<2	35	<0.2	<40	<10	386	590
951002	362	<2	44	<0.2	<40	<10	478	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Kenton WWTP Effluent at Outfall 001 (RM 211.40)								
950719	107	<2	19	<0.2	<40	33	201	>60000
950731	166	<2	21	<0.2	<40	33	264	NA
950814	170	<2	27	<0.2	<40	27	271	>60000
950823	920	<2	28	<0.2	<40	40	335	NA
950911	86	<2	17	<0.2	<40	45	240	48000
951002	72	<2	16	<0.2	<40	38	261	NA
Scioto River at Kenton WWTP Outfall 001 Mixing Zone (RM 211.39)								
950719	1020	<2	37	4.0	<40	13	432	39000
950731	1700	<2	27	<0.2	<40	31	336	NA
950814	2160	<2	29	<0.2	<40	11	344	>60000
950823	160	<2	21	<0.2	<40	51	259	NA
950911	254	<2	26	<0.2	<40	21	317	>60000
951002	273	<2	28	<0.2	<40	26	353	NA
Scioto River at Hardin C.R. 175 (RM 210.07)								
950719	1120	<2	38	NA	<40	13	444	540
950731	2830	4	31	NA	<40	12	387	NA
950814	2470	<2	28	NA	<40	12	338	400
950823	1470	<2	36	NA	<40	14	435	NA
950911	743	<2	38	NA	<40	12	429	4400
951002	495	<2	36	NA	<40	26	410	NA
Scioto River at Dudley T.R. 199 (RM 207.26)								
950719	939	<2	36	NA	<40	<10	423	440
950731	3700	3	30	NA	<40	28	380	NA
950814	2770	<2	28	NA	<40	16	343	3600
950823	1320	<2	31	NA	<40	22	375	NA
950911	760	<2	37	NA	<40	<10	410	2000
951002	737	<2	44	NA	<40	10	481	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Scioto River at Hardin C.R. 227 (RM 203.36)								
950719	457	<2	39	NA	<40	<10	445	380
950731	2600	<2	29	NA	<40	15	369	NA
950814	2750	<2	28	NA	<40	18	330	981
950823	657	<2	29	NA	<40	16	359	NA
950911	1400	<2	38	NA	<40	12	411	918
951002	360	<2	46	NA	<40	<10	499	NA
Scioto River at Montgomery T.R. 30 (RM 192.21)								
950719	3910	<2	38	NA	<40	22	399	300
950731	4930	<2	28	NA	<40	45	350	NA
950814	3570	2	27	NA	<40	23	326	590
950823	3600	<2	29	NA	<40	30	347	NA
950911	1850	<2	32	NA	<40	13	364	450
951002	2170	<2	43	NA	<40	10	477	NA
Scioto River adjacent Green Camp T.R. 74-A (RM 179.05)								
950719	3220	<2	26	NA	<40	10	307	460
950731	4380	<2	25	NA	<40	44	310	NA
950814	3200	<2	24	NA	<40	16	294	250
950823	3330	<2	34	NA	<40	14	407	NA
950911	1880	<2	38	NA	<40	<10	444	600
951002	1700	<2	43	NA	<40	<10	474	NA
Scioto River adjacent Marion C.R. 83-F (RM 175.75)								
950719	5460	4	18	NA	<40	24	224	709
950731	3580	2	26	NA	<40	37	287	NA
950814	3040	3	23	NA	<40	27	282	170
950823	1400	2	31	NA	<40	25	372	NA
950911	3220	2	32	NA	<40	44	376	180
951002	1670	<2	35	NA	<40	42	386	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Scioto River at Thopmson T.R. 183 (RM 169.25)								
950719	7090	4	14	NA	<40	34	173	664
950731	3530	3	25	NA	<40	52	315	NA
950814	2570	2	22	NA	<40	18	270	300
950823	2090	<2	31	NA	<40	14	380	NA
950911	1210	<2	34	NA	<40	<10	395	75
951002	1250	<2	38	NA	<40	17	424	NA
Scioto River at Ostrander Rd. (RM 160.38)								
950719	6760	3	17	NA	<40	29	202	550
950731	2670	<2	26	NA	<40	42	319	NA
950814	2070	<2	23	NA	<40	18	277	220
950823	902	<2	32	NA	<40	12	384	NA
950911	488	<2	36	NA	<40	<10	403	50
951002	417	<2	40	NA	<40	12	377	NA
Scioto River adjacent S.R. 257 at I-270 (RM 145.57)								
950719	805	<2	24	NA	<40	<10	287	160
950731	1600	5	18	NA	<40	277	211	NA
950814	810	<2	16	NA	<40	35	196	50
950823	363	<2	21	NA	<40	10	239	NA
950911	666	<2	17	NA	<40	<10	202	450
951002	263	<2	33	NA	<40	31	353	NA
Cottonwood Ditch at S.R. 195 (RM 1.46)								
950719	2670	<2	43	NA	<40	12	452	560
950731	3870	<2	42	NA	<40	13	453	NA
950814	5330	2	31	NA	<40	22	350	854
950823	3960	<2	44	NA	<40	<10	441	NA
950911	1860	<2	70	NA	<40	13	683	1090
951002	1800	<2	63	NA	<40	17	587	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Cottonwood Ditch at RR Trestle (RM 0.68)								
950719	911	<2	42	NA	<40	<10	468	590
950731	1070	<2	41	NA	<40	<10	451	NA
950814	2890	<2	29	NA	<40	16	339	1150
950823	1550	<2	43	NA	<40	<10	464	NA
950911	373	<2	60	NA	<40	<10	612	2900
951002	1100	2	57	NA	<40	13	552	NA
Taylor Creek at Buck T.R. 180 (RM 4.43)								
950719	513	<2	40	NA	<40	<10	412	2400
950731	230	<2	41	NA	<40	<10	424	NA
950814	412	<2	36	NA	<40	<10	415	400
950823	130	<2	43	NA	<40	18	479	NA
950911	154	<2	41	NA	<40	<10	446	882
951002	277	<2	39	NA	<40	12	418	NA
Occidental Chemical Corp. Effluent at Outfall 001 (RM 2.10)								
950719	499	<2	40	NA	<40	15	419	<10
950731	529	<2	28	NA	<40	11	323	NA
950814	467	<2	36	NA	<40	<10	378	954
950823	295	<2	45	NA	<40	18	480	NA
950911	555	<2	37	NA	<40	10	425	<10
951002	225	<2	33	NA	<40	20	406	NA
Taylor Creek at Occidental Chemical Corp. Outfall 001 Mixing Zone (RM 2.09)								
950719	1100	<2	40	NA	<40	19	417	80
950731	711	<2	36	NA	<40	13	388	NA
950814	855	<2	34	NA	<40	10	375	10
950823	639	<2	41	NA	<40	<10	449	NA
950911	404	<2	33	NA	<40	35	371	350
951002	212	<2	36	NA	<40	18	413	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Taylor Creek at Hardin C.R. 155 (RM 1.94)								
950719	462	<2	39	NA	<40	<10	405	230
950731	521	<2	36	NA	<40	<10	388	NA
950814	972	<2	35	NA	<40	<10	394	118
950823	560	<2	42	NA	<40	12	453	NA
950911	312	<2	35	NA	<40	10	386	140
951002	226	<2	39	NA	<40	15	443	NA
Taylor Creek at S.R. 67 (RM 0.76)								
950719	440	<2	41	NA	<40	16	419	722
950731	1600	<2	38	NA	<40	14	406	NA
950814	672	<2	34	NA	<40	<10	380	545
950823	460	<2	40	NA	<40	12	439	NA
950911	306	<2	37	NA	<40	<10	395	110
951002	569	<2	39	NA	<40	14	440	NA
Silver Creek at S.R. 67 (RM 2.32)								
950719	444	<2	42	NA	<40	<10	393	130
950731	291	<2	38	NA	<40	<10	359	NA
950814	746	<2	32	NA	<40	10	362	800
950823	1070	<2	43	NA	<40	<10	439	NA
950911	205	<2	37	NA	<40	<10	345	754
951002	3810	2	46	NA	<40	37	414	NA
Panther Creek at Hale T.R. 197 (RM 8.91)								
950719	376	<2	37	NA	<40	<10	352	945
950731	511	<2	37	NA	<40	<10	342	NA
950814	813	<2	30	NA	<40	<10	336	5800
950823	450	<2	40	NA	<40	<10	394	NA
950911	358	<2	42	NA	<40	<10	405	325
951002	960	<2	42	NA	<40	13	395	NA

Table A-1. Continued.

Date	T-Fe (ug/L)	T-Pb (ug/L)	T-Mg (mg/L)	T-Hg (ug/L)	T-Ni (ug/L)	T-Zn (ug/L)	Hardness (mg/L)	Fecal Coliform (#/100 ml)
Panther Creek at Hardin C.R. 200 (RM 5.66)								
950719	1040	<2	36	NA	<40	<10	375	873
950731	304	<2	38	NA	<40	<10	401	NA
950814	478	<2	30	NA	<40	<10	346	590
950823	365	<2	37	NA	<40	13	412	NA
950911	290	<2	44	NA	<40	12	468	360
951002	NA	NA	NA	NA	NA	NA	NA	NA
Panther Creek at Hardin C.R. 219 (RM 1.80)								
950719	322	<2	35	NA	<40	<10	371	350
950731	369	<2	33	NA	<40	<10	351	NA
950814	673	<2	29	NA	<40	<10	329	280
950823	400	<2	33	NA	<40	17	373	NA
950911	213	<2	34	NA	<40	15	352	30
951002	NA	NA	NA	NA	NA	NA	NA	NA
Wildcat Creek at Hale T.R. 217 (RM 6.72)								
950719	689	<2	34	NA	<40	<10	307	300
950731	825	<2	35	NA	<40	<10	296	NA
950814	702	<2	27	NA	<40	<10	276	30
950823	800	<2	30	NA	<40	13	306	NA
950911	580	<2	33	NA	<40	17	296	40
951002	1290	<2	40	NA	<40	<10	354	NA
Wildcat Creek at Hardin C.R. 190 (RM 0.49)								
950719	824	<2	42	NA	<40	<10	398	932
950731	1500	<2	39	NA	<40	95	373	NA
950814	3000	<2	30	NA	<40	11	331	2000
950823	1770	<2	39	NA	<40	23	378	NA
950911	647	<2	50	NA	<40	<10	463	745
951002	417	<2	55	NA	<40	<10	516	NA

Table A-2. Results of chemical sampling conducted in the Scioto River study area during August 1995 by the Ohio EPA Monitoring and Assessment Section. Results preceded by a (<) indicate values below the method detection limit and those indicated by a (-) were not analyzed. Sites represented by date and time ranges were collected as composite samples.

Date	Time	$cBOD_5$ (mg/L)	$cBOD_{20}$ (mg/L)	Cl^- (mg/L)	NO_3-NO_2 (mg/L)	NO_2 (mg/L)	NH_3 (mg/L)	TKN (mg/L)
Scioto River upstream Kenton WWTP Outfall 001 (RM 211.42)								
950830	1410	2.2	-	33	<0.10	<0.02	<0.05	0.4
Kenton WWTP Effluent at Outfall 001 (RM 211.40)								
950802	1130	9.8	24	-	9.08	0.16	3.08	5.4
Kenton WWTP Effluent at Outfall 001 (RM 211.40)								
950829-30	1050-0950	11	21	62	13.4	0.09	0.68	2.5
Scioto River at Hardin C.R. 175 (RM 210.07)								
950829-30	1315-1215	3.9	8.7	36	1.65	0.02	0.15	0.7
Scioto River at Buck T.R. 179 (RM 209.29)								
950829-30	1415-1215	3.9	9.9	40	1.72	0.02	0.18	0.6
Scioto River at Buck T.R. 187 (RM 208.54)								
950829-30	1227-1127	4.1	9.4	50	1.51	0.02	0.08	0.6
Scioto River at Hardin C.R. 195 (RM 207.74)								
950829-30	1040-0940	4.7	-	39	1.36	0.02	0.06	0.7
Scioto River adjacent Dudley T.R. 146 (RM 206.60)								
950829-30	1400-1300	2.8	-	40	1.19	<0.02	0.06	0.7
Scioto River at Hardin C.R. 265 (RM 205.27)								
950829-30	1505-1405	4.3	9.7	67	0.94	<0.02	0.07	0.7

Table A-2. Continued.

P (mg/L)	TDS (mg/L)	TSS (mg/L)	Cd (μg/L)	Ca (mg/L)	Cr (μg/L)	Cu (μg/L)	Pb (μg/L)	Mg (mg/L)	Ni (μg/L)	Zn (μg/L)
Scioto River upstream Kenton WWTP Outfall 001 (RM 211.42)										
0.23	586	17	<0.2	115	<30	<10	<2	40	<40	<10
Kenton WWTP Effluent at Outfall 001 (RM 211.40)										
1.97	646	<5	0.5	-	<30	28	<2	-	<40	31
Kenton WWTP Effluent at Outfall 001 (RM 211.40)										
2.41	702	11	<0.2	-	<30	14	<2	-	<40	46
Scioto River at Hardin C.R. 175 (RM 210.07)										
0.43	528	40	<0.2	106	<30	<10	<2	37	<40	18
Scioto River at Buck T.R. 179 (RM 209.29)										
0.42	598	64	<0.2	104	<30	<10	<2	36	<40	11
Scioto River at Buck T.R. 187 (RM 208.54)										
0.42	604	44	<0.2	103	<30	<10	<2	-	<40	16
Scioto River at Hardin C.R. 195 (RM 207.74)										
0.35	596	22	<0.2	102	<30	<10	<2	34	<40	<10
Scioto River adjacent Dudley T.R. 146 (RM 206.60)										
0.29	602	15	<0.2	100	<30	<10	<2	34	<40	<10
Scioto River at Hardin C.R. 265 (RM 205.27)										
0.27	624	27	<0.2	102	<30	<10	<2	35	<40	17

Table A-3. Summary of dissolved oxygen measurements recorded with Datasonde© continuous monitors at 8 locations in the Scioto River study area from August 29 to August 31, 1995.

River Mile	**Total Hours**	**Mean** (mg/l)	**Median** (mg/l)	**Minimum** (mg/l)	**Maximum** (mg/l)	**25th %ile** (mg/l)	**75th %ile** (mg/l)
Scioto River							
231.80	47	6.57	6.39	5.85	7.53	6.10	7.15
212.80	49	7.08	7.03	5.57	8.64	6.21	7.93
211.50	46	7.60	6.68	5.00	11.71	5.69	9.74
210.15	45	6.67	7.03	2.84 ‡‡	9.86	4.73 ‡	8.50
208.50	46	8.06	7.94	5.84	10.74	6.46	9.34
205.30	44	7.77	6.84	3.73 ‡‡	14.67	4.77 ‡	10.51
Taylor Creek							
4.40	58	10.04	9.70	6.94	13.92	8.15	11.76
0.80	49	6.81	5.97	3.42 ‡‡	12.46	4.55 ‡	8.95

‡ violation of the average dissolved oxygen (D.O.) criterion.

‡‡ violation of the minimum D.O. criterion.

Table A-4. Estimated concentrations of non-priority organic pollutants detected in the Kenton WWTP and Occidental Chemical Corporation outfall 001 effluents during July - September 1995. Names listed represent the best fit as determined by library identification by computer.

PARAMETER	Kenton WWTP	Occidental Chemical
VOLATILE ORGANIC COMPOUNDS (μg/l or ppb)		
August 14		
Limonene	1.43	ND
SEMI-VOLATILE ORGANIC COMPOUNDS (μg/l or ppb)		
July 19		
2-Propanol, 1-(2-methoxypropoxy)-	1.2	ND
2-Decane, 5-methyl-, (Z)-	2.2	ND
2-Propenal, 3-(2,2,6-trimethyl-7-oxabicyclo [4.1.0] hept-1-yl)	36.2	ND
Dodecanamide, N,N-bis (2-hydroxyethyl)-	1.5	ND
Tetradecanoic acid	2.1	ND
Ethanone, 1-(4,5-diethyl-2-methyl-1-cyclopenten-1-yl)-	4.0	ND
Hexadecanoic acid	20.1	ND
Sulfur, mol. (S8)	3.8	ND
2-Propenal, 3-(2,2,6-trimethyl-7-oxabicyclo [4.1.0] hept-1-yl)	2.8	ND
9-Octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester	12.2	ND
Octadecanoic Acid	18.8	ND
Ethanol, 2-butoxy-, phosphate (3:1)	3.9	ND
Squalene	1.9	ND
Cholestan-3-ol, (3.alpha.)-	1.8	ND
Cholest-5-en-3-ol (3.beta.)-	3.2	ND

Table A-4. Continued

PARAMETER	Kenton WWTP	Occidental Chemical
August 14		
1-Butene, 4-butoxy-	0.7	ND
3-Cyclohexene-1-methanol, .alpha.,.alpha., 4-trimethyl-, (S)-	1.6	ND
2-Propenal, 3-(2,2,6-trimethyl-7-oxabicyclo [4.1.0] hept-1-yl)	12.2	ND
Dodecanamide, N,N-bis (2-hydroxyethyl)-	1.1	ND
Ethanone, 1-(4,5-diethyl-2-methyl-1-cyclopenten-1-yl)-	1.6	ND
Pentadecanoic acid	1.0	ND
1-Hexadecanol	1.1	ND
Hexadecanoic acid	29.4	ND
Ethanol, 2-(hexadecyloxy)-	0.7	ND
Sulfur, mol. (S8)	0.6	0.4
Heptadecanoic acid	1.6	ND
5-Eicosene, (E)-	1.0	ND
Oleic acid, 3-hydroxypropyl ester	8.2	ND
14-Pentadecenoic acid	6.1	ND
Octadecanoic acid	25.0	ND
Squalene	3.8	ND
Cholestan-3-ol, (3.alpha.)-	2.6	ND
Cholest-5-en-3-ol (3.beta.)-	3.6	ND

Table A-4. Continued

PARAMETER	Kenton WWTP	Occidental Chemical
September 11		
2-Propenal, 3-(2,2,6-trimethyl-7-oxabicyclo [4.1.0] hept-1-yl)	22.9	ND
Docecanoic acid	2.5	ND
Tetradecanoic acid	2.3	ND
Ethanone, 1-(4,5-diethyl-2-methyl-1-cyclopenten-1-yl)-	3.2	ND
7-Acetyl-6-ethyl-1,1,4,4-tetramethyltetralin	2.7	ND
Cyclohexadecane	0.9	ND
Oxacycloheptadecan-2-one	3.2	ND
Hexadecanoic acid	16.3	ND
Sulfur, mol. (S8)	5.0	ND
9-Octadecenoic acid (Z)-, 2-hydroxyethyl ester	9.6	ND
Octadecanoic acid	9.5	ND
Squalene	1.1	ND
Cholestane, 2,3-epoxy-, (2.alpha.,3.alpha., 5.alpha.)-	1.7	ND

Table A-5. Estimated dry weight concentrations, by river mile, of non-priority organic pollutants detected in sediments of the Scioto River during 1995. Names listed represent the best fit as determined by library identification by computer. Concentrations are listed for the twenty most prominent compounds. Additional compounds may be present if all twenty are listed (NA). Where less than twenty compounds are listed, no additional compounds were found (ND).

PARAMETER	**213.90**	**212.77**	**211.42**	**210.07**	**207.26**
SEMI-VOLATILE ORGANIC COMPOUNDS (mg/kg or ppm)					
Ethanol, 2,2'-oxybis-, diacetate	3.6	ND	4.0	NA	ND
Dodecane	2.0	ND	ND	NA	1.4
Tridecane	1.7	ND	ND	NA	1.7
Tetradecane	2.1	ND	ND	NA	2.1
Pentadecane	2.0	ND	ND	NA	2.1
Hexadecane	2.2	ND	ND	NA	1.5
Heptadecane	1.8	ND	ND	NA	2.1
Hexadecane, 2,6,10-trimethyl-	2.7	3.0	3.4	NA	ND
9-Hexadecenoic acid	2.2	ND	ND	NA	ND
Hexadecanoic acid	4.3	6.2	ND	9.5	ND
Sulfur, mol. (S8)	7.4	10.2	13.5	10.0	14.8
9-Octadecenoic acid (Z)-, 2-hydroxyethyl	3.1	ND	ND	NA	ND
Tetracosane	1.6	ND	ND	4.1	ND
Hexacosane	3.1	3.5	4.4	7.8	2.2
Octacosane	8.2	7.5	9.0	11.3	3.5
Triacontane	3.0	6.2	2.9	9.5	ND
Stigmast-5-en-3-ol, (3.beta., 24S)-	4.2	4.7	7.7	6.7	3.1
Ethanol, 2,2'-[1,2-ethanediylbis (oxy)] bi	ND	5.1	ND	3.0	ND
Heptadecane, 2,6,10,14-tetramethyl-	ND	1.4	ND	NA	ND

Table A-5. Continued

PARAMETER	213.90	212.77	211.42	210.07	207.26
Oxacycloheptadecan-2-one	ND	2.4	ND	2.9	ND
(Z) 14-Tricosenyl formate	ND	1.4	ND	NA	ND
Cholest-5-en-3-ol (3.beta.)-	ND	3.3	3.4	3.9	ND
D:A-Friedooleanan-3-one	ND	2.0	ND	1.9	ND
Eicosane, 10-methyl-	ND	ND	1.7	1.6	ND
Octadecanoic acid	ND	ND	2.5	4.6	ND
Heptadecane, 2,6-dimethyl-	ND	ND	ND	2.9	ND
Pentacosane	ND	ND	ND	2.9	ND
Heptacosane	ND	ND	ND	2.9	ND
Nonacosane	ND	ND	ND	2.2	ND
Hexadecanal	ND	ND	ND	2.6	ND
Heneicosane, 11-decyl-	ND	ND	ND	2.4	ND
Octadecanal	ND	ND	ND	3.2	ND

Table A-6. Estimated dry weight concentrations, by river mile, of non-priority organic pollutants detected in sediments of Taylor Creek during 1995. Names listed represent the best fit as determined by library identification by computer. Concentrations are listed for the twenty most prominent compounds. Additional compounds may be present if all twenty are listed (NA). Where less than twenty compounds are listed, no additional compounds were found (ND).

PARAMETER	**4.43**	**1.94**	**0.76**
SEMI-VOLATILE ORGANIC COMPOUNDS (mg/kg or ppm)			
Hexadecanoic acid	5.9	11.4	7.1
Sulfur, mol. (S8)	13.2	NA	ND
(Z) 14-Tricosenyl formate	2.1	NA	ND
Hexacosane	3.0	NA	3.4
Tetradecanal	3.3	NA	ND
Octacosane	7.9	8.7	6.0
Hexadecanal	1.7	NA	ND
Triacontane	5.2	NA	ND
Cholest-5-en-3-ol (3.beta.)-	4.0	NA	ND
Stigmast-5-en-3-ol, (3.beta.,24S)-	5.8	7.9	7.1
D:A-Friedooleanan-3-one	2.4	NA	ND
Benzene, ethyl-	ND	64.0	ND
Nonane	ND	10.0	ND
Heptane, 3-ethyl-2-methyl	ND	6.2	ND
Cyclohexane, 2-ethyl-1,3-dimethyl-	ND	6.7	ND
Benzene, 1-ethyl-2-methyl-	ND	17.2	ND
1-Decene, 3,4-dimethyl-	ND	12.1	ND
Cyclohexane, 1-methyl-2-propyl-	ND	17.7	ND
Decane	ND	35.9	ND
2-Butanol, 3-methyl-, acetate	ND	6.8	ND
Nonane, 2,6-dimethyl-	ND	13.4	ND
Tridecane, 6-methyl-	ND	7.4	ND
Dodecane	ND	7.2	ND

Table A-6. Continued

PARAMETER	4.43	1.94	0.76
1-Propene, 2-methyl-, tetramer	ND	18.8	7.1
4-Decene, 2,2-dimethyl-, (Z)-	ND	18.6	ND
1-Propene, 2-methyl-, trimer	ND	18.8	ND
Sulfur, mol. (S8)	ND	32.8	16.6
Cyclohexadecane	ND	6.4	ND
2-Hexene, 5,5-dimethyl-, (Z)-	ND	NA	3.0
(Z) 14-Tricosenyl formate	ND	NA	3.9

Summary of ICI scores for macroinvertebrate community data collected in the upper Scioto River watershed, 1995.

River Mile	Drainage Area (sq mi)	Number of Total Taxa	Number of Mayfly Taxa	Number of Caddisfly Taxa	Number of Dipteran Taxa	Percent: Mayflies	Percent: Caddis-flies	Percent: Tany-tarsini	Percent: Other Dipt/NI	Percent: Tolerant Taxa	Qual. EPT	Eco-region	ICI
SCIOTO RIVER (02-001)													
Year: 95													
234.30	24.2	41(6)	8(6)	4(6)	17(4)	34.2(6)	3.7(4)	23.3(4)	36.9(4)	10.2(4)	17(6)	5	50
231.80	29.0	49(6)	7(4)	7(6)	26(6)	7.4(2)	19.3(6)	33.3(6)	36.8(4)	13.2(4)	13(6)	5	50
222.80 A	73.0	49(6)	11(6)	4(6)	23(6)	57.1(6)	23.0(6)	7.8(2)	10.1(6)	3.2(6)	22(6)	5	56
222.80 B	67.0	50(6)	14(6)	2(4)	26(6)	80.1(6)	0.6(2)	6.5(2)	11.4(6)	1.3(6)	22(6)	5	50
220.80	96.0	47(6)	11(6)	2(4)	26(6)	41.7(6)	2.7(2)	17.3(4)	31.7(4)	1.9(6)	17(6)	5	50
216.60	128.0	45(6)	10(6)	6(6)	22(6)	60.3(6)	23.5(6)	3.3(2)	9.4(6)	0.3(6)	19(6)	5	56
213.90	129.0	61(6)	13(6)	3(4)	32(6)	43.6(6)	4.2(2)	12.8(2)	32.0(4)	1.5(6)	25(6)	5	48
212.80	160.0	53(6)	13(6)	5(6)	24(6)	56.4(6)	5.1(2)	8.1(2)	26.5(6)	1.5(6)	14(4)	5	50
211.50	165.0	50(6)	14(6)	2(2)	23(6)	84.4(6)	1.3(2)	2.5(2)	7.5(6)	1.1(6)	13(4)	5	46
211.30	165.0	49(6)	11(6)	3(4)	27(6)	26.4(4)	5.1(2)	14.1(2)	52.3(2)	13.8(0)	12(4)	5	36
210.10	169.0	49(6)	11(6)	2(2)	26(6)	30.7(4)	11.6(4)	10.1(2)	38.1(4)	5.8(4)	22(6)	5	44
207.70	178.0	51(6)	11(6)	3(4)	28(6)	32.5(6)	20.2(4)	12.8(2)	30.7(4)	5.3(4)	16(6)	5	48
201.30	226.0	47(6)	13(6)	2(2)	24(6)	61.8(6)	9.0(2)	13.4(2)	14.5(6)	0.5(6)	19(6)	5	48
192.20	261.0	29(4)	9(6)	3(4)	12(4)	69.0(6)	16.0(4)	5.2(2)	8.9(6)	0.1(6)	12(4)	5	46
179.60	407.0	35(4)	10(6)	4(4)	14(4)	74.6(6)	6.5(2)	4.6(2)	13.2(6)	0.2(6)	13(4)	5	44
177.20	521.0	28(4)	4(2)	0(0)	18(6)	31.9(6)	0.0(0)	5.7(2)	57.9(0)	12.5(0)	3(0)	5	20
169.20	564.0	34(4)	9(6)	4(4)	14(6)	36.8(6)	56.1(6)	1.2(2)	5.3(6)	0.3(6)	16(4)	5	50
160.50	755.0	37(6)	8(6)	3(4)	19(6)	40.1(6)	26.4(4)	5.0(2)	28.3(4)	1.3(6)	15(4)	5	48
145.80	989.0	26(4)	8(6)	3(4)	7(2)	26.1(6)	31.5(4)	4.3(2)	37.7(0)	0.7(6)	15(4)	5	38
WILDCAT CREEK (02-172)													
Year: 95													
0.50	22.0	35(4)	5(4)	0(0)	21(6)	25.8(6)	0.0(0)	13.7(4)	54.6(2)	7.7(6)	8(4)	5	36
TAYLOR CREEK (02-181)													
Year: 95													
4.50	12.0	49(6)	8(6)	2(4)	27(6)	44.5(6)	1.5(4)	28.1(6)	24.7(6)	2.3(6)	22(6)	5	56
2.00	15.3	31(4)	8(6)	1(2)	20(6)	50.7(6)	3.5(4)	20.7(4)	24.2(6)	1.5(6)	14(6)	5	50
0.70	16.3	37(4)	4(2)	2(4)	17(4)	58.0(6)	0.6(2)	0.0(0)	39.1(4)	14.9(4)	10(4)	5	34
SILVER CREEK (02-182)													
Year: 95													
2.30	13.6	31(4)	6(4)	0(0)	16(4)	17.7(4)	0.0(0)	13.8(4)	67.1(0)	24.5(2)	13(6)	5	28
COTTONWOOD DITCH (02-188)													
Year: 95													
2.50	18.1	41(6)	3(2)	1(2)	17(4)	3.4(2)	1.6(2)	1.3(2)	35.8(4)	11.2(4)	3(0)	5	28
0.70	19.8	38(6)	1(0)	3(6)	21(6)	0.1(2)	0.7(2)	4.8(2)	85.7(0)	23.4(2)	5(2)	5	28

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 234.30

Taxa Code	Taxa	Quant/Qual	
01801	*Turbellaria*	1	
03600	*Oligochaeta*	184	
05900	*Lirceus sp*	9	+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11018	*Acerpenna macdunnoughi*	2	
11020	*Acerpenna pygmaeus*	15	
11120	*Baetis flavistriga*		+
11130	*Baetis intercalaris*	1	+
11651	*Procloeon sp (w/o hindwing pads)*	2	
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*		+
13000	*Leucrocuta sp*		+
13400	*Stenacron sp*	993	+
13590	*Stenonema vicarium*	2	
14950	*Leptophlebia sp or Paraleptophebia sp*	8	
17200	*Caenis sp*	12	+
21200	*Calopteryx sp*	24	+
22001	*Coenagrionidae*		+
22300	*Argia sp*		+
23909	*Boyeria vinosa*	4	+
45300	*Sigara sp*		+
47600	*Sialis sp*		+
50315	*Chimarra obscura*		+
50804	*Lype diversa*	20	+
51400	*Nyctiophylax sp*	27	+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	63	+
52430	*Ceratopsyche morosa group*	1	+
52530	*Hydropsyche depravata group*		+
53800	*Hydroptila sp*		+
58505	*Helicopsyche borealis*		+
59500	*Oecetis sp*		+
60900	*Peltodytes sp*		+
64050	*Liodessus sp*		+
65800	*Berosus sp*	1	+
67000	*Helophorus sp*		+
68601	*Ancyronyx variegata*	1	+
68700	*Dubiraphia sp*	5	
68702	*Dubiraphia bivittata*		+
68707	*Dubiraphia quadrinotata*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	12	+
69200	*Optioservus sp*	1	
69400	*Stenelmis sp*	8	+
72700	*Anopheles sp*		+
77120	*Ablabesmyia mallochi*	158	+
77500	*Conchapelopia sp*	35	+
77800	*Helopelopia sp*	123	+
78140	*Labrundinia pilosella*	16	
78450	*Nilotanypus fimbriatus*	106	
78650	*Procladius sp*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	24	
80370	*Corynoneura lobata*	80	
82880	*Cryptotendipes sp*		+
83840	*Microtendipes pedellus group*	123	
84116	*Paracladopelma nereis*		+
84210	*Paratendipes albimanus or P. duplicatus*		+
84450	*Polypedilum (P.) convictum*		+
84460	*Polypedilum (P.) fallax group*	123	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*	35	+
84612	*Saetheria tylus*		+
85500	*Paratanytarsus sp*	88	+
85615	*Rheotanytarsus distinctissimus group*	35	
85625	*Rheotanytarsus exiguus group*	282	+
85802	*Tanytarsus curticornis group*	70	
85814	*Tanytarsus glabrescens group*	194	+
85840	*Tanytarsus guerlus group*	35	
86100	*Chrysops sp*		+
87540	*Hemerodromia sp*	98	+
95100	*Physella sp*	1	

No. Quantitative Taxa: 41 Total Taxa: 72
No. Qualitative Taxa: 53 ICI: **50**
Number of Organisms: 3022 Qual EPT: 17

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 231.80

Taxa Code	Taxa	Quant/Qual	
00401	*Spongillidae*		+
01801	*Turbellaria*		+
03045	*Fredericella indica*		+
03600	*Oligochaeta*	250	+
05900	*Lirceus sp*	2	
06201	*Hyalella azteca*		+
07840	*Cambarus (Cambarus) sciotensis*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*	8	
11018	*Acerpenna macdunnoughi*	14	
11020	*Acerpenna pygmaeus*	29	
11120	*Baetis flavistriga*	44	+
11130	*Baetis intercalaris*	73	+
11651	*Procloeon sp (w/o hindwing pads)*		+
12200	*Isonychia sp*	1	
13000	*Leucrocuta sp*		+
13400	*Stenacron sp*	81	+
17200	*Caenis sp*	16	+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*		+
23909	*Boyeria vinosa*		+
45300	*Sigara sp*		+
45900	*Notonecta sp*		+
50301	*Chimarra aterrima*	1	
50804	*Lype diversa*	1	+
51400	*Nyctiophylax sp*	1	+
52200	*Cheumatopsyche sp*	570	+
52430	*Ceratopsyche morosa group*	33	+
52440	*Ceratopsyche slossonae*	33	+
52530	*Hydropsyche depravata group*	33	+
59700	*Triaenodes sp*		+
66500	*Enochrus sp*		+
67800	*Tropisternus sp*		+
68601	*Ancyronyx variegata*	2	
68702	*Dubiraphia bivittata*		+
68707	*Dubiraphia quadrinotata*	26	+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	18	+
69225	*Optioservus fastiditus*	35	+
69400	*Stenelmis sp*	32	+
71910	*Tipula abdominalis*	1	
74100	*Simulium sp*	14	+
77120	*Ablabesmyia mallochi*		+
77500	*Conchapelopia sp*	52	+
77800	*Helopelopia sp*	17	
78450	*Nilotanypus fimbriatus*	72	
78600	*Pentaneura inconspicua*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	40	
80370	*Corynoneura lobata*	64	
80420	*Cricotopus (C.) bicinctus*		+
81270	*Nanocladius (N.) spiniplenus*	17	
81632	*Parakiefferiella n.sp 2*		+
81650	*Parametriocnemus sp*	122	+
81825	*Rheocricotopus (Psilocricotopus) robacki*	87	+
82200	*Tvetenia bavarica group*	17	
82820	*Cryptochironomus sp*		+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	35	+
84210	*Paratendipes albimanus or P. duplicatus*		+
84315	*Phaenopsectra flavipes*		+
84440	*Polypedilum (P.) aviceps*	52	
84450	*Polypedilum (P.) convictum*	17	+
84460	*Polypedilum (P.) fallax group*	174	
84470	*Polypedilum (P.) illinoense*		+
84475	*Polypedilum (P.) ophioides*		+
84480	*Polypedilum (P.) laetum group*		+
84520	*Polypedilum (Tripodura) halterale group*	52	
84540	*Polypedilum (Tripodura) scalaenum group*	35	
84612	*Saetheria tylus*		+
84700	*Stenochironomus sp*		+
85261	*Cladotanytarsus vanderwulpi group Type 1*	17	
85500	*Paratanytarsus sp*	70	+
85615	*Rheotanytarsus distinctissimus group*	52	+
85625	*Rheotanytarsus exiguus group*	541	+
85720	*Stempellinella n.sp nr. flavidula*	8	+
85802	*Tanytarsus curticornis group*	297	
85814	*Tanytarsus glabrescens group*	157	
85840	*Tanytarsus guerlus group*	17	
86100	*Chrysops sp*		+
86200	*Tabanus sp*		+
87540	*Hemerodromia sp*	119	+
96900	*Ferrissia sp*	36	+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 231.80

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

No. Quantitative Taxa:	49	Total Taxa:	82
No. Qualitative Taxa:	60	ICI:	**50**
Number of Organisms:	3485	Qual EPT:	13

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 222.80 A

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	28	
01801	*Turbellaria*	2	+
02600	*Nematomorpha*		+
03040	*Fredericella sp*		+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*	28	+
11020	*Acerpenna pygmaeus*	126	+
11120	*Baetis flavistriga*	3	
11130	*Baetis intercalaris*	69	+
11200	*Callibaetis sp*		+
11430	*Diphetor hageni*	6	
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	161	+
13000	*Leucrocuta sp*	54	+
13400	*Stenacron sp*	667	+
13521	*Stenonema femoratum*	2	+
13550	*Stenonema mexicanum integrum*	6	+
13561	*Stenonema pulchellum*	130	+
13570	*Stenonema terminatum*	134	+
14950	*Leptophlebia sp or Paraleptophebia sp*		+
18750	*Hexagenia limbata*		+
21300	*Hetaerina sp*	5	+
22001	*Coenagrionidae*		+
22300	*Argia sp*	1	+
23704	*Anax junius*		+
43300	*Ranatra sp*		+
45100	*Palmacorixa sp*		+
45300	*Sigara sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*		+
51400	*Nyctiophylax sp*		+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	486	+
52430	*Ceratopsyche morosa group*	16	+
52440	*Ceratopsyche slossonae*	11	
52530	*Hydropsyche depravata group*	35	+
53800	*Hydroptila sp*		+
57400	*Neophylax sp*		+
57900	*Pycnopsyche sp*		+
58505	*Helicopsyche borealis*		+
60900	*Peltodytes sp*		+
65800	*Berosus sp*		+
67000	*Helophorus sp*		+
67800	*Tropisternus sp*		+
68601	*Ancyronyx variegata*	1	
68708	*Dubiraphia vittata group*	2	+
68901	*Macronychus glabratus*	20	+
69225	*Optioservus fastiditus*	6	+
69400	*Stenelmis sp*	12	+
71100	*Hexatoma sp*		+
77500	*Conchapelopia sp*	18	
77750	*Hayesomyia senata or Thienemannimyia norena*	7	+
78450	*Nilotanypus fimbriatus*	7	
78650	*Procladius sp*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	4	
80370	*Corynoneura lobata*	7	
80410	*Cricotopus (C.) sp*	11	
80420	*Cricotopus (C.) bicinctus*	64	
81240	*Nanocladius (N.) distinctus*	4	
81250	*Nanocladius (N.) minimus*	4	
81632	*Parakiefferiella n.sp 2*	7	
81825	*Rheocricotopus (Psilocricotopus) robacki*	4	
82101	*Thienemanniella n.sp 1*	4	
82141	*Thienemanniella xena*	4	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	7	
84450	*Polypedilum (P.) convictum*	11	
84460	*Polypedilum (P.) fallax group*		+
84470	*Polypedilum (P.) illinoense*	7	+
84540	*Polypedilum (Tripodura) scalaenum group*	4	
84700	*Stenochironomus sp*		+
85261	*Cladotanytarsus vanderwulpi group Type 1*	4	
85500	*Paratanytarsus sp*	4	
85625	*Rheotanytarsus exiguus group*	110	
85800	*Tanytarsus sp*		+
85802	*Tanytarsus curticornis group*	11	
85814	*Tanytarsus glabrescens group*	57	+
87540	*Hemerodromia sp*	8	
95100	*Physella sp*	1	+
99100	*Pyganodon grandis*		+
99160	*Anodontoides ferussacianus*		+
99420	*Amblema plicata plicata*		+
99860	*Lampsilis radiata luteola*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 222.80 A

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

No. Quantitative Taxa:	49	Total Taxa:	84
No. Qualitative Taxa:	59	ICI:	**56**
Number of Organisms:	2380	Qual EPT:	22

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 222.80 B

Taxa Code	Taxa	Quant/Qual
01320	*Hydra sp*	12
01801	*Turbellaria*	2
11020	*Acerpenna pygmaeus*	118
11120	*Baetis flavistriga*	2
11130	*Baetis intercalaris*	3
11650	*Procloeon sp (w/ hindwing pads)*	22
11651	*Procloeon sp (w/o hindwing pads)*	8
13000	*Leucrocuta sp*	44
13400	*Stenacron sp*	969
13521	*Stenonema femoratum*	11
13550	*Stenonema mexicanum integrum*	5
13570	*Stenonema terminatum*	69
14950	*Leptophlebia sp or Paraleptophebia sp*	6
16700	*Tricorythodes sp*	1
17200	*Caenis sp*	69
18700	*Hexagenia sp*	20
22300	*Argia sp*	16
51001	*Polycentropodidae*	2
52200	*Cheumatopsyche sp*	8
68708	*Dubiraphia vittata group*	3
68901	*Macronychus glabratus*	3
69400	*Stenelmis sp*	1
74501	*Ceratopogonidae*	20
77120	*Ablabesmyia mallochi*	14
77500	*Conchapelopia sp*	3
77740	*Hayesomyia senata*	14
77800	*Helopelopia sp*	24
78140	*Labrundinia pilosella*	8
78650	*Procladius sp*	5
80370	*Corynoneura lobata*	13
80420	*Cricotopus (C.) bicinctus*	8
81632	*Parakiefferiella n.sp 2*	3
82121	*Thienemanniella n.sp 3*	10
82141	*Thienemanniella xena*	5
82730	*Chironomus (C.) decorus group*	3
82820	*Cryptochironomus sp*	3
83040	*Dicrotendipes neomodestus*	14
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	8
84300	*Phaenopsectra obediens group*	3
84460	*Polypedilum (P.) fallax group*	8
85500	*Paratanytarsus sp*	3
85625	*Rheotanytarsus exiguus group*	30
85720	*Stempellinella n.sp nr. flavidula*	1
85800	*Tanytarsus sp*	8
85802	*Tanytarsus curticornis group*	24
85814	*Tanytarsus glabrescens group*	33
85840	*Tanytarsus guerlus group*	11
87540	*Hemerodromia sp*	8
95100	*Physella sp*	2
96900	*Ferrissia sp*	1
99998	*NO QUALITATIVE SAMPLE COLLECTED*	

No. Quantitative Taxa: 50 Total Taxa: 50
No. Qualitative Taxa: 0 ICI: **44**
Number of Organisms: 1681 Qual EPT:

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 220.80

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	132	
01801	*Turbellaria*	4	+
02600	*Nematomorpha*		+
03600	*Oligochaeta*	24	+
05800	*Caecidotea sp*		+
05900	*Lirceus sp*	1	
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11020	*Acerpenna pygmaeus*	30	+
11200	*Callibaetis sp*		+
11250	*Centroptilum sp (w/o hindwing pads)*		+
11650	*Procloeon sp (w/ hindwing pads)*	9	+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	1	
13000	*Leucrocuta sp*	8	+
13400	*Stenacron sp*	508	+
13521	*Stenonema femoratum*	12	+
13550	*Stenonema mexicanum integrum*	3	
13570	*Stenonema terminatum*	49	+
16700	*Tricorythodes sp*	1	+
17200	*Caenis sp*	60	+
18750	*Hexagenia limbata*	18	+
22001	*Coenagrionidae*		+
22300	*Argia sp*	11	+
24900	*Gomphus sp*		+
28500	*Libellula sp*		+
45300	*Sigara sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*	5	+
51206	*Cyrnellus fraternus*		+
51600	*Polycentropus sp*	4	+
52200	*Cheumatopsyche sp*	41	+
53800	*Hydroptila sp*		+
59410	*Nectopsyche diarina*		+
60400	*Gyrinus sp*		+
60900	*Peltodytes sp*		+
63900	*Laccophilus sp*		+
65800	*Berosus sp*		+
67000	*Helophorus sp*		+
68708	*Dubiraphia vittata group*	91	+
68901	*Macronychus glabratus*	3	+
74501	*Ceratopogonidae*	4	
77110	*Ablabesmyia annulata*	7	
77120	*Ablabesmyia mallochi*	13	+
77500	*Conchapelopia sp*	7	
77750	*Hayesomyia senata or Thienemannimyia norena*	101	+
77800	*Helopelopia sp*	13	
78140	*Labrundinia pilosella*	20	
78650	*Procladius sp*		+
80370	*Corynoneura lobata*	52	
81250	*Nanocladius (N.) minimus*	7	
81632	*Parakiefferiella n.sp 2*	7	
82121	*Thienemanniella n.sp 3*	4	
82880	*Cryptotendipes sp*		+
83040	*Dicrotendipes neomodestus*	54	+
83300	*Glyptotendipes (G.) sp*		+
83410	*Harnischia curtilamellata*		+
83840	*Microtendipes pedellus group*		+
84155	*Paralauterborniella nigrohalteralis*	7	+
84210	*Paratendipes albimanus or P. duplicatus*	7	
84460	*Polypedilum (P.) fallax group*	7	
84470	*Polypedilum (P.) illinoense*		+
84520	*Polypedilum (Tripodura) halterale group*		+
84540	*Polypedilum (Tripodura) scalaenum group*	13	
84790	*Tribelos fuscicorne*	34	+
84800	*Tribelos jucundum*	13	
85201	*Cladotanytarsus species group A*	13	
85500	*Paratanytarsus sp*	34	+
85625	*Rheotanytarsus exiguus group*	20	
85720	*Stempellinella n.sp nr. flavidula*	7	
85800	*Tanytarsus sp*	13	
85802	*Tanytarsus curticornis group*	34	
85814	*Tanytarsus glabrescens group*	148	
85840	*Tanytarsus guerlus group*	20	
86100	*Chrysops sp*		+
95100	*Physella sp*		+
98200	*Pisidium sp*		+
99100	*Pyganodon grandis*		+
99180	*Strophitus undulatus undulatus*		+
99240	*Lasmigona complanata*		+
99420	*Amblema plicata plicata*		+
99860	*Lampsilis radiata luteola*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/11/95 River Code: 02-001 River: Scioto River RM: 220.80

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

No. Quantitative Taxa:	47	Total Taxa:	82
No. Qualitative Taxa:	58	ICI:	**50**
Number of Organisms:	1674	Qual EPT:	17

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 216.60

Taxa Code	Taxa	Quant/Qual	
03360	*Plumatella sp*		+
03600	*Oligochaeta*		+
05900	*Lirceus sp*		+
06201	*Hyalella azteca*		+
08601	*Hydracarina*	4	
11020	*Acerpenna pygmaeus*	156	+
11130	*Baetis intercalaris*	1	+
11650	*Procloeon sp (w/ hindwing pads)*		+
11651	*Procloeon sp (w/o hindwing pads)*		+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	157	+
13000	*Leucrocuta sp*	61	+
13400	*Stenacron sp*	509	+
13550	*Stenonema mexicanum integrum*	1	
13561	*Stenonema pulchellum*	41	
13570	*Stenonema terminatum*	778	+
16700	*Tricorythodes sp*	6	+
17200	*Caenis sp*	13	+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*		+
18750	*Hexagenia limbata*		+
21300	*Hetaerina sp*	2	
22001	*Coenagrionidae*		+
22300	*Argia sp*	29	+
24900	*Gomphus sp*		+
45300	*Sigara sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*		+
50315	*Chimarra obscura*		+
51400	*Nyctiophylax sp*	4	+
51600	*Polycentropus sp*	1	+
52200	*Cheumatopsyche sp*	621	+
52430	*Ceratopsyche morosa group*	20	
52530	*Hydropsyche depravata group*	21	
58505	*Helicopsyche borealis*		+
59001	*Leptoceridae*	4	
60400	*Gyrinus sp*		+
60900	*Peltodytes sp*		+
63300	*Hydroporus sp*		+
67000	*Helophorus sp*		+
68130	*Helichus sp*		+
68201	*Scirtidae*		+
68702	*Dubiraphia bivittata*		+
68708	*Dubiraphia vittata group*	5	+
68901	*Macronychus glabratus*	19	+
69400	*Stenelmis sp*	47	+
71100	*Hexatoma sp*		+
77120	*Ablabesmyia mallochi*	6	+
77500	*Conchapelopia sp*	9	+
77740	*Hayesomyia senata*	47	+
77800	*Helopelopia sp*	6	
78450	*Nilotanypus fimbriatus*	24	+
78650	*Procladius sp*	3	+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	4	
80370	*Corynoneura lobata*	80	
81632	*Parakiefferiella n.sp 2*		+
81825	*Rheocricotopus (Psilocricotopus) robacki*	3	
82141	*Thienemanniella xena*	5	
82820	*Cryptochironomus sp*		+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*		+
84450	*Polypedilum (P.) convictum*	50	
84460	*Polypedilum (P.) fallax group*	3	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*	3	+
84700	*Stenochironomus sp*	9	
84750	*Stictochironomus sp*		+
84790	*Tribelos fuscicorne*	3	
85201	*Cladotanytarsus species group A*	3	
85615	*Rheotanytarsus distinctissimus group*	3	
85625	*Rheotanytarsus exiguus group*	62	
85802	*Tanytarsus curticornis group*	6	
85814	*Tanytarsus glabrescens group*	12	+
85840	*Tanytarsus guerlus group*	9	
87540	*Hemerodromia sp*	4	
96900	*Ferrissia sp*	5	+
99100	*Pyganodon grandis*		+
99240	*Lasmigona complanata*		+
99280	*Lasmigona costata*		+
99420	*Amblema plicata plicata*		+
99860	*Lampsilis radiata luteola*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 216.60

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

No. Quantitative Taxa:	45	Total Taxa:	80
No. Qualitative Taxa:	58	ICI:	**56**
Number of Organisms:	2859	Qual EPT:	19

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 213.90

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	12	
01801	*Turbellaria*	8	
03360	*Plumatella sp*		+
03600	*Oligochaeta*	8	+
05900	*Lirceus sp*	2	
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11020	*Acerpenna pygmaeus*	4	+
11130	*Baetis intercalaris*		+
11250	*Centroptilum sp (w/o hindwing pads)*		+
11650	*Procloeon sp (w/ hindwing pads)*	8	+
11651	*Procloeon sp (w/o hindwing pads)*	9	+
11670	*Procloeon irrubrum*	1	+
12200	*Isonychia sp*	3	+
13000	*Leucrocuta sp*	34	+
13400	*Stenacron sp*	386	+
13521	*Stenonema femoratum*		+
13570	*Stenonema terminatum*	104	+
16700	*Tricorythodes sp*	42	+
17100	*Brachycercus sp*		+
17200	*Caenis sp*	133	+
18100	*Anthopotamus sp*	2	+
18600	*Ephemera sp*	1	+
18750	*Hexagenia limbata*	20	+
21200	*Calopteryx sp*	2	
21300	*Hetaerina sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*	18	+
24900	*Gomphus sp*		+
25620	*Stylurus spiniceps*		+
26700	*Macromia sp*	1	
43300	*Ranatra sp*		+
45300	*Sigara sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*	1	+
50315	*Chimarra obscura*		+
51206	*Cyrnellus fraternus*	1	
51300	*Neureclipsis sp*		+
51400	*Nyctiophylax sp*	1	+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	70	+
53800	*Hydroptila sp*		+
58505	*Helicopsyche borealis*		+
59500	*Oecetis sp*		+
60900	*Peltodytes sp*		+
65800	*Berosus sp*	4	
68708	*Dubiraphia vittata group*	66	+
68901	*Macronychus glabratus*	5	+
69400	*Stenelmis sp*	30	+
71100	*Hexatoma sp*		+
74501	*Ceratopogonidae*	8	
77120	*Ablabesmyia mallochi*	117	+
77500	*Conchapelopia sp*		+
77740	*Hayesomyia senata*	45	+
77800	*Helopelopia sp*	19	+
78140	*Labrundinia pilosella*	8	+
78450	*Nilotanypus fimbriatus*	4	
78650	*Procladius sp*	6	+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	4	
80370	*Corynoneura lobata*	68	
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*		+
81250	*Nanocladius (N.) minimus*	19	
82121	*Thienemanniella n.sp 3*	16	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	32	+
83410	*Harnischia curtilamellata*	13	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*		+
83840	*Microtendipes pedellus group*	6	
83900	*Nilothauma sp*	6	
84155	*Paralauterborniella nigrohalteralis*	45	
84210	*Paratendipes albimanus or P. duplicatus*	19	
84300	*Phaenopsectra obediens group*		+
84450	*Polypedilum (P.) convictum*		+
84460	*Polypedilum (P.) fallax group*	6	+
84470	*Polypedilum (P.) illinoense*	6	+
84540	*Polypedilum (Tripodura) scalaenum group*	19	
84700	*Stenochironomus sp*	13	+
84790	*Tribelos fuscicorne*	26	
84800	*Tribelos jucundum*	6	
85201	*Cladotanytarsus species group A*	6	
85265	*Cladotanytarsus vanderwulpi group Type 5*		+
85500	*Paratanytarsus sp*	19	
85615	*Rheotanytarsus distinctissimus group*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 213.90

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
85625	*Rheotanytarsus exiguus group*	+			
85711	*Stempellinella n.sp 1*	6			
85720	*Stempellinella n.sp nr. flavidula*	6			
85800	*Tanytarsus sp*	39			
85802	*Tanytarsus curticornis group*	26			
85814	*Tanytarsus glabrescens group*	78 +			
85840	*Tanytarsus guerlus group*	39			
86100	*Chrysops sp*	+			
87501	*Empididae*	1			
96900	*Ferrissia sp*	5 +			
99100	*Pyganodon grandis*	+			
99180	*Strophitus undulatus undulatus*	+			
99200	*Alasmidonta marginata*	+			
99240	*Lasmigona complanata*	+			
99280	*Lasmigona costata*	+			
99420	*Amblema plicata plicata*	+			
99440	*Fusconaia flava*	+			
99560	*Ptychobranchus fasciolaris*	+			
99860	*Lampsilis radiata luteola*	+			
99880	*Lampsilis ventricosa*	+			

No. Quantitative Taxa: 61 Total Taxa: 103
No. Qualitative Taxa: 75 ICI: **48**
Number of Organisms: 1712 Qual EPT: 25

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 212.80

Taxa Code	Taxa	Quant	Qual
01320	*Hydra sp*	16	
03360	*Plumatella sp*	6	+
03600	*Oligochaeta*	8	+
06201	*Hyalella azteca*		+
11020	*Acerpenna pygmaeus*	5	
11650	*Procloeon sp (w/ hindwing pads)*	3	
11651	*Procloeon sp (w/o hindwing pads)*	8	+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	1	
13000	*Leucrocuta sp*	26	+
13400	*Stenacron sp*	385	+
13521	*Stenonema femoratum*	35	+
13550	*Stenonema mexicanum integrum*	1	
13570	*Stenonema terminatum*	183	+
16700	*Tricorythodes sp*	18	+
17200	*Caenis sp*	95	+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*	1	+
18750	*Hexagenia limbata*	9	+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*	20	+
23909	*Boyeria vinosa*		+
24900	*Gomphus sp*	1	+
28500	*Libellula sp*		+
45100	*Palmacorixa sp*		+
45300	*Sigara sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*	1	+
51206	*Cyrnellus fraternus*	1	
51400	*Nyctiophylax sp*	4	+
51600	*Polycentropus sp*	1	
52200	*Cheumatopsyche sp*	62	+
59400	*Nectopsyche sp*	1	+
60900	*Peltodytes sp*		+
65800	*Berosus sp*	2	+
68708	*Dubiraphia vittata group*	16	+
68901	*Macronychus glabratus*	3	+
69400	*Stenelmis sp*	11	+
77120	*Ablabesmyia mallochi*	18	+
77740	*Hayesomyia senata*	32	
77800	*Helopelopia sp*	14	
78101	*Labrundinia becki*	5	
78140	*Labrundinia pilosella*	14	+
78600	*Pentaneura inconspicua*	5	
78650	*Procladius sp*	9	+
80370	*Corynoneura lobata*	65	
80410	*Cricotopus (C.) sp*	5	
81229	*Nanocladius (N.) crassicornus*	14	
82121	*Thienemanniella n.sp 3*	32	
82141	*Thienemanniella xena*	9	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	32	+
83840	*Microtendipes pedellus group*	14	
83900	*Nilothauma sp*	9	
84315	*Phaenopsectra flavipes*		+
84460	*Polypedilum (P.) fallax group*	5	
84470	*Polypedilum (P.) illinoense*	5	+
84540	*Polypedilum (Tripodura) scalaenum group*	5	+
84750	*Stictochironomus sp*		+
84790	*Tribelos fuscicorne*	36	+
84800	*Tribelos jucundum*		+
85500	*Paratanytarsus sp*		+
85625	*Rheotanytarsus exiguus group*	14	
85700	*Stempellina sp*		+
85800	*Tanytarsus sp*	14	
85802	*Tanytarsus curticornis group*	5	
85814	*Tanytarsus glabrescens group*	59	+
85840	*Tanytarsus guerlus group*	18	
86100	*Chrysops sp*		+
96900	*Ferrissia sp*	3	+
99100	*Pyganodon grandis*		+
99240	*Lasmigona complanata*		+
99440	*Fusconaia flava*		+
99860	*Lampsilis radiata luteola*		+

No. Quantitative Taxa: 53 Total Taxa: 75
No. Qualitative Taxa: 52 ICI: **50**
Number of Organisms: 1364 Qual EPT: 14

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 211.50

Taxa Code	Taxa	Quant	Qual
01320	*Hydra sp*	2	
01801	*Turbellaria*	1	
03360	*Plumatella sp*	1	+
03600	*Oligochaeta*	5	+
05900	*Lirceus sp*	2	+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*	2	
11020	*Acerpenna pygmaeus*	64	
11650	*Procloeon sp (w/ hindwing pads)*	19	
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	25	
13000	*Leucrocuta sp*	215	+
13400	*Stenacron sp*	488	+
13521	*Stenonema femoratum*	2	+
13550	*Stenonema mexicanum integrum*	4	
13561	*Stenonema pulchellum*	9	
13570	*Stenonema terminatum*	1090	+
16700	*Tricorythodes sp*	127	+
17100	*Brachycercus sp*		+
17200	*Caenis sp*	263	+
18100	*Anthopotamus sp*	2	+
18600	*Ephemera sp*	4	+
18750	*Hexagenia limbata*	4	+
22300	*Argia sp*	23	+
24900	*Gomphus sp*		+
45100	*Palmacorixa sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*		+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	35	+
52530	*Hydropsyche depravata group*	1	
60900	*Peltodytes sp*		+
63300	*Hydroporus sp*		+
68601	*Ancyronyx variegata*		+
68708	*Dubiraphia vittata group*	73	+
68901	*Macronychus glabratus*	1	+
69400	*Stenelmis sp*	18	+
74501	*Ceratopogonidae*	2	
77120	*Ablabesmyia mallochi*	27	+
77500	*Conchapelopia sp*	6	
77740	*Hayesomyia senata*	12	+
77800	*Helopelopia sp*	9	+
78140	*Labrundinia pilosella*	16	
78450	*Nilotanypus fimbriatus*	14	
78650	*Procladius sp*		+
79085	*Telopelopia okoboji*	3	
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	2	
80370	*Corynoneura lobata*	30	
80420	*Cricotopus (C.) bicinctus*	3	+
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*	6	
82141	*Thienemanniella xena*	14	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	3	+
83300	*Glyptotendipes (G.) sp*		+
83410	*Harnischia curtilamellata*		+
84155	*Paralauterborniella nigrohalteralis*	12	
84460	*Polypedilum (P.) fallax group*	9	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*	9	+
84790	*Tribelos fuscicorne*	3	+
85201	*Cladotanytarsus species group A*	3	+
85625	*Rheotanytarsus exiguus group*	21	
85720	*Stempellinella n.sp nr. flavidula*		+
85800	*Tanytarsus sp*	12	
85814	*Tanytarsus glabrescens group*	15	+
85840	*Tanytarsus guerlus group*	18	+
86100	*Chrysops sp*		+
95100	*Physella sp*		+
96900	*Ferrissia sp*	14	+
98600	*Sphaerium sp*		+
99100	*Pyganodon grandis*		+
99180	*Strophitus undulatus undulatus*		+
99240	*Lasmigona complanata*		+
99280	*Lasmigona costata*		+
99420	*Amblema plicata plicata*		+
99440	*Fusconaia flava*		+
99860	*Lampsilis radiata luteola*		+

No. Quantitative Taxa: 50 Total Taxa: 78
No. Qualitative Taxa: 56 ICI: **46**
Number of Organisms: 2743 Qual EPT: 13

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/01/95 River Code: 02-001 River: Scioto River RM: 211.39 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
13000	*Leucrocuta sp*	+			
13400	*Stenacron sp*	+			
13570	*Stenonema terminatum*	+			
17200	*Caenis sp*	+			
18600	*Ephemera sp*	+			
21200	*Calopteryx sp*	+			
22001	*Coenagrionidae*	+			
24501	*Gomphidae*	+			
42700	*Belostoma sp*	+			
45300	*Sigara sp*	+			
47600	*Sialis sp*	+			
51600	*Polycentropus sp*	+			
52200	*Cheumatopsyche sp*	+			
53501	*Hydroptilidae*	+			
65800	*Berosus sp*	+			
67000	*Helophorus sp*	+			
68201	*Scirtidae*	+			
68702	*Dubiraphia bivittata*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
77120	*Ablabesmyia mallochi*	+			
77500	*Conchapelopia sp*	+			
80370	*Corynoneura lobata*	+			
82730	*Chironomus (C.) decorus group*	+			
82770	*Chironomus (C.) riparius group*	+			
82820	*Cryptochironomus sp*	+			
83040	*Dicrotendipes neomodestus*	+			
83840	*Microtendipes pedellus group*	+			
84470	*Polypedilum (P.) illinoense*	+			
85814	*Tanytarsus glabrescens group*	+			
95100	*Physella sp*	+			
96900	*Ferrissia sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 34
No. Qualitative Taxa: 34 ICI:
Number of Organisms: 0 Qual EPT: 8

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/12/95 River Code: 02-001 River: Scioto River RM: 211.39 B

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
04964	*Mooreobdella microstoma*	+
12200	*Isonychia sp*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13570	*Stenonema terminatum*	+
16700	*Tricorythodes sp*	+
17200	*Caenis sp*	+
18100	*Anthopotamus sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
24900	*Gomphus sp*	+
45300	*Sigara sp*	+
45400	*Trichocorixa sp*	+
47600	*Sialis sp*	+
52200	*Cheumatopsyche sp*	+
60800	*Haliplus sp*	+
63900	*Laccophilus sp*	+
64050	*Liodessus sp*	+
65800	*Berosus sp*	+
67000	*Helophorus sp*	+
67800	*Tropisternus sp*	+
68601	*Ancyronyx variegata*	+
68700	*Dubiraphia sp*	+
69400	*Stenelmis sp*	+
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	+
77740	*Hayesomyia senata*	+
77800	*Helopelopia sp*	+
78650	*Procladius sp*	+
80420	*Cricotopus (C.) bicinctus*	+
82770	*Chironomus (C.) riparius group*	+
83040	*Dicrotendipes neomodestus*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+
84020	*Parachironomus carinatus*	+
84450	*Polypedilum (P.) convictum*	+
84470	*Polypedilum (P.) illinoense*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
85625	*Rheotanytarsus exiguus group*	+
95100	*Physella sp*	+
96900	*Ferrissia sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 42
No. Qualitative Taxa: 42 ICI:
Number of Organisms: 0 Qual EPT: 9

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 211.30

Taxa Code	Taxa	Quant	Qual
00556	*Ephydatia fluviatilis*		+
01320	*Hydra sp*	40	
02600	*Nematomorpha*		+
03360	*Plumatella sp*		+
03600	*Oligochaeta*	48	+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11130	*Baetis intercalaris*	1	
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	101	
13000	*Leucrocuta sp*	52	+
13400	*Stenacron sp*	386	+
13521	*Stenonema femoratum*	15	+
13550	*Stenonema mexicanum integrum*	5	
13570	*Stenonema terminatum*	229	+
16700	*Tricorythodes sp*	35	+
17200	*Caenis sp*	60	+
18100	*Anthopotamus sp*	1	+
18600	*Ephemera sp*	4	+
18750	*Hexagenia limbata*		+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*	1	+
22300	*Argia sp*	17	+
24900	*Gomphus sp*		+
45400	*Trichocorixa sp*		+
51300	*Neureclipsis sp*	1	
52200	*Cheumatopsyche sp*	164	+
59500	*Oecetis sp*	8	+
60900	*Peltodytes sp*		+
63300	*Hydroporus sp*		+
65800	*Berosus sp*		+
67800	*Tropisternus sp*		+
68708	*Dubiraphia vittata group*	16	+
68901	*Macronychus glabratus*	1	
69400	*Stenelmis sp*	33	+
77120	*Ablabesmyia mallochi*	46	+
77500	*Conchapelopia sp*	15	
77750	*Hayesomyia senata or Thienemannimyia norena*	76	+
77800	*Helopelopia sp*	30	
78140	*Labrundinia pilosella*	46	+
78450	*Nilotanypus fimbriatus*	40	
78650	*Procladius sp*		+
79020	*Tanypus neopunctipennis*		+
80370	*Corynoneura lobata*	56	
80410	*Cricotopus (C.) sp*	183	
80420	*Cricotopus (C.) bicinctus*	15	
80430	*Cricotopus (C.) tremulus group*	61	+
81229	*Nanocladius (N.) crassicornus*	30	
81250	*Nanocladius (N.) minimus*	107	
81632	*Parakiefferiella n.sp 2*		+
82121	*Thienemanniella n.sp 3*	32	
82141	*Thienemanniella xena*	64	
82770	*Chironomus (C.) riparius group*	137	+
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	366	+
84020	*Parachironomus carinatus*	15	+
84155	*Paralauterborniella nigrohalteralis*	15	
84210	*Paratendipes albimanus or P. duplicatus*		+
84300	*Phaenopsectra obediens group*	15	+
84450	*Polypedilum (P.) convictum*	15	
84470	*Polypedilum (P.) illinoense*	91	+
84540	*Polypedilum (Tripodura) scalaenum group*	30	+
84700	*Stenochironomus sp*	15	
84790	*Tribelos fuscicorne*		+
85500	*Paratanytarsus sp*		+
85625	*Rheotanytarsus exiguus group*	61	
85800	*Tanytarsus sp*	15	+
85814	*Tanytarsus glabrescens group*	351	+
85840	*Tanytarsus guerlus group*	46	
89501	*Ephydridae*		+
95100	*Physella sp*		+
96900	*Ferrissia sp*	173	+

No. Quantitative Taxa: 49 Total Taxa: 72
No. Qualitative Taxa: 51 ICI: **36**
Number of Organisms: 3364 Qual EPT: 12

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 210.10

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	20	
01801	*Turbellaria*		+
03360	*Plumatella sp*	9	+
03600	*Oligochaeta*	8	+
08250	*Orconectes (Procericambarus) rusticus*		+
11020	*Acerpenna pygmaeus*	2	
11130	*Baetis intercalaris*	2	+
11200	*Callibaetis sp*		+
11650	*Procloeon sp (w/ hindwing pads)*		+
11651	*Procloeon sp (w/o hindwing pads)*		+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	189	+
13000	*Leucrocuta sp*	97	+
13400	*Stenacron sp*	83	+
13550	*Stenonema mexicanum integrum*	4	+
13561	*Stenonema pulchellum*	9	
13570	*Stenonema terminatum*	534	+
16700	*Tricorythodes sp*	42	+
17200	*Caenis sp*	133	+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*	1	+
18750	*Hexagenia limbata*		+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*	1	+
22300	*Argia sp*	88	+
24900	*Gomphus sp*		+
45100	*Palmacorixa sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*		+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	409	+
52430	*Ceratopsyche morosa group*		+
52530	*Hydropsyche depravata group*		+
53800	*Hydroptila sp*	5	+
59420	*Nectopsyche pavida*		+
59500	*Oecetis sp*		+
60900	*Peltodytes sp*		+
65800	*Berosus sp*		+
67800	*Tropisternus sp*		+
68708	*Dubiraphia vittata group*	23	+
68901	*Macronychus glabratus*	2	
69400	*Stenelmis sp*	226	+
72700	*Anopheles sp*		+
77120	*Ablabesmyia mallochi*	16	+
77355	*Clinotanypus pinguis*		+
77500	*Conchapelopia sp*	31	+
77740	*Hayesomyia senata*	79	+
78450	*Nilotanypus fimbriatus*	163	
78650	*Procladius sp*		+
79020	*Tanypus neopunctipennis*		+
79085	*Telopelopia okoboji*		+
80370	*Corynoneura lobata*	23	
80410	*Cricotopus (C.) sp*	63	
80420	*Cricotopus (C.) bicinctus*	47	
80430	*Cricotopus (C.) tremulus group*	63	+
81229	*Nanocladius (N.) crassicornus*	63	
81250	*Nanocladius (N.) minimus*	47	
81632	*Parakiefferiella n.sp 2*	16	
82121	*Thienemanniella n.sp 3*	12	
82141	*Thienemanniella xena*	19	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	220	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	16	+
84020	*Parachironomus carinatus*	16	
84155	*Paralauterborniella nigrohalteralis*		+
84450	*Polypedilum (P.) convictum*	205	+
84460	*Polypedilum (P.) fallax group*	16	
84470	*Polypedilum (P.) illinoense*	94	+
84540	*Polypedilum (Tripodura) scalaenum group*	63	+
84750	*Stictochironomus sp*		+
85201	*Cladotanytarsus species group A*	16	
85230	*Cladotanytarsus mancus group*		+
85265	*Cladotanytarsus vanderwulpi group Type 5*	16	+
85500	*Paratanytarsus sp*	16	+
85625	*Rheotanytarsus exiguus group*	94	+
85800	*Tanytarsus sp*		+
85814	*Tanytarsus glabrescens group*	205	+
85840	*Tanytarsus guerlus group*	16	
86200	*Tabanus sp*		+
95100	*Physella sp*		+
96900	*Ferrissia sp*	44	+
98200	*Pisidium sp*	8	
99100	*Pyganodon grandis*		+
99160	*Anodontoides ferussacianus*		+
99180	*Strophitus undulatus undulatus*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 210.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
99240	*Lasmigona complanata*	+			
99280	*Lasmigona costata*	+			
99420	*Amblema plicata plicata*	+			

No. Quantitative Taxa: 49 Total Taxa: 88

No. Qualitative Taxa: 70 ICI: **44**

Number of Organisms: 3574 Qual EPT: 22

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 207.70

Taxa Code	Taxa	Quant/Qual	
02600	*Nematomorpha*		+
03360	*Plumatella sp*	1	+
03600	*Oligochaeta*	17	+
05900	*Lirceus sp*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*	16	
11020	*Acerpenna pygmaeus*	103	
11120	*Baetis flavistriga*	2	
11130	*Baetis intercalaris*	41	+
11200	*Callibaetis sp*		+
11650	*Procloeon sp (w/ hindwing pads)*		+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	229	+
13000	*Leucrocuta sp*	130	+
13400	*Stenacron sp*	248	+
13521	*Stenonema femoratum*	3	
13570	*Stenonema terminatum*	597	+
16700	*Tricorythodes sp*	94	+
17200	*Caenis sp*	252	+
18100	*Anthopotamus sp*	2	+
18600	*Ephemera sp*		+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*	44	+
24900	*Gomphus sp*		+
26700	*Macromia sp*		+
28955	*Libellula lydia*		+
45300	*Sigara sp*		+
47600	*Sialis sp*	3	+
50315	*Chimarra obscura*		+
52200	*Cheumatopsyche sp*	1014	+
52430	*Ceratopsyche morosa group*	39	
53800	*Hydroptila sp*	3	+
59410	*Nectopsyche diarina*		+
63900	*Laccophilus sp*		+
67000	*Helophorus sp*		+
68700	*Dubiraphia sp*	6	
68702	*Dubiraphia bivittata*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	3	
69400	*Stenelmis sp*	143	+
77120	*Ablabesmyia mallochi*	24	
77500	*Conchapelopia sp*	72	+
77740	*Hayesomyia senata*	72	+
77800	*Helopelopia sp*	24	
78140	*Labrundinia pilosella*	24	
78450	*Nilotanypus fimbriatus*	285	
78655	*Procladius (Holotanypus) sp*		+
79085	*Telopelopia okoboji*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	16	
80370	*Corynoneura lobata*	72	
80410	*Cricotopus (C.) sp*	48	+
80420	*Cricotopus (C.) bicinctus*	96	
80430	*Cricotopus (C.) tremulus group*	119	
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*	24	
81240	*Nanocladius (N.) distinctus*	48	
82121	*Thienemanniella n.sp 3*	8	
82130	*Thienemanniella similis*	8	
82141	*Thienemanniella xena*	123	
82730	*Chironomus (C.) decorus group*		+
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	72	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	48	+
84040	*Parachironomus frequens*		+
84060	*Parachironomus pectinatellae*		+
84116	*Paracladopelma nereis*		+
84155	*Paralauterborniella nigrohalteralis*	24	
84450	*Polypedilum (P.) convictum*	96	+
84460	*Polypedilum (P.) fallax group*	96	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*	96	+
84601	*Saetheria species 1 (sensu Jackson, 1977)*		+
84750	*Stictochironomus sp*		+
84790	*Tribelos fuscicorne*	48	
85265	*Cladotanytarsus vanderwulpi group Type 5*		+
85625	*Rheotanytarsus exiguus group*	215	+
85800	*Tanytarsus sp*	24	+
85814	*Tanytarsus glabrescens group*	406	+
85840	*Tanytarsus guerlus group*	24	
87540	*Hemerodromia sp*	8	
95100	*Physella sp*		+
96900	*Ferrissia sp*	18	
98200	*Pisidium sp*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 207.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
98600	*Sphaerium sp*	+			
99100	*Pyganodon grandis*	+			
99180	*Strophitus undulatus undulatus*	+			
99240	*Lasmigona complanata*	+			
99280	*Lasmigona costata*	+			
99860	*Lampsilis radiata luteola*	+			

No. Quantitative Taxa: 51 Total Taxa: 89

No. Qualitative Taxa: 63 ICI: **48**

Number of Organisms: 5228 Qual EPT: 16

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 201.30

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	36	
03360	*Plumatella sp*	6	+
03600	*Oligochaeta*		+
07840	*Cambarus (Cambarus) sciotensis*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*	16	
11020	*Acerpenna pygmaeus*	46	
11130	*Baetis intercalaris*	3	+
11200	*Callibaetis sp*		+
11620	*Paracloeodes sp 2*		+
11650	*Procloeon sp (w/ hindwing pads)*	5	+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	217	+
13000	*Leucrocuta sp*	125	+
13400	*Stenacron sp*	466	+
13521	*Stenonema femoratum*	5	+
13550	*Stenonema mexicanum integrum*	3	
13561	*Stenonema pulchellum*	22	
13570	*Stenonema terminatum*	1510	+
16700	*Tricorythodes sp*	47	+
17200	*Caenis sp*	52	+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*	8	+
21300	*Hetaerina sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*	9	+
24900	*Gomphus sp*		+
45300	*Sigara sp*		+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*		+
50315	*Chimarra obscura*		+
52200	*Cheumatopsyche sp*	349	+
52430	*Ceratopsyche morosa group*		+
52530	*Hydropsyche depravata group*		+
52560	*Hydropsyche orris*	18	
53800	*Hydroptila sp*		+
63900	*Laccophilus sp*		+
64800	*Uvarus sp*		+
65800	*Berosus sp*		+
66500	*Enochrus sp*		+
67500	*Laccobius sp*		+
67800	*Tropisternus sp*		+
68708	*Dubiraphia vittata group*	2	+
68901	*Macronychus glabratus*	6	
69400	*Stenelmis sp*	32	+
72501	*Culicidae*		+
74100	*Simulium sp*		+
74501	*Ceratopogonidae*	4	
77120	*Ablabesmyia mallochi*	10	+
77500	*Conchapelopia sp*	19	+
77750	*Hayesomyia senata or Thienemannimyia norena*	19	+
78400	*Natarsia sp*		+
78450	*Nilotanypus fimbriatus*	38	
78655	*Procladius (Holotanypus) sp*		+
79085	*Telopelopia okoboji*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	16	
80370	*Corynoneura lobata*	72	
80410	*Cricotopus (C.) sp*	76	+
80420	*Cricotopus (C.) bicinctus*	10	
80430	*Cricotopus (C.) tremulus group*	29	+
81201	*Nanocladius (N.) sp*		+
82121	*Thienemanniella n.sp 3*	20	
82141	*Thienemanniella xena*	36	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	86	
83840	*Microtendipes pedellus group*	10	
84060	*Parachironomus pectinatellae*		+
84155	*Paralauterborniella nigrohalteralis*	10	
84210	*Paratendipes albimanus or P. duplicatus*		+
84450	*Polypedilum (P.) convictum*	38	+
84460	*Polypedilum (P.) fallax group*	10	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*		+
84750	*Stictochironomus sp*		+
84790	*Tribelos fuscicorne*	19	
85500	*Paratanytarsus sp*	10	
85625	*Rheotanytarsus exiguus group*	219	+
85711	*Stempellinella n.sp 1*		+
85800	*Tanytarsus sp*	10	+
85814	*Tanytarsus glabrescens group*	295	+
85840	*Tanytarsus guerlus group*	10	+
86100	*Chrysops sp*		+
87540	*Hemerodromia sp*	8	
95100	*Physella sp*		+

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/13/95 River Code: 02-001 River: Scioto River RM: 201.30

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
96900	*Ferrissia sp*	2 +			
99100	*Pyganodon grandis*	+			
99240	*Lasmigona complanata*	+			
99280	*Lasmigona costata*	+			
99420	*Amblema plicata plicata*	+			
99540	*Elliptio dilatata*	+			
99860	*Lampsilis radiata luteola*	+			

No. Quantitative Taxa: 47 Total Taxa: 91

No. Qualitative Taxa: 70 ICI: **48**

Number of Organisms: 4059 Qual EPT: 19

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-001 River: Scioto River RM: 192.20

Taxa Code	Taxa	Quant/Qual
01320	*Hydra sp*	+
03040	*Fredericella sp*	+
03360	*Plumatella sp*	2
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11020	*Acerpenna pygmaeus*	19 +
11130	*Baetis intercalaris*	554 +
11670	*Procloeon irrubrum*	+
12200	*Isonychia sp*	36
12912	*Heptagenia diabasia*	3 +
13000	*Leucrocuta sp*	58 +
13400	*Stenacron sp*	306 +
13550	*Stenonema mexicanum integrum*	1
13561	*Stenonema pulchellum*	1
13570	*Stenonema terminatum*	466 +
16700	*Tricorythodes sp*	+
18750	*Hexagenia limbata*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	12 +
24900	*Gomphus sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
51400	*Nyctiophylax sp*	8 +
52200	*Cheumatopsyche sp*	303 +
52570	*Hydropsyche simulans*	23 +
66500	*Enochrus sp*	+
67000	*Helophorus sp*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	6 +
69400	*Stenelmis sp*	1 +
77750	*Hayesomyia senata or Thienemannimyia norena*	7 +
77800	*Helopelopia sp*	3
78140	*Labrundinia pilosella*	8
78450	*Nilotanypus fimbriatus*	15
80370	*Corynoneura lobata*	117
81229	*Nanocladius (N.) crassicornus*	7
81250	*Nanocladius (N.) minimus*	3
81825	*Rheocricotopus (Psilocricotopus) robacki*	10 +
82141	*Thienemanniella xena*	9
82600	*Axarus sp*	+
82820	*Cryptochironomus sp*	+
83840	*Microtendipes pedellus group*	+
84040	*Parachironomus frequens*	3 +
84450	*Polypedilum (P.) convictum*	+
84470	*Polypedilum (P.) illinoense*	+
84750	*Stictochironomus sp*	+
84790	*Tribelos fuscicorne*	+
85625	*Rheotanytarsus exiguus group*	108
85814	*Tanytarsus glabrescens group*	+
87540	*Hemerodromia sp*	1
95100	*Physella sp*	+
96900	*Ferrissia sp*	1
97601	*Corbicula fluminea*	+
99100	*Pyganodon grandis*	+
99240	*Lasmigona complanata*	+
99860	*Lampsilis radiata luteola*	+

No. Quantitative Taxa: 29 Total Taxa: 59
No. Qualitative Taxa: 45 ICI: **46**
Number of Organisms: 2091 Qual EPT: 12

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-001 River: Scioto River RM: 179.60

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	6	
01801	*Turbellaria*	2	
03451	*Urnatella gracilis*		+
03600	*Oligochaeta*		+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*	1	+
08601	*Hydracarina*	2	
11130	*Baetis intercalaris*	27	+
11650	*Procloeon sp (w/ hindwing pads)*	13	+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	4	+
13000	*Leucrocuta sp*	12	+
13400	*Stenacron sp*	740	+
13550	*Stenonema mexicanum integrum*	3	
13561	*Stenonema pulchellum*	14	
13570	*Stenonema terminatum*	487	+
14950	*Leptophlebia sp or Paraleptophebia sp*	5	
17200	*Caenis sp*	2	+
18750	*Hexagenia limbata*		+
22300	*Argia sp*	13	+
45400	*Trichocorixa sp*		+
47600	*Sialis sp*		+
51400	*Nyctiophylax sp*	9	
52200	*Cheumatopsyche sp*	90	+
52560	*Hydropsyche orris*	2	
52570	*Hydropsyche simulans*	13	+
57900	*Pycnopsyche sp*		+
59110	*Ceraclea ancylus*		+
63900	*Laccophilus sp*		+
68708	*Dubiraphia vittata group*	2	+
68901	*Macronychus glabratus*	4	
69400	*Stenelmis sp*		+
77120	*Ablabesmyia mallochi*	43	+
77500	*Conchapelopia sp*	3	
77750	*Hayesomyia senata or Thienemannimyia norena*	30	+
78140	*Labrundinia pilosella*	86	
79085	*Telopelopia okoboji*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	4	
80370	*Corynoneura lobata*	26	
80410	*Cricotopus (C.) sp*		+
80420	*Cricotopus (C.) bicinctus*	3	+
81240	*Nanocladius (N.) distinctus*		+
81825	*Rheocricotopus (Psilocricotopus) robacki*		+
82121	*Thienemanniella n.sp 3*	8	
82600	*Axarus sp*		+
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	3	
83840	*Microtendipes pedellus group*	3	+
84155	*Paralauterborniella nigrohalteralis*	3	+
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*		+
85625	*Rheotanytarsus exiguus group*	77	
85814	*Tanytarsus glabrescens group*	3	
87540	*Hemerodromia sp*	8	
98600	*Sphaerium sp*		+

No. Quantitative Taxa:	35	Total Taxa:	55
No. Qualitative Taxa:	37	ICI:	**44**
Number of Organisms:	1751	Qual EPT:	13

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/07/95 River Code: 02-001 River: Scioto River RM: 177.20

Taxa Code	Taxa	Quant/Qual
00653	*Eunapius fragilis*	+
01801	*Turbellaria*	14
03360	*Plumatella sp*	1
03600	*Oligochaeta*	32 +
11200	*Callibaetis sp*	10 +
13400	*Stenacron sp*	223 +
13521	*Stenonema femoratum*	1
17200	*Caenis sp*	1 +
22001	*Coenagrionidae*	2 +
22300	*Argia sp*	31 +
28955	*Libellula lydia*	+
45400	*Trichocorixa sp*	+
45900	*Notonecta sp*	+
48200	*Chauliodes sp*	+
60800	*Haliplus sp*	+
60900	*Peltodytes sp*	+
67000	*Helophorus sp*	+
68708	*Dubiraphia vittata group*	+
74501	*Ceratopogonidae*	+
77115	*Ablabesmyia janta*	6
77120	*Ablabesmyia mallochi*	+
77750	*Hayesomyia senata or Thienemannimyia norena*	+
78140	*Labrundinia pilosella*	2
78655	*Procladius (Holotanypus) sp*	18 +
80370	*Corynoneura lobata*	2
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*	6
82121	*Thienemanniella n.sp 3*	+
82820	*Cryptochironomus sp*	12 +
83040	*Dicrotendipes neomodestus*	12
83051	*Dicrotendipes simpsoni*	12 +
83300	*Glyptotendipes (G.) sp*	42 +
83840	*Microtendipes pedellus group*	6
84315	*Phaenopsectra flavipes*	6
84460	*Polypedilum (P.) fallax group*	18
84470	*Polypedilum (P.) illinoense*	24 +
84540	*Polypedilum (Tripodura) scalaenum group*	83 +
84790	*Tribelos fuscicorne*	107
84800	*Tribelos jucundum*	18
85500	*Paratanytarsus sp*	18
85814	*Tanytarsus glabrescens group*	24
96900	*Ferrissia sp*	6

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 28 Total Taxa: 41
No. Qualitative Taxa: 25 ICI: **20**
Number of Organisms: 737 Qual EPT: 3

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/07/95 River Code: 02-001 River: Scioto River RM: 169.20

Taxa Code	Taxa	Quant	Qual
01801	*Turbellaria*	2	+
02600	*Nematomorpha*		+
03600	*Oligochaeta*	16	+
06201	*Hyalella azteca*		+
06700	*Crangonyx sp*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11020	*Acerpenna pygmaeus*	42	+
11125	*Labiobaetis frondalis*		+
11130	*Baetis intercalaris*	882	+
11200	*Callibaetis sp*		+
11650	*Procloeon sp (w/ hindwing pads)*		+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	669	+
13000	*Leucrocuta sp*	57	+
13400	*Stenacron sp*	170	+
13521	*Stenonema femoratum*		+
13550	*Stenonema mexicanum integrum*	2	
13561	*Stenonema pulchellum*	542	+
13570	*Stenonema terminatum*	185	
16700	*Tricorythodes sp*		+
17200	*Caenis sp*	34	+
18100	*Anthopotamus sp*		+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*		+
44501	*Corixidae*		+
47600	*Sialis sp*		+
48410	*Corydalus cornutus*	9	
52200	*Cheumatopsyche sp*	3639	+
52430	*Ceratopsyche morosa group*	274	+
52520	*Hydropsyche bidens*	25	
52570	*Hydropsyche simulans*	2	
59970	*Petrophila sp*		+
63900	*Laccophilus sp*		+
66500	*Enochrus sp*		+
67000	*Helophorus sp*		+
67800	*Tropisternus sp*		+
68075	*Psephenus herricki*		+
68700	*Dubiraphia sp*		+
68901	*Macronychus glabratus*	2	
69400	*Stenelmis sp*	26	+
72700	*Anopheles sp*		+
74100	*Simulium sp*	33	
77120	*Ablabesmyia mallochi*		+
77500	*Conchapelopia sp*	11	+
77750	*Hayesomyia senata or Thienemannimyia norena*	38	+
77800	*Helopelopia sp*		+
78140	*Labrundinia pilosella*	15	
78350	*Meropelopia sp*		+
78401	*Natarsia species A (sensu Roback, 1978)*		+
78450	*Nilotanypus fimbriatus*	70	
78655	*Procladius (Holotanypus) sp*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	40	
80370	*Corynoneura lobata*	10	
81825	*Rheocricotopus (Psilocricotopus) robacki*	15	
82141	*Thienemanniella xena*	26	
82820	*Cryptochironomus sp*		+
83840	*Microtendipes pedellus group*		+
84155	*Paralauterborniella nigrohalteralis*		+
84450	*Polypedilum (P.) convictum*	68	
84460	*Polypedilum (P.) fallax group*	8	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*	19	+
84750	*Stictochironomus sp*		+
85265	*Cladotanytarsus vanderwulpi group Type 5*		+
85625	*Rheotanytarsus exiguus group*	83	+
87540	*Hemerodromia sp*	1	
93900	*Elimia sp*	1	+
96900	*Ferrissia sp*		+
97601	*Corbicula fluminea*	1	+

No. Quantitative Taxa:	34	Total Taxa:	70
No. Qualitative Taxa:	54	ICI:	**50**
Number of Organisms:	7017	Qual EPT:	16

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/07/95 River Code: 02-001 River: Scioto River RM: 160.50

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	8	
01801	*Turbellaria*	78	+
03600	*Oligochaeta*		+
05900	*Lirceus sp*		+
06201	*Hyalella azteca*		+
06700	*Crangonyx sp*		+
11020	*Acerpenna pygmaeus*	70	
11120	*Baetis flavistriga*	58	
11130	*Baetis intercalaris*	1719	+
11650	*Procloeon sp (w/ hindwing pads)*		+
12200	*Isonychia sp*	341	+
13000	*Leucrocuta sp*	110	+
13400	*Stenacron sp*	89	+
13521	*Stenonema femoratum*		+
13561	*Stenonema pulchellum*	125	+
16700	*Tricorythodes sp*	54	+
17200	*Caenis sp*		+
18100	*Anthopotamus sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*		+
34700	*Agnetina capitata complex*	5	+
47600	*Sialis sp*		+
48410	*Corydalus cornutus*	1	
50315	*Chimarra obscura*		+
52200	*Cheumatopsyche sp*	817	+
52430	*Ceratopsyche morosa group*	872	+
52540	*Hydropsyche dicantha*		+
52580	*Hydropsyche valanis*	2	
59970	*Petrophila sp*		+
67000	*Helophorus sp*		+
68075	*Psephenus herricki*		+
68702	*Dubiraphia bivittata*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	3	+
69400	*Stenelmis sp*	4	+
74100	*Simulium sp*	83	+
77120	*Ablabesmyia mallochi*		+
77500	*Conchapelopia sp*	16	
77750	*Hayesomyia senata or Thienemannimyia norena*		+
77800	*Helopelopia sp*		+
78140	*Labrundinia pilosella*		+
78450	*Nilotanypus fimbriatus*	144	+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	176	
80370	*Corynoneura lobata*	64	
80410	*Cricotopus (C.) sp*	127	+
80420	*Cricotopus (C.) bicinctus*	64	+
80430	*Cricotopus (C.) tremulus group*	111	
80440	*Cricotopus (C.) trifascia group*		+
81229	*Nanocladius (N.) crassicornus*	32	
82101	*Thienemanniella n.sp 1*	16	
82121	*Thienemanniella n.sp 3*	32	
82130	*Thienemanniella similis*	192	
82141	*Thienemanniella xena*	40	
83840	*Microtendipes pedellus group*		+
84450	*Polypedilum (P.) convictum*	572	+
84460	*Polypedilum (P.) fallax group*	16	
84470	*Polypedilum (P.) illinoense*		+
84475	*Polypedilum (P.) ophioides*		+
84540	*Polypedilum (Tripodura) scalaenum group*		+
84700	*Stenochironomus sp*	32	
85615	*Rheotanytarsus distinctissimus group*	32	
85625	*Rheotanytarsus exiguus group*	286	
87540	*Hemerodromia sp*	9	
96900	*Ferrissia sp*	4	+
97601	*Corbicula fluminea*		+

No. Quantitative Taxa: 37 Total Taxa: 65
No. Qualitative Taxa: 46 ICI: **48**
Number of Organisms: 6404 Qual EPT: 15

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/07/95 River Code: 02-001 River: Scioto River RM: 145.80

Taxa Code	Taxa	Quant/Qual
01320	*Hydra sp*	8
01801	*Turbellaria*	829 +
03600	*Oligochaeta*	16 +
04962	*Mooreobdella fervida*	+
05900	*Lirceus sp*	+
06700	*Crangonyx sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydracarina*	8
11120	*Baetis flavistriga*	66 +
11130	*Baetis intercalaris*	74 +
12200	*Isonychia sp*	181 +
13000	*Leucrocuta sp*	174 +
13400	*Stenacron sp*	198 +
13521	*Stenonema femoratum*	+
13561	*Stenonema pulchellum*	536 +
16324	*Serratella deficiens*	2
16700	*Tricorythodes sp*	10 +
17200	*Caenis sp*	+
21300	*Hetaerina sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
34700	*Agnetina capitata complex*	1 +
47600	*Sialis sp*	+
50315	*Chimarra obscura*	+
52200	*Cheumatopsyche sp*	1019 +
52430	*Ceratopsyche morosa group*	412 +
52540	*Hydropsyche dicantha*	67
53501	*Hydroptilidae*	+
57400	*Neophylax sp*	+
59970	*Petrophila sp*	+
60900	*Peltodytes sp*	+
65800	*Berosus sp*	+
66500	*Enochrus sp*	+
67000	*Helophorus sp*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	18 +
77120	*Ablabesmyia mallochi*	+
77750	*Hayesomyia senata or Thienemannimyia norena*	+
78450	*Nilotanypus fimbriatus*	35
80370	*Corynoneura lobata*	16
81229	*Nanocladius (N.) crassicornus*	35
81240	*Nanocladius (N.) distinctus*	17
82130	*Thienemanniella similis*	157
82820	*Cryptochironomus sp*	+
83040	*Dicrotendipes neomodestus*	+
84450	*Polypedilum (P.) convictum*	605 +
84470	*Polypedilum (P.) illinoense*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
85625	*Rheotanytarsus exiguus group*	207 +
93200	*Hydrobiidae*	+
93900	*Elimia sp*	65 +
95100	*Physella sp*	+
96930	*Laevapex fuscus*	+
97601	*Corbicula fluminea*	2 +

No. Quantitative Taxa: 26 Total Taxa: 54
No. Qualitative Taxa: 45 ICI: **38**
Number of Organisms: 4758 Qual EPT: 15

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/09/95 River Code: 02-166 River: McDonald Creek RM: 9.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
04935	*Erpobdella punctata punctata*	+			
05900	*Lirceus sp*	+			
11200	*Callibaetis sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
52200	*Cheumatopsyche sp*	+			
74100	*Simulium sp*	+			
83300	*Glyptotendipes (G.) sp*	+			
83840	*Microtendipes pedellus group*	+			
84450	*Polypedilum (P.) convictum*	+			
84460	*Polypedilum (P.) fallax group*	+			
93900	*Elimia sp*	+			
95100	*Physella sp*	+			
98200	*Pisidium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 16

No. Qualitative Taxa: 16 ICI:

Number of Organisms: 0 Qual EPT: 5

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 02-166 River: McDonald Creek RM: 6.80

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
04935	*Erpobdella punctata punctata*	+			
05900	*Lirceus sp*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11130	*Baetis intercalaris*	+			
11200	*Callibaetis sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
21200	*Calopteryx sp*	+			
22001	*Coenagrionidae*	+			
23909	*Boyeria vinosa*	+			
52200	*Cheumatopsyche sp*	+			
63900	*Laccophilus sp*	+			
67800	*Tropisternus sp*	+			
68201	*Scirtidae*	+			
68707	*Dubiraphia quadrinotata*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
74100	*Simulium sp*	+			
77500	*Conchapelopia sp*	+			
82820	*Cryptochironomus sp*	+			
84450	*Polypedilum (P.) convictum*	+			
84470	*Polypedilum (P.) illinoense*	+			
84750	*Stictochironomus sp*	+			
85500	*Paratanytarsus sp*	+			
86200	*Tabanus sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 26
No. Qualitative Taxa: 26 ICI:
Number of Organisms: 0 Qual EPT: 5

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/17/95 River Code: 02-166 River: McDonald Creek RM: 2.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
04935	*Erpobdella punctata punctata*	+			
05800	*Caecidotea sp*	+			
05900	*Lirceus sp*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11120	*Baetis flavistriga*	+			
11130	*Baetis intercalaris*	+			
13521	*Stenonema femoratum*	+			
21200	*Calopteryx sp*	+			
52200	*Cheumatopsyche sp*	+			
69225	*Optioservus fastiditus*	+			
69400	*Stenelmis sp*	+			
77500	*Conchapelopia sp*	+			
84450	*Polypedilum (P.) convictum*	+			
84750	*Stictochironomus sp*	+			
85500	*Paratanytarsus sp*	+			
86200	*Tabanus sp*	+			
87540	*Hemerodromia sp*	+			
96900	*Ferrissia sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 19
No. Qualitative Taxa: 19 ICI:
Number of Organisms: 0 Qual EPT: 4

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-172 River: Wildcat Creek RM: 6.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+			
04935	*Erpobdella punctata punctata*	+			
04975	*Mooreobdella poss. tetragon*	+			
05900	*Lirceus sp*	+			
06201	*Hyalella azteca*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11130	*Baetis intercalaris*	+			
13400	*Stenacron sp*	+			
17200	*Caenis sp*	+			
21200	*Calopteryx sp*	+			
22001	*Coenagrionidae*	+			
22300	*Argia sp*	+			
45300	*Sigara sp*	+			
52200	*Cheumatopsyche sp*	+			
52530	*Hydropsyche depravata group*	+			
63900	*Laccophilus sp*	+			
64800	*Uvarus sp*	+			
67000	*Helophorus sp*	+			
68708	*Dubiraphia vittata group*	+			
69200	*Optioservus sp*	+			
69400	*Stenelmis sp*	+			
77355	*Clinotanypus pinguis*	+			
77500	*Conchapelopia sp*	+			
78680	*Procladius (Psilotanypus) bellus*	+			
82710	*Chironomus (C.) sp*	+			
82820	*Cryptochironomus sp*	+			
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84450	*Polypedilum (P.) convictum*	+			
84470	*Polypedilum (P.) illinoense*	+			
84540	*Polypedilum (Tripodura) scalaenum group*	+			
84750	*Stictochironomus sp*	+			
85625	*Rheotanytarsus exiguus group*	+			
86100	*Chrysops sp*	+			
95100	*Physella sp*	+			
98200	*Pisidium sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 37

No. Qualitative Taxa: 37 ICI:

Number of Organisms: 0 Qual EPT: 5

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-172 River: Wildcat Creek RM: 0.50

Taxa Code	Taxa	Quant	Qual
00653	*Eunapius fragilis*		+
01320	*Hydra sp*	23	
01801	*Turbellaria*	1	+
02600	*Nematomorpha*		+
03600	*Oligochaeta*	3	
05900	*Lirceus sp*	2	+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11020	*Acerpenna pygmaeus*		+
11130	*Baetis intercalaris*		+
13000	*Leucrocuta sp*		+
13400	*Stenacron sp*	95	+
13521	*Stenonema femoratum*	2	
13561	*Stenonema pulchellum*	1	
14950	*Leptophlebia sp or Paraleptophebia sp*	1	
17200	*Caenis sp*	1	+
18750	*Hexagenia limbata*		+
21200	*Calopteryx sp*		+
22300	*Argia sp*	21	+
45300	*Sigara sp*		+
47600	*Sialis sp*	1	+
52200	*Cheumatopsyche sp*		+
59100	*Ceraclea sp*		+
64800	*Uvarus sp*		+
66500	*Enochrus sp*		+
67000	*Helophorus sp*		+
68700	*Dubiraphia sp*	1	
68901	*Macronychus glabratus*		+
69400	*Stenelmis sp*		+
77120	*Ablabesmyia mallochi*	5	+
77500	*Conchapelopia sp*		+
77750	*Hayesomyia senata or Thienemannimyia norena*	2	
77800	*Helopelopia sp*		+
78140	*Labrundinia pilosella*	2	
78401	*Natarsia species A (sensu Roback, 1978)*	2	
80370	*Corynoneura lobata*	25	
81229	*Nanocladius (N.) crassicornus*	9	
81270	*Nanocladius (N.) spiniplenus*	7	
82121	*Thienemanniella n.sp 3*	1	
82820	*Cryptochironomus sp*		+
83000	*Dicrotendipes sp*	2	
83300	*Glyptotendipes (G.) sp*	5	
83840	*Microtendipes pedellus group*	51	
84020	*Parachironomus carinatus*	2	
84210	*Paratendipes albimanus or P. duplicatus*	26	+
84450	*Polypedilum (P.) convictum*	2	+
84460	*Polypedilum (P.) fallax group*	26	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*	5	
84750	*Stictochironomus sp*		+
84790	*Tribelos fuscicorne*	7	
84800	*Tribelos jucundum*	2	
85500	*Paratanytarsus sp*	30	
85800	*Tanytarsus sp*	2	
85814	*Tanytarsus glabrescens group*	21	
86100	*Chrysops sp*		+
93900	*Elimia sp*	1	+
96900	*Ferrissia sp*	1	+
98600	*Sphaerium sp*		+
99420	*Amblema plicata plicata*		+
99860	*Lampsilis radiata luteola*		+

No. Quantitative Taxa: 35 Total Taxa: 61
No. Qualitative Taxa: 37 ICI: **36**
Number of Organisms: 388 Qual EPT: 8

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-175 River: Panther Creek RM: 8.90

Taxa Code	Taxa	Quant/Qual
04935	*Erpobdella punctata punctata*	+
05900	*Lirceus sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon irrubrum*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18750	*Hexagenia limbata*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23600	*Aeshna sp*	+
24900	*Gomphus sp*	+
28500	*Libellula sp*	+
43205	*Nepa apiculata*	+
45100	*Palmacorixa sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
51400	*Nyctiophylax sp*	+
60900	*Peltodytes sp*	+
67000	*Helophorus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
77120	*Ablabesmyia mallochi*	+
82730	*Chironomus (C.) decorus group*	+
82820	*Cryptochironomus sp*	+
82880	*Cryptotendipes sp*	+
83040	*Dicrotendipes neomodestus*	+
84315	*Phaenopsectra flavipes*	+
84470	*Polypedilum (P.) illinoense*	+
84750	*Stictochironomus sp*	+
85500	*Paratanytarsus sp*	+
85800	*Tanytarsus sp*	+
85814	*Tanytarsus glabrescens group*	+
86100	*Chrysops sp*	+
95100	*Physella sp*	+
96900	*Ferrissia sp*	+
98200	*Pisidium sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 45
No. Qualitative Taxa: 45 ICI:
Number of Organisms: 0 Qual EPT: 10

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-175 River: Panther Creek RM: 5.70

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
04935	*Erpobdella punctata punctata*	+
05900	*Lirceus sp*	+
06700	*Crangonyx sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11020	*Acerpenna pygmaeus*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13000	*Leucrocuta sp*	+
13521	*Stenonema femoratum*	+
14950	*Leptophlebia sp or Paraleptophebia sp*	+
18750	*Hexagenia limbata*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
23600	*Aeshna sp*	+
27500	*Somatochlora sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
50315	*Chimarra obscura*	+
52200	*Cheumatopsyche sp*	+
52530	*Hydropsyche depravata group*	+
59500	*Oecetis sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	+
80370	*Corynoneura lobata*	+
82820	*Cryptochironomus sp*	+
83840	*Microtendipes pedellus group*	+
84450	*Polypedilum (P.) convictum*	+
84470	*Polypedilum (P.) illinoense*	+
84750	*Stictochironomus sp*	+
85814	*Tanytarsus glabrescens group*	+
86100	*Chrysops sp*	+
95100	*Physella sp*	+
96900	*Ferrissia sp*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 42
No. Qualitative Taxa: 42 ICI:
Number of Organisms: 0 Qual EPT: 12

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-175 River: Panther Creek RM: 1.80

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+			
02600	*Nematomorpha*	+			
05900	*Lirceus sp*	+			
06201	*Hyalella azteca*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11250	*Centroptilum sp (w/o hindwing pads)*	+			
11650	*Procloeon sp (w/ hindwing pads)*	+			
11670	*Procloeon irrubrum*	+			
13000	*Leucrocuta sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
18708	*Hexagenia bilineata*	+			
18750	*Hexagenia limbata*	+			
21200	*Calopteryx sp*	+			
22300	*Argia sp*	+			
27500	*Somatochlora sp*	+			
45300	*Sigara sp*	+			
60900	*Peltodytes sp*	+			
63900	*Laccophilus sp*	+			
68700	*Dubiraphia sp*	+			
72700	*Anopheles sp*	+			
77120	*Ablabesmyia mallochi*	+			
82820	*Cryptochironomus sp*	+			
83840	*Microtendipes pedellus group*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84315	*Phaenopsectra flavipes*	+			
84750	*Stictochironomus sp*	+			
85230	*Cladotanytarsus mancus group*	+			
86100	*Chrysops sp*	+			
95100	*Physella sp*	+			
96900	*Ferrissia sp*	+			
98200	*Pisidium sp*	+			
98600	*Sphaerium sp*	+			
99100	*Pyganodon grandis*	+			
99860	*Lampsilis radiata luteola*	+			

No. Quantitative Taxa: 0 Total Taxa: 35

No. Qualitative Taxa: 35 ICI:

Number of Organisms: 0 Qual EPT: 8

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-181 River: Taylor Creek RM: 4.50

Taxa Code	Taxa	Quant/Qual	
00401	*Spongillidae*		+
01320	*Hydra sp*	4	
01801	*Turbellaria*	8	+
04935	*Erpobdella punctata punctata*		+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*	1	+
11020	*Acerpenna pygmaeus*	50	+
11120	*Baetis flavistriga*		+
11125	*Labiobaetis frondalis*		+
11130	*Baetis intercalaris*		+
11245	*Centroptilum sp*		+
11430	*Diphetor hageni*		+
11650	*Procloeon sp (w/ hindwing pads)*	17	+
11651	*Procloeon sp (w/o hindwing pads)*	36	+
11670	*Procloeon irrubrum*		+
12200	*Isonychia sp*	1	+
13000	*Leucrocuta sp*	2	+
13400	*Stenacron sp*	368	+
13521	*Stenonema femoratum*	150	+
17200	*Caenis sp*	43	+
21200	*Calopteryx sp*	6	+
22001	*Coenagrionidae*		+
22300	*Argia sp*		+
23804	*Basiaeschna janata*		+
23909	*Boyeria vinosa*	1	+
24900	*Gomphus sp*		+
27500	*Somatochlora sp*		+
45300	*Sigara sp*		+
45900	*Notonecta sp*		+
47600	*Sialis sp*		+
50301	*Chimarra aterrima*		+
51400	*Nyctiophylax sp*	15	+
52200	*Cheumatopsyche sp*	7	+
52430	*Ceratopsyche morosa group*		+
52530	*Hydropsyche depravata group*		+
53501	*Hydroptilidae*		+
58505	*Helicopsyche borealis*		+
59400	*Nectopsyche sp*		+
60400	*Gyrinus sp*		+
64050	*Liodessus sp*		+
65800	*Berosus sp*		+
68601	*Ancyronyx variegata*	1	
68700	*Dubiraphia sp*	4	
68707	*Dubiraphia quadrinotata*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	5	+
69225	*Optioservus fastiditus*		+
69400	*Stenelmis sp*	1	+
71900	*Tipula sp*		+
72700	*Anopheles sp*		+
74100	*Simulium sp*		+
74501	*Ceratopogonidae*	8	+
77120	*Ablabesmyia mallochi*	5	+
77355	*Clinotanypus pinguis*		+
77500	*Conchapelopia sp*	15	+
77800	*Helopelopia sp*	25	+
78140	*Labrundinia pilosella*	25	
78450	*Nilotanypus fimbriatus*	15	+
80351	*Corynoneura n.sp 1*	4	
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	8	
80370	*Corynoneura lobata*	118	+
80420	*Cricotopus (C.) bicinctus*	5	
81240	*Nanocladius (N.) distinctus*	5	
81259	*Nanocladius (N.) rectinervis*	30	+
81270	*Nanocladius (N.) spiniplenus*	10	
81530	*Orthocladius (Symposiocladius) lignicola*		+
82101	*Thienemanniella n.sp 1*	8	
82121	*Thienemanniella n.sp 3*	4	
82141	*Thienemanniella xena*		+
82820	*Cryptochironomus sp*		+
82882	*Cryptotendipes sp 2*		+
83840	*Microtendipes pedellus group*	20	
84315	*Phaenopsectra flavipes*	5	
84450	*Polypedilum (P.) convictum*	5	+
84460	*Polypedilum (P.) fallax group*	5	
84470	*Polypedilum (P.) illinoense*		+
84480	*Polypedilum (P.) laetum group*		+
84700	*Stenochironomus sp*		+
85500	*Paratanytarsus sp*	30	
85615	*Rheotanytarsus distinctissimus group*	5	
85625	*Rheotanytarsus exiguus group*	208	+
85720	*Stempellinella n.sp nr. flavidula*	16	+
85800	*Tanytarsus sp*	15	
85802	*Tanytarsus curticornis group*	20	
85814	*Tanytarsus glabrescens group*	127	

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-181 River: Taylor Creek RM: 4.50

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
86100	*Chrysops sp*	+			
87540	*Hemerodromia sp*	16			
95100	*Physella sp*	4 +			
96900	*Ferrissia sp*	16 +			
98200	*Pisidium sp*	1 +			
98600	*Sphaerium sp*	+			
99100	*Pyganodon grandis*	+			

No. Quantitative Taxa: 49 Total Taxa: 92

No. Qualitative Taxa: 72 ICI: **56**

Number of Organisms: 1498 Qual EPT: 22

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/05/95 River Code: 02-181 River: Taylor Creek RM: 2.10

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
07840	*Cambarus (Cambarus) sciotensis*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
50315	*Chimarra obscura*	+
51400	*Nyctiophylax sp*	+
52200	*Cheumatopsyche sp*	+
52530	*Hydropsyche depravata group*	+
60900	*Peltodytes sp*	+
68708	*Dubiraphia vittata group*	+
69200	*Optioservus sp*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
74100	*Simulium sp*	+
77500	*Conchapelopia sp*	+
81825	*Rheocricotopus (Psilocricotopus) robacki*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (P.) convictum*	+
84470	*Polypedilum (P.) illinoense*	+
85625	*Rheotanytarsus exiguus group*	+
85802	*Tanytarsus curticornis group*	+
85814	*Tanytarsus glabrescens group*	+
87540	*Hemerodromia sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 39
No. Qualitative Taxa: 39 ICI:
Number of Organisms: 0 Qual EPT: 12

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/05/95 River Code: 02-181 River: Taylor Creek RM: 2.00

Taxa Code	Taxa	Quant/Qual	
01801	*Turbellaria*		+
05900	*Lirceus sp*		+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*		+
11020	*Acerpenna pygmaeus*	55	+
11120	*Baetis flavistriga*	11	+
11130	*Baetis intercalaris*	100	+
11430	*Diphetor hageni*		+
11650	*Procloeon sp (w/ hindwing pads)*	13	+
11651	*Procloeon sp (w/o hindwing pads)*		+
11670	*Procloeon irrubrum*		+
13000	*Leucrocuta sp*	13	+
13400	*Stenacron sp*	490	+
13521	*Stenonema femoratum*	10	+
17200	*Caenis sp*	4	+
21200	*Calopteryx sp*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*	5	+
23909	*Boyeria vinosa*		+
42700	*Belostoma sp*		+
45300	*Sigara sp*		+
50301	*Chimarra aterrima*		+
51400	*Nyctiophylax sp*		+
52200	*Cheumatopsyche sp*	48	+
60900	*Peltodytes sp*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	7	
69225	*Optioservus fastiditus*		+
69400	*Stenelmis sp*		+
74100	*Simulium sp*		+
77120	*Ablabesmyia mallochi*		+
77500	*Conchapelopia sp*	15	+
77750	*Hayesomyia senata or Thienemannimyia norena*	5	+
77800	*Helopelopia sp*	5	+
78140	*Labrundinia pilosella*	10	
78450	*Nilotanypus fimbriatus*	8	+
80370	*Corynoneura lobata*	158	+
80410	*Cricotopus (C.) sp*		+
80420	*Cricotopus (C.) bicinctus*	10	
81270	*Nanocladius (N.) spiniplenus*	5	
81650	*Parametriocnemus sp*		+
82121	*Thienemanniella n.sp 3*	4	
82141	*Thienemanniella xena*	66	+
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	5	
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	10	+
84210	*Paratendipes albimanus or P. duplicatus*	5	+
84450	*Polypedilum (P.) convictum*	15	+
84460	*Polypedilum (P.) fallax group*	10	+
84470	*Polypedilum (P.) illinoense*		+
84480	*Polypedilum (P.) laetum group*		+
84750	*Stictochironomus sp*		+
85500	*Paratanytarsus sp*	10	
85625	*Rheotanytarsus exiguus group*	245	+
85720	*Stempellinella n.sp nr. flavidula*		+
85800	*Tanytarsus sp*		+
85814	*Tanytarsus glabrescens group*	20	+
85840	*Tanytarsus guerlus group*	10	+
86100	*Chrysops sp*		+
87540	*Hemerodromia sp*	2	+
95100	*Physella sp*		+
96900	*Ferrissia sp*		+
98600	*Sphaerium sp*		+

No. Quantitative Taxa: 31 Total Taxa: 64
No. Qualitative Taxa: 57 ICI: **50**
Number of Organisms: 1374 Qual EPT: 14

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/06/95 River Code: 02-181 River: Taylor Creek RM: 0.70

Taxa Code	Taxa	Quant	Qual
00556	*Ephydatia fluviatilis*		+
01320	*Hydra sp*	82	
01801	*Turbellaria*	12	
02600	*Nematomorpha*		+
03600	*Oligochaeta*	62	+
04686	*Placobdella papillifera*		+
04935	*Erpobdella punctata punctata*		+
07840	*Cambarus (Cambarus) sciotensis*		+
08250	*Orconectes (Procericambarus) rusticus*	1	+
11130	*Baetis intercalaris*		+
11245	*Centroptilum sp*		+
11651	*Procloeon sp (w/o hindwing pads)*	1	+
11670	*Procloeon irrubrum*		+
13400	*Stenacron sp*	857	+
13521	*Stenonema femoratum*	5	+
17200	*Caenis sp*	36	+
21200	*Calopteryx sp*	4	+
22001	*Coenagrionidae*	2	+
22300	*Argia sp*	23	+
23909	*Boyeria vinosa*	1	
28955	*Libellula lydia*		+
45300	*Sigara sp*		+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	2	+
52530	*Hydropsyche depravata group*	8	+
60900	*Peltodytes sp*		+
65800	*Berosus sp*	1	+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	4	
69200	*Optioservus sp*		+
69400	*Stenelmis sp*		+
77120	*Ablabesmyia mallochi*	59	+
77500	*Conchapelopia sp*	8	+
77750	*Hayesomyia senata or Thienemannimyia norena*	18	
77800	*Helopelopia sp*	36	+
78140	*Labrundinia pilosella*	82	
78450	*Nilotanypus fimbriatus*	3	+
78655	*Procladius (Holotanypus) sp*	3	+
80410	*Cricotopus (C.) sp*	3	
81240	*Nanocladius (N.) distinctus*	5	
81250	*Nanocladius (N.) minimus*	15	+
81259	*Nanocladius (N.) rectinervis*	8	
82820	*Cryptochironomus sp*		+
83040	*Dicrotendipes neomodestus*	3	
84460	*Polypedilum (P.) fallax group*	10	
84470	*Polypedilum (P.) illinoense*	8	+
84540	*Polypedilum (Tripodura) scalaenum group*	5	
84700	*Stenochironomus sp*	10	
87540	*Hemerodromia sp*	23	
95100	*Physella sp*	49	+
95501	*Planorbidae*	2	
96900	*Ferrissia sp*	97	+
98200	*Pisidium sp*	2	+

No. Quantitative Taxa: 37 Total Taxa: 53
No. Qualitative Taxa: 38 ICI: **34**
Number of Organisms: 1550 Qual EPT: 10

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/05/95 River Code: 02-182 River: Silver Creek RM: 2.30

Taxa Code	Taxa	Quant/Qual	
01801	*Turbellaria*		+
03360	*Plumatella sp*	1	
03600	*Oligochaeta*	103	
05900	*Lirceus sp*	1	+
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11120	*Baetis flavistriga*		+
11130	*Baetis intercalaris*		+
11430	*Diphetor hageni*		+
11650	*Procloeon sp (w/ hindwing pads)*		+
11651	*Procloeon sp (w/o hindwing pads)*	11	+
11670	*Procloeon irrubrum*	1	+
13000	*Leucrocuta sp*		+
13400	*Stenacron sp*	11	+
13521	*Stenonema femoratum*	48	+
14950	*Leptophlebia sp or Paraleptophebia sp*	37	
17200	*Caenis sp*	1	+
18750	*Hexagenia limbata*		+
21200	*Calopteryx sp*	1	+
22001	*Coenagrionidae*	1	+
22300	*Argia sp*		+
23909	*Boyeria vinosa*		+
43300	*Ranatra sp*		+
45300	*Sigara sp*		+
47600	*Sialis sp*		+
52200	*Cheumatopsyche sp*		+
52430	*Ceratopsyche morosa group*		+
60400	*Gyrinus sp*		+
60900	*Peltodytes sp*		+
63300	*Hydroporus sp*		+
63900	*Laccophilus sp*		+
67200	*Hydrochara sp*		+
67800	*Tropisternus sp*		+
68025	*Ectopria sp*		+
68201	*Scirtidae*	6	
68708	*Dubiraphia vittata group*	1	+
69225	*Optioservus fastiditus*		+
69400	*Stenelmis sp*		+
72340	*Dixella sp*	1	
72700	*Anopheles sp*		+
77120	*Ablabesmyia mallochi*	19	+
77500	*Conchapelopia sp*		+
77750	*Hayesomyia senata or Thienemannimyia norena*	5	
78101	*Labrundinia becki*	5	
78140	*Labrundinia pilosella*	6	
78401	*Natarsia species A (sensu Roback, 1978)*		+
78450	*Nilotanypus fimbriatus*		+
79400	*Zavrelimyia sp*	5	
80370	*Corynoneura lobata*	22	
80420	*Cricotopus (C.) bicinctus*		+
81632	*Parakiefferiella n.sp 2*		+
83040	*Dicrotendipes neomodestus*	85	
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*		+
83840	*Microtendipes pedellus group*	99	+
84210	*Paratendipes albimanus or P. duplicatus*	14	
84315	*Phaenopsectra flavipes*		+
84450	*Polypedilum (P.) convictum*		+
84460	*Polypedilum (P.) fallax group*	14	
84470	*Polypedilum (P.) illinoense*	9	+
84480	*Polypedilum (P.) laetum group*		+
84540	*Polypedilum (Tripodura) scalaenum group*		+
84750	*Stictochironomus sp*		+
85500	*Paratanytarsus sp*	38	
85615	*Rheotanytarsus distinctissimus group*		+
85625	*Rheotanytarsus exiguus group*		+
85800	*Tanytarsus sp*	24	
85802	*Tanytarsus curticornis group*	9	
85814	*Tanytarsus glabrescens group*	14	
86100	*Chrysops sp*		+
95100	*Physella sp*	12	+
96002	*Helisoma anceps anceps*		+
96900	*Ferrissia sp*	13	+
98200	*Pisidium sp*		+
98600	*Sphaerium sp*		+
99100	*Pyganodon grandis*		+
99860	*Lampsilis radiata luteola*		+

No. Quantitative Taxa: 31 Total Taxa: 76
No. Qualitative Taxa: 59 ICI: **28**
Number of Organisms: 617 Qual EPT: 13

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/05/95 River Code: 02-188 River: Cottonwood Ditch RM: 2.50

Taxa Code	Taxa	Quant/Qual	
01801	*Turbellaria*	31	+
02600	*Nematomorpha*		+
02960	*Paragordius sp*	1	
03360	*Plumatella sp*	1	+
03600	*Oligochaeta*	101	+
04664	*Helobdella stagnalis*		+
04666	*Helobdella triserialis*		+
04685	*Placobdella ornata*		+
04935	*Erpobdella punctata punctata*		+
05900	*Lirceus sp*	10	+
06201	*Hyalella azteca*	134	+
08250	*Orconectes (Procericambarus) rusticus*		+
11200	*Callibaetis sp*	4	
13521	*Stenonema femoratum*	1	
17200	*Caenis sp*	27	+
18750	*Hexagenia limbata*		+
22001	*Coenagrionidae*	28	+
22300	*Argia sp*	16	+
28955	*Libellula lydia*		+
42700	*Belostoma sp*		+
45400	*Trichocorixa sp*	2	+
47600	*Sialis sp*		+
52401	*Ceratopsyche sp*	15	+
60300	*Dineutus sp*		+
60400	*Gyrinus sp*		+
60900	*Peltodytes sp*	1	+
63300	*Hydroporus sp*		+
64800	*Uvarus sp*	2	
65800	*Berosus sp*	75	+
67000	*Helophorus sp*	2	
67800	*Tropisternus sp*		+
68130	*Helichus sp*	2	
68702	*Dubiraphia bivittata*	281	+
68708	*Dubiraphia vittata group*	80	+
68901	*Macronychus glabratus*	22	+
69400	*Stenelmis sp*	40	
74501	*Ceratopogonidae*	28	+
77500	*Conchapelopia sp*	4	
77750	*Hayesomyia senata or Thienemannimyia norena*	3	
77800	*Helopelopia sp*	2	
78655	*Procladius (Holotanypus) sp*	1	
79020	*Tanypus neopunctipennis*		+
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*	3	
81250	*Nanocladius (N.) minimus*	3	
81632	*Parakiefferiella n.sp 2*	1	
82820	*Cryptochironomus sp*	1	+
83300	*Glyptotendipes (G.) sp*	1	
84210	*Paratendipes albimanus or P. duplicatus*	2	
84470	*Polypedilum (P.) illinoense*	3	+
84960	*Pseudochironomus sp*		+
85230	*Cladotanytarsus mancus group*	3	
85500	*Paratanytarsus sp*	4	
85625	*Rheotanytarsus exiguus group*	1	
85720	*Stempellinella n.sp nr. flavidula*	1	
85814	*Tanytarsus glabrescens group*	3	
95100	*Physella sp*	2	+
96264	*Planorbella (Pierosoma) pilsbryi*	8	+
98600	*Sphaerium sp*		+
99100	*Pyganodon grandis*		+
99550	*Uniomerus tetralasmus*		+

No. Quantitative Taxa: 41 Total Taxa: 60
No. Qualitative Taxa: 39 ICI: **28**
Number of Organisms: 950 Qual EPT: 3

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/05/95 River Code: 02-188 River: Cottonwood Ditch RM: 0.70

Taxa Code	Taxa	Quant/Qual	
01801	*Turbellaria*	1349	+
01900	*Nemertea*	16	
03600	*Oligochaeta*	471	+
04935	*Erpobdella punctata punctata*	1	+
05900	*Lirceus sp*	17	
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
11200	*Callibaetis sp*		+
13400	*Stenacron sp*		+
17200	*Caenis sp*	1	
21200	*Calopteryx sp*		+
21300	*Hetaerina sp*	1	
22001	*Coenagrionidae*	2	+
22300	*Argia sp*	16	+
23909	*Boyeria vinosa*		+
27307	*Epitheca (Epicordulia) princeps*		+
45400	*Trichocorixa sp*		+
52200	*Cheumatopsyche sp*	26	+
52530	*Hydropsyche depravata group*	2	+
53800	*Hydroptila sp*		+
59570	*Oecetis nocturna*	1	
60900	*Peltodytes sp*		+
65800	*Berosus sp*	69	+
67000	*Helophorus sp*		+
68130	*Helichus sp*		+
68702	*Dubiraphia bivittata*	28	+
68708	*Dubiraphia vittata group*	28	+
69400	*Stenelmis sp*	233	+
74100	*Simulium sp*		+
74501	*Ceratopogonidae*	24	
77355	*Clinotanypus pinguis*		+
77500	*Conchapelopia sp*	231	+
77740	*Hayesomyia senata*	23	+
77800	*Helopelopia sp*	23	
79020	*Tanypus neopunctipennis*		+
80420	*Cricotopus (C.) bicinctus*	347	+
81231	*Nanocladius (N.) crassicornus or N. (N.) rectinervus*		+
81250	*Nanocladius (N.) minimus*	185	+
82141	*Thienemanniella xena*	32	+
82820	*Cryptochironomus sp*	23	+
82880	*Cryptotendipes sp*	23	
83040	*Dicrotendipes neomodestus*	116	+
83158	*Endochironomus nigricans*	23	
83300	*Glyptotendipes (G.) sp*		+
84020	*Parachironomus carinatus*	23	
84030	*Parachironomus directus*	23	
84450	*Polypedilum (P.) convictum*	208	+
84470	*Polypedilum (P.) illinoense*	185	+
84520	*Polypedilum (Tripodura) halterale group*		+
84540	*Polypedilum (Tripodura) scalaenum group*	254	+
85500	*Paratanytarsus sp*	23	
85625	*Rheotanytarsus exiguus group*	139	+
85800	*Tanytarsus sp*	23	
85814	*Tanytarsus glabrescens group*	23	
87540	*Hemerodromia sp*	77	+
95100	*Physella sp*		+
96900	*Ferrissia sp*		+
98200	*Pisidium sp*		+
98600	*Sphaerium sp*	4	+

No. Quantitative Taxa: 38 Total Taxa: 59
No. Qualitative Taxa: 45 ICI: **28**
Number of Organisms: 4293 Qual EPT: 5

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 05-033 River: Little Sandusky River RM: 3.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
08250	*Orconectes (Procericambarus) rusticus*	+			
13400	*Stenacron sp*	+			
17200	*Caenis sp*	+			
21200	*Calopteryx sp*	+			
22300	*Argia sp*	+			
52200	*Cheumatopsyche sp*	+			
68901	*Macronychus glabratus*	+			
69400	*Stenelmis sp*	+			
77500	*Conchapelopia sp*	+			
84750	*Stictochironomus sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 11

No. Qualitative Taxa: 11 ICI:

Number of Organisms: 0 Qual EPT: 3

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/17/95 River Code: 05-070 River: Trib. to Little Sandusky River (RM RM: 0.90

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
02600	*Nematomorpha*	+			
04687	*Placobdella parasitica*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
22001	*Coenagrionidae*	+			
45400	*Trichocorixa sp*	+			
65800	*Berosus sp*	+			
68708	*Dubiraphia vittata group*	+			
77355	*Clinotanypus pinguis*	+			
77800	*Helopelopia sp*	+			
85500	*Paratanytarsus sp*	+			
95100	*Physella sp*	+			
96264	*Planorbella (Pierosoma) pilsbryi*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 13
No. Qualitative Taxa: 13 ICI:
Number of Organisms: 0 Qual EPT: 0

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/17/95 River Code: 05-300 River: Tymochtee Creek RM: 51.60

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
04935	*Erpobdella punctata punctata*	+			
05800	*Caecidotea sp*	+			
06700	*Crangonyx sp*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11200	*Callibaetis sp*	+			
13400	*Stenacron sp*	+			
21200	*Calopteryx sp*	+			
52200	*Cheumatopsyche sp*	+			
60900	*Peltodytes sp*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
74100	*Simulium sp*	+			
77355	*Clinotanypus pinguis*	+			
77500	*Conchapelopia sp*	+			
84450	*Polypedilum (P.) convictum*	+			
93900	*Elimia sp*	+			
95100	*Physella sp*	+			
96264	*Planorbella (Pierosoma) pilsbryi*	+			
98200	*Pisidium sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 21

No. Qualitative Taxa: 21 ICI:

Number of Organisms: 0 Qual EPT: 3

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/17/95 River Code: 05-300 River: Tymochtee Creek RM: 47.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
05800	*Caecidotea sp*	+			
06201	*Hyalella azteca*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11120	*Baetis flavistriga*	+			
11200	*Callibaetis sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
13570	*Stenonema terminatum*	+			
17200	*Caenis sp*	+			
21200	*Calopteryx sp*	+			
22001	*Coenagrionidae*	+			
23909	*Boyeria vinosa*	+			
52200	*Cheumatopsyche sp*	+			
59700	*Triaenodes sp*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
74100	*Simulium sp*	+			
77500	*Conchapelopia sp*	+			
84470	*Polypedilum (P.) illinoense*	+			
84700	*Stenochironomus sp*	+			
84750	*Stictochironomus sp*	+			
85625	*Rheotanytarsus exiguus group*	+			
87540	*Hemerodromia sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 23

No. Qualitative Taxa: 23 ICI:

Number of Organisms: 0 Qual EPT: 8

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 05-300 River: Tymochtee Creek RM: 42.80

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
05800	*Caecidotea sp*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11120	*Baetis flavistriga*	+			
11200	*Callibaetis sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
47600	*Sialis sp*	+			
52200	*Cheumatopsyche sp*	+			
68901	*Macronychus glabratus*	+			
69400	*Stenelmis sp*	+			
77800	*Helopelopia sp*	+			
83840	*Microtendipes pedellus group*	+			
84450	*Polypedilum (P.) convictum*	+			
84460	*Polypedilum (P.) fallax group*	+			
84750	*Stictochironomus sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 16

No. Qualitative Taxa: 16 ICI:

Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 05-300 River: Tymochtee Creek RM: 38.90

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+			
03600	*Oligochaeta*	+			
06201	*Hyalella azteca*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11120	*Baetis flavistriga*	+			
11130	*Baetis intercalaris*	+			
12200	*Isonychia sp*	+			
13400	*Stenacron sp*	+			
17200	*Caenis sp*	+			
21200	*Calopteryx sp*	+			
23909	*Boyeria vinosa*	+			
47600	*Sialis sp*	+			
51600	*Polycentropus sp*	+			
52200	*Cheumatopsyche sp*	+			
63900	*Laccophilus sp*	+			
68075	*Psephenus herricki*	+			
68708	*Dubiraphia vittata group*	+			
68901	*Macronychus glabratus*	+			
69400	*Stenelmis sp*	+			
77500	*Conchapelopia sp*	+			
84470	*Polypedilum (P.) illinoense*	+			
84750	*Stictochironomus sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 23

No. Qualitative Taxa: 23 ICI:

Number of Organisms: 0 Qual EPT: 7

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 05-319 River: Pawpaw Run RM: 4.00

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
05800	*Caecidotea sp*	+
06201	*Hyalella azteca*	+
08220	*Orconectes (Gremicambarus) immunis*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11018	*Acerpenna macdunnoughi*	+
11200	*Callibaetis sp*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
27500	*Somatochlora sp*	+
42700	*Belostoma sp*	+
47600	*Sialis sp*	+
52200	*Cheumatopsyche sp*	+
59410	*Nectopsyche diarina*	+
60900	*Peltodytes sp*	+
63300	*Hydroporus sp*	+
63900	*Laccophilus sp*	+
65800	*Berosus sp*	+
67800	*Tropisternus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
72340	*Dixella sp*	+
77500	*Conchapelopia sp*	+
78400	*Natarsia sp*	+
79030	*Tanypus punctipennis*	+
82820	*Cryptochironomus sp*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (P.) convictum*	+
84470	*Polypedilum (P.) illinoense*	+
84800	*Tribelos jucundum*	+
86100	*Chrysops sp*	+
86200	*Tabanus sp*	+
95100	*Physella sp*	+
96264	*Planorbella (Pierosoma) pilsbryi*	+
98200	*Pisidium sp*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 39
No. Qualitative Taxa: 39 ICI:
Number of Organisms: 0 Qual EPT: 5

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 05-319 River: Pawpaw Run RM: 0.60

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
08250	*Orconectes (Procericambarus) rusticus*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
23618	*Aeshna umbrosa*	+			
45300	*Sigara sp*	+			
63900	*Laccophilus sp*	+			
68201	*Scirtidae*	+			
68708	*Dubiraphia vittata group*	+			
83040	*Dicrotendipes neomodestus*	+			
84460	*Polypedilum (P.) fallax group*	+			
84750	*Stictochironomus sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 13

No. Qualitative Taxa: 13 ICI:

Number of Organisms: 0 Qual EPT: 3

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/17/95 River Code: 05-321 River: Enoch Creek RM: 1.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
05800	*Caecidotea sp*	+			
08220	*Orconectes (Gremicambarus) immunis*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11120	*Baetis flavistriga*	+			
11200	*Callibaetis sp*	+			
13521	*Stenonema femoratum*	+			
21200	*Calopteryx sp*	+			
27500	*Somatochlora sp*	+			
45300	*Sigara sp*	+			
52200	*Cheumatopsyche sp*	+			
60400	*Gyrinus sp*	+			
63900	*Laccophilus sp*	+			
66500	*Enochrus sp*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
72340	*Dixella sp*	+			
72700	*Anopheles sp*	+			
77500	*Conchapelopia sp*	+			
84450	*Polypedilum (P.) convictum*	+			
84470	*Polypedilum (P.) illinoense*	+			
84750	*Stictochironomus sp*	+			
85500	*Paratanytarsus sp*	+			
95100	*Physella sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 24
No. Qualitative Taxa: 24 ICI:
Number of Organisms: 0 Qual EPT: 4

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/14/95 River Code: 05-322 River: Prairie Run RM: 6.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
04685	*Placobdella ornata*	+			
06700	*Crangonyx sp*	+			
08220	*Orconectes (Gremicambarus) immunis*	+			
11200	*Callibaetis sp*	+			
22001	*Coenagrionidae*	+			
45400	*Trichocorixa sp*	+			
61400	*Agabus sp*	+			
67800	*Tropisternus sp*	+			
78650	*Procladius sp*	+			
82820	*Cryptochironomus sp*	+			
83150	*Endochironomus sp*	+			
84470	*Polypedilum (P.) illinoense*	+			
95100	*Physella sp*	+			
96264	*Planorbella (Pierosoma) pilsbryi*	+			

No. Quantitative Taxa: 0 Total Taxa: 15

No. Qualitative Taxa: 15 ICI:

Number of Organisms: 0 Qual EPT: 1

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/17/95 River Code: 05-322 River: Prairie Run RM: 1.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
04935	*Erpobdella punctata punctata*	+			
06700	*Crangonyx sp*	+			
11200	*Callibaetis sp*	+			
13400	*Stenacron sp*	+			
23618	*Aeshna umbrosa*	+			
23909	*Boyeria vinosa*	+			
27500	*Somatochlora sp*	+			
45300	*Sigara sp*	+			
52200	*Cheumatopsyche sp*	+			
63900	*Laccophilus sp*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
82820	*Cryptochironomus sp*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84700	*Stenochironomus sp*	+			
84800	*Tribelos jucundum*	+			
95100	*Physella sp*	+			
96264	*Planorbella (Pierosoma) pilsbryi*	+			

No. Quantitative Taxa: 0 Total Taxa: 18

No. Qualitative Taxa: 18 ICI:

Number of Organisms: 0 Qual EPT: 3

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/09/95 River Code: 05-324 River: Blood Run RM: 1.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
04935	*Erpobdella punctata punctata*	+			
05800	*Caecidotea sp*	+			
06700	*Crangonyx sp*	+			
08310	*Procambarus (Ortmannicus) acutus acutus*	+			
11125	*Labiobaetis frondalis*	+			
11130	*Baetis intercalaris*	+			
11250	*Centroptilum sp (w/o hindwing pads)*	+			
13400	*Stenacron sp*	+			
22001	*Coenagrionidae*	+			
23909	*Boyeria vinosa*	+			
45300	*Sigara sp*	+			
47600	*Sialis sp*	+			
52200	*Cheumatopsyche sp*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
74100	*Simulium sp*	+			
77500	*Conchapelopia sp*	+			
82820	*Cryptochironomus sp*	+			
83840	*Microtendipes pedellus group*	+			
84470	*Polypedilum (P.) illinoense*	+			
84750	*Stictochironomus sp*	+			
86200	*Tabanus sp*	+			
93900	*Elimia sp*	+			
95100	*Physella sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 26
No. Qualitative Taxa: 26 ICI:
Number of Organisms: 0 Qual EPT: 5

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of				Percent of Individuals							Rel.No. minus tolerants /(1.0 km)			
River Mile	Type	Date	Drainage area (sq mi)	Total species	Sunfish species	Sucker species	Intolerant species	Rnd-bodied suckers	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies			IBI	Modified Iwb
Scioto River - (02-001)																		
Year: 95																		
203.30	A	07/06/95	223	20(3)	5(5)	4(3)	0(1)	32(3)	42(3)	25(3)	23(3)	4(1)	73(5)	1.0(3)	462(5)		38	8.8
203.30	A	08/23/95	223	24(5)	5(5)	5(3)	0(1)	34(3)	50(5)	32(1)	33(1)	10(5)	56(5)	0.0(5)	802(5)		44	9.7
203.30	A	09/28/95	223	28(5)	4(5)	6(5)	1(1)	39(5)	52(5)	26(3)	26(3)	7(3)	66(5)	0.3(5)	1312(5)		50	10.6
192.20	A	07/06/95	261	19(3)	4(5)	5(3)	0(1)	18(1)	21(1)	38(1)	25(3)	10(5)	62(5)	1.9(3)	256(3)		34	8.3
192.20	A	08/22/95	261	20(3)	4(5)	6(5)	1(1)	31(3)	35(3)	35(1)	26(3)	6(3)	68(5)	0.3(5)	460(5)		42	8.9
192.20	A	09/29/95	261	22(5)	6(5)	5(3)	0(1)	24(3)	31(3)	45(1)	34(1)	8(3)	54(3)	0.4(5)	512(5)		38	9.5
178.50	A	07/10/95	408	20(3)	4(5)	5(3)	0(1)	10(1)	15(1)	45(1)	31(1)	18(5)	50(3)	0.0(5)	238(3)		32	8.1
178.50	A	08/22/95	408	24(5)	5(5)	6(5)	1(1)	20(3)	27(3)	36(1)	19(3)	16(5)	64(5)	0.0(5)	312(3)		44	9.0
175.70	A	07/10/95	526	10(3)	4(5)	3(3)	0(1)	2(1)	5(1)	74(1)	43(1)	7(3)	49(3)	3.3(1)	32(1)	*	24	4.2
175.70	A	08/22/95	526	18(3)	6(5)	5(3)	0(1)	8(1)	9(1)	65(1)	43(1)	5(3)	51(3)	0.0(5)	84(1)		28	5.8
175.70	A	09/29/95	526	15(3)	6(5)	4(3)	0(1)	5(1)	10(1)	61(1)	33(1)	10(3)	55(5)	1.5(3)	102(1)		28	6.2
169.40	A	07/21/95	564	23(5)	6(5)	5(3)	0(1)	11(1)	25(1)	41(1)	33(1)	23(5)	44(3)	0.0(5)	210(3)		34	8.4
169.40	A	08/22/95	564	19(3)	5(5)	4(3)	1(1)	26(3)	44(3)	29(1)	32(1)	16(5)	52(3)	0.6(5)	246(3)		36	8.8
169.40	A	09/29/95	564	28(5)	6(5)	6(5)	2(3)	16(1)	35(3)	13(5)	41(1)	18(5)	40(3)	0.2(5)	848(5)		46	10.5
160.50	A	07/21/95	755	17(3)	5(5)	4(3)	1(1)	43(5)	49(5)	17(3)	17(3)	28(5)	51(3)	0.6(3)	306(3)		42	9.1
160.50	A	08/21/95	755	18(3)	3(3)	3(3)	3(3)	36(3)	44(3)	7(5)	9(5)	39(5)	48(3)	0.6(3)	508(5)		44	9.6
160.50	A	10/02/95	755	19(3)	3(3)	4(3)	3(3)	24(3)	29(3)	6(5)	40(1)	28(5)	31(3)	0.0(5)	748(5)		42	9.2
145.70	A	07/21/95	990	16(3)	3(3)	2(1)	1(1)	20(3)	32(3)	12(5)	20(3)	26(5)	52(3)	0.4(5)	400(3)		38	8.7
145.70	A	08/21/95	990	14(3)	3(3)	3(3)	1(1)	28(3)	40(3)	7(5)	11(5)	29(5)	55(5)	1.0(3)	372(3)		42	8.8
145.70	A	10/02/95	990	18(3)	3(3)	2(1)	3(3)	18(1)	34(3)	3(5)	7(5)	15(5)	73(5)	0.2(5)	1423(5)		44	9.9

▲ - IBI is low end adjusted.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Number of: Sunfish species	Number of: Sucker species	Number of: Intolerant species	Number of: Darter species	Percent of Individuals: Simple Lithophils	Percent of Individuals: Tolerant fishes	Percent of Individuals: Omni-vores	Percent of Individuals: Top carnivores	Percent of Individuals: Insect-ivores	Percent of Individuals: DELT anomalies	Rel.No. minus tolerants /(0.3km)		IBI	Modified Iwb
Scioto River - (02001)																		
Year: 95																		
233.60	D	07/10/95	25	15(3)	0(1)	1(1)	0(1)	4(5)	24(3)	59(1)	14(5)	0.0(1)	37(3)	0.4(3)	147(1)		28	6.2
233.60	E	08/17/95	25	25(5)	3(3)	2(3)	1(1)	7(5)	25(3)	45(3)	10(5)	0.8(1)	30(3)	0.2(5)	690(3)		40	8.5
231.70	D	07/11/95	30	21(5)	2(3)	2(3)	1(1)	7(5)	32(3)	60(1)	18(5)	0.0(1)	36(3)	0.0(5)	450(3)		38	7.4
231.70	E	08/17/95	30	20(5)	2(3)	2(3)	0(1)	6(5)	35(3)	50(1)	22(3)	0.2(1)	35(3)	0.0(5)	414(3)		36	7.1
226.30	D	07/11/95	47	24(5)	3(3)	2(3)	2(1)	6(5)	28(3)	37(3)	22(3)	0.6(1)	62(5)	0.3(3)	332(3)		38	7.8
226.30	D	08/24/95	47	26(5)	4(5)	2(3)	1(1)	6(5)	14(1)	51(1)	39(1)	1.1(3)	48(3)	0.0(5)	486(3)		36	8.3
221.90	D	07/05/95	76	22(5)	2(3)	3(3)	1(1)	4(3)	22(3)	44(1)	27(3)	3.8(3)	66(5)	3.2(1)	111(1)	*	32	7.6
221.90	D	08/24/95	76	25(5)	5(5)	5(5)	0(1)	3(3)	42(5)	61(1)	44(1)	2.5(3)	51(3)	0.0(5)	168(1)		38	7.8
220.80	D	07/11/95	96	16(3)	2(3)	2(3)	0(1)	3(3)	31(3)	67(1)	48(1)	2.0(3)	50(3)	0.0(5)	77(1)		30	5.7
220.80	D	08/24/95	96	21(3)	2(3)	4(5)	0(1)	3(3)	33(3)	53(1)	31(3)	2.7(3)	65(5)	0.0(5)	131(1)		36	7.5
216.20	D	07/12/95	117	26(5)	4(5)	4(3)	2(1)	7(5)	30(3)	24(3)	19(3)	1.5(3)	77(5)	0.0(5)	617(3)		44	8.7
216.20	D	08/17/95	117	28(5)	4(5)	5(5)	2(1)	7(5)	38(5)	31(3)	29(3)	2.0(3)	65(5)	0.7(3)	308(3)		46	8.6
213.90	D	07/12/95	129	18(3)	4(5)	2(1)	0(1)	5(3)	29(3)	34(3)	15(5)	6.4(5)	78(5)	0.0(5)	140(1)		40	7.1
213.90	D	08/17/95	129	28(5)	4(5)	5(5)	2(1)	7(5)	36(3)	25(3)	18(5)	5.2(5)	74(5)	1.0(3)	196(1)		46	8.2
212.80	D	07/12/95	160	24(5)	4(5)	4(3)	0(1)	6(5)	9(1)	42(1)	16(5)	6.2(5)	76(5)	0.3(3)	296(3)		42	8.2
212.80	D	08/24/95	160	25(5)	6(5)	6(5)	0(1)	4(3)	28(3)	44(1)	18(5)	10.7(5)	70(5)	0.4(3)	221(3)		44	8.4
211.50	D	07/10/95	165	22(3)	4(5)	4(3)	0(1)	3(3)	24(3)	43(1)	28(3)	9.0(5)	55(3)	0.5(5)	171(1)		36	6.7
211.50	D	09/28/95	165	28(5)	6(5)	5(5)	0(1)	4(3)	26(3)	26(3)	25(3)	5.9(5)	68(5)	1.1(3)	677(3)		44	9.3
211.30	D	07/12/95	165	20(3)	4(5)	3(3)	1(1)	6(5)	53(5)	45(1)	41(1)	3.7(3)	54(3)	0.0(5)	450(3)		38	8.7
211.30	D	08/23/95	165	18(3)	4(5)	3(3)	0(1)	5(3)	64(5)	21(3)	20(3)	4.2(3)	75(5)	0.0(5)	1026(5)		44	9.6
211.20	D	07/12/95	165	24(5)	4(5)	4(3)	0(1)	5(3)	31(3)	36(1)	27(3)	8.6(5)	63(5)	0.4(5)	233(3)		42	7.2

na - Qualitative data, Modified Iwb not applicable.
▲ - IBI is low-end adjusted.
● - One or more species excluded from IBI calculation.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of					Percent of Individuals								
River Mile	Type	Date	Drainage area (sq mi)	Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
211.20	D	08/23/95	165	24(5)	5(5)	4(3)	1(1)	5(3)	27(3)	36(3)	21(3)	11.1(5)	66(5)	0.0(5)	341(3)	44	8.0
210.10	D	07/07/95	169	25(5)	4(5)	5(5)	1(1)	5(3)	35(3)	42(1)	39(1)	1.7(3)	55(5)	0.0(5)	398(3)	40	8.7
210.10	D	08/23/95	169	27(5)	5(5)	4(3)	1(1)	6(5)	29(3)	34(3)	32(3)	1.6(3)	59(5)	0.0(5)	1052(5)	46	9.5
207.30	D	07/06/95	178	22(3)	4(5)	5(5)	2(1)	5(3)	25(3)	39(1)	37(1)	8.2(5)	55(3)	1.0(3)	279(3)	36	8.4
207.30	D	08/16/95	178	22(3)	4(5)	3(3)	1(1)	6(5)	43(5)	28(3)	21(3)	12.2(5)	67(5)	3.3(1)	105(1) *	40	7.9
178.50	D	10/03/95	408	32(5)	6(5)	6(5)	2(1)	6(3)	20(3)	56(1)	45(1)	7.4(5)	46(3)	0.0(5)	468(3)	40	9.1
Wildcat Creek - (02172)																	
Year: 95																	
0.60	D	07/07/95	22	19(5)	3(3)	3(5)	0(1)	6(5)	33(3)	61(1)	40(1)	1.1(3)	40(3)	0.0(5)	276(3)	38	7.3
0.60	D	08/16/95	22	24(5)	3(3)	4(5)	0(1)	7(5)	47(5)	55(1)	41(1)	1.0(1)	45(3)	0.3(5)	298(3)	38	8.2
Panther Creek - (02175)																	
Year: 95																	
1.90	D	07/06/95	22	20(5)	3(3)	2(3)	1(1)	8(5)	47(5)	33(3)	26(3)	2.6(3)	59(5)	0.0(5)	351(3)	44	8.2
1.90	D	08/15/95	22	21(5)	3(3)	2(3)	1(1)	7(5)	59(5)	47(3)	34(1)	2.3(3)	44(3)	0.0(5)	242(3)	40	6.5

na - Qualitative data, Modified Iwb not applicable.
▲ - IBI is low-end adjusted.
● - One or more species excluded from IBI calculation.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of						Percent of Individuals						
River Mile	Type	Date	Drainage area (sq mi)	Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
McDonald Creek - (02-166)																
Year: 95																
9.10	E	07/31/95	2.7	7(3)	3(3)	0(1)	1(1)	2(3)	1(1)	97(1)	93(1)	98(1)	2(1)	0.0(5)	30(1)	22
9.10	D	10/10/95	2.7	6(3)	3(3)	0(1)	1(1)	2(3)	1(1)	94(1)	92(1)	99(1)	5(1)	0.0(5)	9(1)*	22
6.80	D	07/31/95	5.8	10(3)	4(3)	0(1)	1(1)	2(3)	2(1)	91(1)	78(1)	96(1)	8(1)	0.0(5)	159(3)	24
6.80	D	10/10/95	5.8	11(3)	6(5)	0(1)	1(1)	2(3)	2(1)	94(1)	69(1)	96(1)	8(1)	0.1(3)	106(1)	22
2.70	D	08/18/95	12.7	15(3)	6(3)	0(1)	3(3)	4(3)	5(3)	76(1)	58(1)	84(1)	30(3)	0.0(5)	176(1)	28
2.70	D	10/10/95	12.7	13(3)	5(3)	0(1)	1(1)	3(3)	3(1)	73(1)	41(1)	80(1)	43(3)	0.5(3)	168(1)	22
Wildcat Creek - (02-172)																
Year: 95																
6.80	E	07/07/95	5.8	18(5)	6(5)	0(1)	1(1)	3(3)	5(3)	70(1)	22(3)	70(1)	25(3)	0.0(5)	488(3)	34
6.80	E	08/16/95	5.8	19(5)	6(5)	0(1)	2(1)	3(3)	6(5)	57(3)	18(3)	50(3)	31(3)	0.0(5)	312(3)	40
Panther Creek - (02-175)																
Year: 95																
9.00	D	07/13/95	7.9	14(5)	6(5)	1(1)	1(1)	5(5)	5(3)	51(3)	26(3)	42(3)	15(1)	0.0(5)	1290(5)	40
9.00	E	08/16/95	7.9	13(3)	7(5)	1(1)	0(1)	3(3)	3(3)	56(3)	19(3)	53(3)	15(1)	0.0(5)	374(3)	34
5.70	D	07/07/95	16.1	14(3)	6(3)	1(1)	1(1)	5(5)	5(3)	62(1)	20(3)	76(1)	34(3)	0.0(5)	194(1)	30
5.70	D	08/15/95	16.1	9(3)	4(3)	1(1)	0(1)	3(3)	3(1)	69(1)	20(3)	73(1)	25(3)	0.0(5)	98(1)	26
Taylor Creek - (02-181)																
Year: 95																
4.50	D	07/12/95	12.0	20(5)	6(3)	1(1)	5(3)	7(5)	8(5)	51(3)	17(5)	53(3)	41(3)	0.0(5)	957(5)	46
4.50	D	08/25/95	12.0	20(5)	6(3)	1(1)	4(3)	6(5)	7(5)	63(1)	22(3)	61(1)	15(1)	0.0(5)	1493(5)	38
2.10	D	07/13/95	15.3	16(5)	5(3)	1(1)	6(5)	7(5)	8(5)	47(3)	18(3)	46(3)	35(3)	0.0(5)	1278(5)	46

▲ - IBI is low end adjusted.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of						Percent of Individuals						
River Mile	Type	Date	Drainage area (sq mi)	Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
2.10	D	08/24/95	15.3	16(5)	6(3)	1(1)	6(5)	6(5)	7(5)	61(1)	17(5)	64(1)	18(1)	0.0(5)	1176(5)	42
2.00	D	07/13/95	15.3	20(5)	6(3)	1(1)	5(3)	7(5)	8(5)	45(3)	22(3)	47(3)	33(3)	0.0(5)	525(3)	42
2.00	D	08/24/95	15.3	18(5)	6(3)	1(1)	5(3)	6(5)	6(3)	60(1)	17(5)	70(1)	20(1)	0.0(5)	405(3)	36
0.80	D	07/14/95	16.3	22(5)	6(3)	0(1)	5(3)	5(5)	7(5)	47(3)	40(1)	16(5)	24(3)	0.0(5)	771(5)	44
0.80	D	08/24/95	16.3	24(5)	7(5)	0(1)	5(3)	3(3)	6(3)	50(3)	48(1)	21(5)	40(3)	0.2(3)	320(3)	38
Silver Creek - (02-182)																
Year: 95																
2.40	D	07/12/95	13.6	21(5)	8(5)	1(1)	4(3)	7(5)	7(5)	56(1)	48(1)	55(3)	22(1)	0.0(5)	633(3)	38
2.40	D	09/28/95	13.6	24(5)	8(5)	1(1)	4(3)	6(5)	6(3)	54(3)	38(1)	53(3)	51(5)	0.1(3)	674(3)	40
Cottonwood Ditch - (02-188)																
Year: 95																
2.40	D	07/05/95	18.1	18(5)	5(3)	0(1)	2(1)	2(1)	4(3)	73(1)	43(1)	50(3)	52(5)	0.5(3)	245(3)	30
2.40	E	08/15/95	18.1	12(3)	4(3)	0(1)	1(1)	0(1)	2(1)	51(3)	8(5)	46(3)	82(5)	0.0(5)	128(1)	32
0.80	D	07/05/95	19.8	22(5)	7(5)	0(1)	3(1)	3(3)	5(3)	85(1)	47(1)	47(3)	51(5)	0.3(3)	183(1)	32
0.80	E	08/15/95	19.8	16(3)	6(3)	0(1)	5(3)	4(3)	7(3)	71(1)	25(3)	67(1)	63(5)	1.0(3)	108(1)	30

▲ - IBI is low end adjusted.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of						Percent of Individuals						
River Mile	Type	Date	Drainage area (sq mi)	Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
Little Sandusky R. - (05-033)																
Year: 95																
10.40	D	08/01/95	5.3	8(3)	5(3)	0(1)	0(1)	0(1)	1(1)	92(1)	85(1)	88(1)	4(1)	0.9(3)	135(3)	20
Tymochtee Creek - (05-300)																
Year: 95																
51.60	E	08/01/95	6.1	9(3)	4(3)	0(1)	0(1)	1(1)	1(1)	77(1)	31(1)	71(1)	7(1)	0.0(5)	70(1)	20
51.60	E	10/10/95	6.1	8(3)	5(3)	0(1)	0(1)	0(1)	2(1)	81(1)	47(1)	77(1)	2(1)	0.0(5)	332(3)	22
Pawpaw Creek - (05-319)																
Year: 95																
4.00	E	07/31/95	15.0	12(3)	5(3)	0(1)	1(1)	1(1)	1(1)	68(1)	16(5)	60(1)	21(1)	0.8(3)	234(3)	24
4.00	E	10/11/95	15.0	12(3)	4(3)	0(1)	1(1)	1(1)	1(1)	85(1)	71(1)	87(1)	16(1)	0.0(5)	118(1)	20
0.60	E	08/04/95	17.4	16(3)	5(3)	1(1)	1(1)	3(3)	3(1)	72(1)	34(1)	39(3)	21(1)	0.0(5)	242(3)	26
0.60	E	10/12/95	17.4	19(5)	6(3)	1(1)	2(1)	3(3)	3(1)	70(1)	28(3)	59(1)	41(3)	0.3(3)	178(1)	26
Carroll Ditch - (05-320)																
Year: 95																
1.00	E	10/11/95	7.2	10(3)	2(1)	0(1)	1(1)	1(1)	1(1)	78(1)	72(1)	76(1)	27(3)	0.2(3)	153(1)	18
Enoch Creek - (05-321)																
Year: 95																
1.40	E	07/31/95	7.7	7(3)	3(3)	1(1)	0(1)	2(3)	1(1)	27(5)	10(5)	25(5)	2(1)	0.0(5)	1884(5)	38
1.40	E	10/11/95	7.7	8(3)	5(3)	0(1)	0(1)	1(1)	1(1)	62(1)	9(5)	66(1)	7(1)	0.3(5)	250(3)	26
Prairie Creek - (05-322)																
Year: 95																
6.20	E	08/01/95	2.4	11(5)	5(5)	0(1)	0(1)	0(1)	1(1)	77(1)	36(1)	29(5)	55(5)	0.0(5)	32(1)*	32

▲ - IBI is low end adjusted.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of						Percent of Individuals						
River Mile	Type	Date	Drainage area (sq mi)	Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
1.10	E	08/16/95	7.9	11(3)	4(3)	0(1)	0(1)	2(3)	2(1)	77(1)	50(1)	65(1)	29(3)	0.0(5)	55(1)	24
1.10	E	10/11/95	7.9	11(3)	4(3)	0(1)	0(1)	1(1)	1(1)	79(1)	28(3)	67(1)	28(3)	0.6(3)	57(1)	22
Thompson Ditch - (05-323)																
Year: 95																
1.70	E	10/12/95	2.2	7(3)	4(3)	0(1)	0(1)	1(1)	0(1)	79(1)	52(1)	90(1)	21(3)	0.0(5)	13(1)*	22
Blood Run - (05-324)																
Year: 95																
1.40	E	08/04/95	3.7	3(1)	2(1)	0(1)	0(1)	0(1)	1(1)	99(1)	30(1)	69(1)	0(1)	0.0(5)	6(1)	16
1.40	E	10/10/95	3.7	4(1)	3(3)	0(1)	0(1)	0(1)	1(1)	94(1)	12(5)	83(1)	0(1)	0.0(5)	9(1)*	22

▲ - IBI is low end adjusted.

IBI component metrics for sites sampled in the upper Scioto River Basin and streams in the vicinity of AgriGeneral's LaRue Farms,1995.

				Number of					Percent of Individuals								
River Mile	Type	Date	Drainage area (sq mi)	Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
Little Sandusky R. - (05033)																	
Year: 95																	
3.70	D	08/15/95	26	13(3)	1(1)	1(1)	0(1)	2(3)	22(3)	79(1)	13(5)	0.0(1)	33(3)	1.0(3)	148(1)	26	5.8
3.70	D	10/11/95	26	14(3)	2(3)	1(1)	0(1)	2(3)	20(3)	77(1)	17(5)	0.2(1)	27(3)	0.0(5)	270(3)	32	6.0
Tymochtee Creek - (05300)																	
Year: 95																	
47.30	D	10/11/95	35	13(3)	3(3)	1(1)	0(1)	1(1)	10(1)	81(1)	27(3)	1.2(3)	63(5)	0.0(5)	48(1)	28	5.7
47.30	D	08/16/95	35	16(3)	4(5)	2(3)	0(1)	1(1)	8(1)	79(1)	16(5)	5.3(5)	70(5)	2.7(1)	60(1)	32	6.3
42.80	D	08/16/95	64	16(3)	2(3)	2(3)	0(1)	5(5)	16(1)	69(1)	10(5)	0.7(1)	85(5)	0.7(3)	73(1)	32	7.0
42.80	D	10/12/95	64	20(3)	2(3)	1(1)	0(1)	5(5)	11(1)	73(1)	42(1)	0.5(1)	50(3)	0.0(5)	186(1)	26	6.6
38.90	D	08/15/95	136	21(3)	4(5)	2(1)	1(1)	3(3)	12(1)	58(1)	27(3)	1.6(3)	53(3)	0.0(5)	167(1)	30	7.2
38.90	D	10/12/95	136	24(5)	4(5)	3(3)	1(1)	5(3)	17(1)	66(1)	28(3)	1.6(3)	65(5)	0.8(3)	172(1)	34	7.6

na - Qualitative data, Modified Iwb not applicable.
▲ - IBI is low-end adjusted.
● - One or more species excluded from IBI calculation.

Species List

River Code: **02-001** River Mile: **233.60**	Stream: **Scioto River** Basin: Scioto River Time Fished: 3994 sec Drain Area: 25.0 sq mi Dist Fished: 0.35 km No of Passes: 2	Sample Date: **1995** Date Range: 07/10/95 Thru: 08/17/95 Sampler Type: D 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
GRASS PICKEREL		P	M	P	1	1.00	0.12	0.10	1.32	100.00
NORTHERN HOG SUCKER	R	I	S	M	1	1.00	0.12	0.08	1.09	82.00
WHITE SUCKER	W	O	S	T	57	50.50	6.28	1.61	21.33	30.21
BLACKNOSE DACE	N	G	S	T	72	69.25	8.61	0.21	2.82	3.03
CREEK CHUB	N	G	N	T	239	216.25	26.88	2.71	35.87	12.54
REDFIN SHINER	N	I	N		1	1.00	0.12	0.00	0.03	2.00
STRIPED SHINER	N	I	S		25	24.00	2.98	0.25	3.25	10.00
SPOTFIN SHINER	N	I	M		1	1.00	0.12	0.01	0.07	5.00
SAND SHINER	N	I	M	M	22	21.25	2.64	0.04	0.47	1.68
SILVERJAW MINNOW	N	I	M		21	17.25	2.14	0.06	0.74	3.24
BLUNTNOSE MINNOW	N	O	C	T	41	39.25	4.88	0.10	1.29	2.51
CENTRAL STONEROLLER	N	H	N		176	172.50	21.44	0.95	12.62	5.51
YELLOW BULLHEAD		I	C	T	10	8.75	1.09	0.43	5.72	48.40
BL'KSTRIPE TOPMINNOW		I	M		3	2.25	0.28	0.00	0.06	2.00
ROCK BASS	S	C	C		1	1.00	0.12	0.13	1.72	130.00
LARGEMOUTH BASS	F	C	C		3	3.00	0.37	0.13	1.74	43.67
GREEN SUNFISH	S	I	C	T	2	2.00	0.25	0.02	0.32	12.00
LONGEAR SUNFISH	S	I	C	M	1	1.00	0.12	0.02	0.29	22.00
BLACKSIDE DARTER	D	I	S		11	10.25	1.27	0.04	0.52	3.91
LOGPERCH	D	I	S	M	9	8.75	1.09	0.07	0.96	8.17
JOHNNY DARTER	D	I	C		72	64.75	8.05	0.08	1.05	1.20
GREENSIDE DARTER	D	I	S	M	10	10.00	1.24	0.04	0.59	4.44
BANDED DARTER	D	I	S	I	1	1.00	0.12	0.00	0.01	1.00
RAINBOW DARTER	D	I	S	M	4	4.00	0.50	0.01	0.13	2.50
ORANGETHROAT DARTER	D	I	S		25	22.25	2.77	0.03	0.46	1.56
MOTTLED SCULPIN		I	C		55	51.25	6.37	0.42	5.56	8.36
	Mile Total				864	804.50		7.55		
	Number of Species				26					
	Number of Hybrids				0					

Species List

River Code: **02-001** River Mile: **231.70**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4529 sec Drain Area: 30.0 sq mi Dist Fished: 0.35 km No of Passes: 2	Sample Date: **1995** Date Range: 07/11/95 Thru: 08/17/95 Sampler Type: D 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
GRASS PICKEREL		P	M	P	1	1.00	0.10	0.01	0.04	10.00
NORTHERN HOG SUCKER	R	I	S	M	16	14.50	1.49	0.83	3.59	55.19
WHITE SUCKER	W	O	S	T	197	169.50	17.36	8.34	36.08	47.94
COMMON CARP	G	O	M	T	3	2.25	0.23	4.91	21.25	2,183.33
BLACKNOSE DACE	N	G	S	T	19	15.25	1.56	0.05	0.21	3.16
CREEK CHUB	N	G	N	T	407	333.25	34.14	5.68	24.56	16.74
STRIPED SHINER	N	I	S		68	58.25	5.97	0.69	2.99	12.05
SAND SHINER	N	I	M	M	14	11.25	1.15	0.02	0.10	2.18
SILVERJAW MINNOW	N	I	M		15	14.00	1.43	0.04	0.16	2.73
BLUNTNOSE MINNOW	N	O	C	T	26	20.00	2.05	0.06	0.26	2.96
CENTRAL STONEROLLER	N	H	N		98	89.50	9.17	0.89	3.86	9.75
YELLOW BULLHEAD		I	C	T	2	1.50	0.15	0.13	0.55	85.00
TADPOLE MADTOM		I	C		2	1.75	0.18	0.01	0.05	7.00
GREEN SUNFISH	S	I	C	T	3	2.50	0.26	0.02	0.10	9.33
BLUEGILL SUNFISH	S	I	C	P	8	6.25	0.64	0.01	0.03	1.13
BLACKSIDE DARTER	D	I	S		14	10.75	1.10	0.03	0.13	2.86
LOGPERCH	D	I	S	M	19	15.25	1.56	0.08	0.33	5.05
JOHNNY DARTER	D	I	C		18	13.75	1.41	0.02	0.10	1.72
GREENSIDE DARTER	D	I	S	M	29	23.25	2.38	0.09	0.38	3.79
BANDED DARTER	D	I	S	I	2	1.50	0.15	0.00	0.02	2.50
RAINBOW DARTER	D	I	S	M	21	16.50	1.69	0.03	0.13	1.81
ORANGETHROAT DARTER	D	I	S		3	2.50	0.26	0.00	0.02	1.67
MOTTLED SCULPIN		I	C		179	152.00	15.57	1.17	5.07	7.96
	Mile Total				1,164	976.25		23.12		
	Number of Species				23					
	Number of Hybrids				0					

Species List

River Code: **02-001** River Mile: **226.30**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4309 sec Drain Area: 47.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/11/95 Thru: 08/24/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GRASS PICKEREL		P	M	P	5	3.75	0.49	0.22	2.02	57.60
NORTHERN HOG SUCKER	R	I	S	M	7	5.25	0.69	0.16	1.47	30.00
WHITE SUCKER	W	O	S	T	54	40.50	5.32	1.24	11.57	30.51
COMMON CARP	G	O	M	T	9	6.75	0.89	3.98	37.28	590.00
CREEK CHUB	N	G	N	T	76	57.00	7.49	0.91	8.53	15.99
REDFIN SHINER	N	I	N		5	3.75	0.49	0.01	0.10	2.80
STRIPED SHINER	N	I	S		74	55.50	7.29	0.58	5.43	10.45
SPOTFIN SHINER	N	I	M		10	7.50	0.99	0.03	0.27	3.80
SAND SHINER	N	I	M	M	228	171.00	22.46	0.27	2.57	1.60
SILVERJAW MINNOW	N	I	M		14	10.50	1.38	0.03	0.32	3.21
BLUNTNOSE MINNOW	N	O	C	T	273	204.75	26.90	0.54	5.08	2.65
CENTRAL STONEROLLER	N	H	N		58	43.50	5.71	0.26	2.41	5.92
YELLOW BULLHEAD		I	C	T	32	24.00	3.15	1.15	10.74	47.78
STONECAT MADTOM		I	C	I	1	0.75	0.10	0.03	0.32	45.00
TADPOLE MADTOM		I	C		10	7.50	0.99	0.06	0.51	7.30
BL'KSTRIPE TOPMINNOW		I	M		9	6.75	0.89	0.01	0.11	1.67
ROCK BASS	S	C	C		2	1.50	0.20	0.01	0.06	4.00
LARGEMOUTH BASS	F	C	C		2	1.50	0.20	0.17	1.54	110.00
GREEN SUNFISH	S	I	C	T	26	19.50	2.56	0.20	1.91	10.47
BLUEGILL SUNFISH	S	I	C	P	5	3.75	0.49	0.04	0.41	11.60
LONGEAR SUNFISH	S	I	C	M	44	33.00	4.33	0.64	5.98	19.37
BLACKSIDE DARTER	D	I	S		19	14.25	1.87	0.05	0.44	3.26
LOGPERCH	D	I	S	M	11	8.25	1.08	0.04	0.39	5.00
JOHNNY DARTER	D	I	C		14	10.50	1.38	0.02	0.14	1.43
GREENSIDE DARTER	D	I	S	M	12	9.00	1.18	0.03	0.28	3.25
BANDED DARTER	D	I	S	I	8	6.00	0.79	0.01	0.07	1.25
ORANGETHROAT DARTER	D	I	S		6	4.50	0.59	0.01	0.07	1.50
MOTTLED SCULPIN		I	C		1	0.75	0.10	0.00	0.01	2.00
	Mile Total				1,015	761.25		10.68		
	Number of Species				28					
	Number of Hybrids				0					

Species List

River Code: **02-001** River Mile: **221.90**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4307 sec Drain Area: 76.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/05/95 Thru: 08/24/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GRASS PICKEREL		P	M	P	9	6.75	2.16	0.17	0.45	24.89
QUILLBACK CARPSUCKER	C	O	M		1	0.75	0.24	0.17	0.46	230.00
SILVER REDHORSE	R	I	S	M	3	2.25	0.72	0.21	0.56	92.67
GOLDEN REDHORSE	R	I	S	M	19	14.25	4.57	3.09	8.30	216.58
NORTHERN HOG SUCKER	R	I	S	M	7	5.25	1.68	0.34	0.91	64.29
WHITE SUCKER	W	O	S	T	79	59.25	18.99	4.41	11.85	74.41
COMMON CARP	G	O	M	T	34	25.50	8.17	21.66	58.23	849.24
CREEK CHUB	N	G	N	T	3	2.25	0.72	0.13	0.35	58.67
REDFIN SHINER	N	I	N		20	15.00	4.81	0.03	0.09	2.25
STRIPED SHINER	N	I	S		24	18.00	5.77	0.52	1.39	28.75
SPOTFIN SHINER	N	I	M		23	17.25	5.53	0.08	0.21	4.61
SAND SHINER	N	I	M	M	5	3.75	1.20	0.01	0.02	2.00
BLUNTNOSE MINNOW	N	O	C	T	45	33.75	10.82	0.12	0.32	3.56
CENTRAL STONEROLLER	N	H	N		1	0.75	0.24	0.01	0.02	12.00
CHANNEL CATFISH	F		C		7	5.25	1.68	3.08	8.29	587.14
YELLOW BULLHEAD		I	C	T	30	22.50	7.21	1.76	4.72	78.07
STONECAT MADTOM		I	C	I	2	1.50	0.48	0.06	0.16	40.00
TADPOLE MADTOM		I	C		3	2.25	0.72	0.02	0.06	10.00
BL'KSTRIPE TOPMINNOW		I	M		11	8.25	2.64	0.02	0.06	2.45
WHITE CRAPPIE	S	I	C		2	1.50	0.48	0.20	0.54	135.00
LARGEMOUTH BASS	F	C	C		3	2.25	0.72	0.16	0.43	71.67
GREEN SUNFISH	S	I	C	T	39	29.25	9.38	0.52	1.40	17.74
BLUEGILL SUNFISH	S	I	C	P	2	1.50	0.48	0.02	0.06	15.50
OR'GESPOTTED SUNFISH	S	I	C		1	0.75	0.24	0.01	0.02	8.00
LONGEAR SUNFISH	S	I	C	M	25	18.75	6.01	0.31	0.82	16.32
GREEN SF X LONGEAR					1	0.75	0.24	0.03	0.09	45.00
BLACKSIDE DARTER	D	I	S		6	4.50	1.44	0.01	0.04	3.00
LOGPERCH	D	I	S	M	8	6.00	1.92	0.04	0.11	6.63
JOHNNY DARTER	D	I	C		2	1.50	0.48	0.00	0.01	2.00
GREENSIDE DARTER	D	I	S	M	1	0.75	0.24	0.00	0.01	3.00
	Mile Total				416	312.00		37.19		
	Number of Species				29					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **220.80**	Stream: **Scioto River** Basin: Scioto River Time Fished: 3212 sec Drain Area: 96.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/11/95 Thru: 08/24/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GRASS PICKEREL		P	M	P	6	4.50	1.76	0.03	0.10	5.83
QUILLBACK CARPSUCKER	C	O	M		4	3.00	1.18	0.92	3.47	306.25
SILVER REDHORSE	R	I	S	M	1	0.75	0.29	0.08	0.28	100.00
GOLDEN REDHORSE	R	I	S	M	13	9.75	3.82	3.22	12.16	330.31
WHITE SUCKER	W	O	S	T	51	38.25	15.00	2.79	10.53	72.94
COMMON CARP	G	O	M	T	20	15.00	5.88	17.10	64.53	1,139.69
CREEK CHUB	N	G	N	T	2	1.50	0.59	0.08	0.31	55.00
REDFIN SHINER	N	I	N		2	1.50	0.59	0.00	0.02	2.50
STRIPED SHINER	N	I	S		10	7.50	2.94	0.12	0.44	15.50
SPOTFIN SHINER	N	I	M		15	11.25	4.41	0.05	0.17	4.07
SAND SHINER	N	I	M	M	2	1.50	0.59	0.00	0.02	3.00
FATHEAD MINNOW	N	O	C	T	1	0.75	0.29	0.00	0.01	2.00
BLUNTNOSE MINNOW	N	O	C	T	55	41.25	16.18	0.10	0.36	2.33
CHANNEL CATFISH	F		C		1	0.75	0.29	0.19	0.73	257.00
YELLOW BULLHEAD		I	C	T	11	8.25	3.24	0.63	2.36	75.73
BLACK BULLHEAD		I	C	P	1	0.75	0.29	0.09	0.34	120.00
TADPOLE MADTOM		I	C		1	0.75	0.29	0.00	0.01	4.00
BL'KSTRIPE TOPMINNOW		I	M		7	5.25	2.06	0.01	0.03	1.57
LARGEMOUTH BASS	F	C	C		2	1.50	0.59	0.23	0.87	153.50
GREEN SUNFISH	S	I	C	T	62	46.50	18.24	0.38	1.45	8.26
LONGEAR SUNFISH	S	I	C	M	36	27.00	10.59	0.39	1.46	14.35
BLACKSIDE DARTER	D	I	S		25	18.75	7.35	0.05	0.19	2.72
LOGPERCH	D	I	S	M	9	6.75	2.65	0.04	0.14	5.56
JOHNNY DARTER	D	I	C		2	1.50	0.59	0.00	0.01	2.00
GREENSIDE DARTER	D	I	S	M	1	0.75	0.29	0.00	0.02	5.00
	Mile Total				340	255.00		26.49		
	Number of Species				25					
	Number of Hybrids				0					

Species List

River Code: **02-001** River Mile: **216.20**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4451 sec Drain Area: 117.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/12/95 Thru: 08/17/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		1	0.75	0.12	0.02	0.11	28.00
QUILLBACK CARPSUCKER	C	O	M		1	0.75	0.12	0.21	1.07	280.00
SILVER REDHORSE	R	I	S	M	3	2.25	0.36	0.24	1.24	108.33
GOLDEN REDHORSE	R	I	S	M	14	10.50	1.68	1.75	8.91	166.29
NORTHERN HOG SUCKER	R	I	S	M	43	32.25	5.16	2.58	13.17	80.08
WHITE SUCKER	W	O	S	T	35	26.25	4.20	1.77	9.01	67.29
COMMON CARP	G	O	M	T	10	7.50	1.20	9.02	46.02	1,203.00
CREEK CHUB	N	G	N	T	6	4.50	0.72	0.07	0.37	16.00
REDFIN SHINER	N	I	N		38	28.50	4.56	0.05	0.25	1.72
STRIPED SHINER	N	I	S		70	52.50	8.39	0.54	2.75	10.26
SPOTFIN SHINER	N	I	M		40	30.00	4.80	0.12	0.60	3.92
SAND SHINER	N	I	M	M	214	160.50	25.66	0.27	1.37	1.67
FATHEAD MINNOW	N	O	C	T	1	0.75	0.12	0.00	0.01	1.00
BLUNTNOSE MINNOW	N	O	C	T	140	105.00	16.79	0.20	1.01	1.88
CENTRAL STONEROLLER	N	H	N		13	9.75	1.56	0.04	0.18	3.62
CHANNEL CATFISH	F		C		5	3.75	0.60	0.76	3.90	203.60
YELLOW BULLHEAD		I	C	T	6	4.50	0.72	0.48	2.45	106.67
STONECAT MADTOM		I	C	I	6	4.50	0.72	0.12	0.63	27.33
ROCK BASS	S	C	C		8	6.00	0.96	0.31	1.56	50.75
LARGEMOUTH BASS	F	C	C		6	4.50	0.72	0.15	0.77	33.33
GREEN SUNFISH	S	I	C	T	20	15.00	2.40	0.30	1.51	19.70
BLUEGILL SUNFISH	S	I	C	P	1	0.75	0.12	0.00	0.02	4.00
OR'GESPOTTED SUNFISH	S	I	C		1	0.75	0.12	0.00	0.01	3.00
LONGEAR SUNFISH	S	I	C	M	27	20.25	3.24	0.27	1.39	13.44
GREEN SF X LONGEAR					3	2.25	0.36	0.08	0.40	35.00
BLACKSIDE DARTER	D	I	S		21	15.75	2.52	0.03	0.16	2.00
LOGPERCH	D	I	S	M	34	25.50	4.08	0.15	0.76	5.82
JOHNNY DARTER	D	I	C		11	8.25	1.32	0.01	0.04	1.00
GREENSIDE DARTER	D	I	S	M	37	27.75	4.44	0.06	0.29	2.05
BANDED DARTER	D	I	S	I	14	10.50	1.68	0.01	0.06	1.00
RAINBOW DARTER	D	I	S	M	2	1.50	0.24	0.00	0.02	2.00
ORANGETHROAT DARTER	D	I	S		2	1.50	0.24	0.00	0.01	0.50
FANTAIL DARTER	D	I	C		1	0.75	0.12	0.00	0.02	4.00
	Mile Total				834	625.50		19.61		
	Number of Species				32					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **213.90**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4135 sec Drain Area: 129.0 sq mi Dist Fished: 0.42 km No of Passes: 2	Sample Date: **1995** Date Range: 07/12/95 Thru: 08/17/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		2	1.36	0.58	0.04	0.49	32.50
QUILLBACK CARPSUCKER	C	O	M		1	0.68	0.29	0.24	2.64	350.00
SILVER REDHORSE	R	I	S	M	1	0.68	0.29	0.02	0.17	22.00
GOLDEN REDHORSE	R	I	S	M	7	4.84	2.05	0.84	9.29	175.29
NORTHERN HOG SUCKER	R	I	S	M	4	2.73	1.15	0.32	3.58	118.50
WHITE SUCKER	W	O	S	T	10	7.23	3.05	0.20	2.18	27.80
COMMON CARP	G	O	M	T	5	3.41	1.44	3.39	37.49	993.00
REDFIN SHINER	N	I	N		6	4.36	1.84	0.01	0.10	2.00
STRIPED SHINER	N	I	S		23	16.70	7.06	0.12	1.35	7.35
SPOTFIN SHINER	N	I	M		5	3.41	1.44	0.01	0.08	2.00
SAND SHINER	N	I	M	M	30	21.95	9.28	0.05	0.51	2.10
BLUNTNOSE MINNOW	N	O	C	T	38	26.93	11.38	0.07	0.79	2.63
CHANNEL CATFISH	F		C		4	2.80	1.18	0.46	5.05	166.75
YELLOW BULLHEAD		I	C	T	16	11.39	4.81	1.62	17.98	143.31
STONECAT MADTOM		I	C	I	2	1.36	0.58	0.05	0.60	39.50
TADPOLE MADTOM		I	C		4	2.93	1.24	0.03	0.37	11.25
BL'KSTRIPE TOPMINNOW		I	M		1	0.68	0.29	0.00	0.01	1.00
ROCK BASS	S	C	C		18	12.89	5.45	0.51	5.65	40.00
LARGEMOUTH BASS	F	C	C		1	0.68	0.29	0.00	0.02	2.00
GREEN SUNFISH	S	I	C	T	27	19.70	8.33	0.33	3.65	16.84
BLUEGILL SUNFISH	S	I	C	P	3	2.18	0.92	0.01	0.12	5.00
LONGEAR SUNFISH	S	I	C	M	49	34.36	14.52	0.51	5.59	14.61
GREEN SF X LONGEAR					3	2.05	0.86	0.05	0.58	25.33
BLACKSIDE DARTER	D	I	S		35	24.61	10.40	0.06	0.70	2.56
LOGPERCH	D	I	S	M	13	9.00	3.80	0.06	0.66	6.54
JOHNNY DARTER	D	I	C		8	5.73	2.42	0.01	0.08	1.25
GREENSIDE DARTER	D	I	S	M	12	8.45	3.57	0.03	0.28	2.92
BANDED DARTER	D	I	S	I	2	1.36	0.58	0.00	0.02	1.00
RAINBOW DARTER	D	I	S	M	1	0.75	0.32	0.00	0.01	1.00
ORANGETHROAT DARTER	D	I	S		1	0.68	0.29	0.00	0.01	1.00
FANTAIL DARTER	D	I	C		1	0.68	0.29	0.00	0.01	1.00
	Mile Total				333	236.59		9.03		
	Number of Species				30					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **212.80**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4088 sec Drain Area: 160.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/12/95 Thru: 08/24/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		5	3.75	0.83	0.37	1.59	99.60
GRASS PICKEREL		P	M	P	3	2.25	0.50	0.04	0.17	17.33
QUILLBACK CARPSUCKER	C	O	M		2	1.50	0.33	0.69	2.95	461.00
SILVER REDHORSE	R	I	S	M	3	2.25	0.50	0.65	2.77	288.33
GOLDEN REDHORSE	R	I	S	M	29	21.75	4.83	5.39	22.98	247.61
NORTHERN HOG SUCKER	R	I	S	M	1	0.75	0.17	0.03	0.11	33.00
WHITE SUCKER	W	O	S	T	23	17.25	3.83	1.65	7.03	95.57
SPOTTED SUCKER	R	I	S		1	0.75	0.17	0.02	0.09	28.00
COMMON CARP	G	O	M	T	6	4.50	1.00	6.55	27.95	1,455.83
REDFIN SHINER	N	I	N		62	46.50	10.33	0.10	0.42	2.13
STRIPED SHINER	N	I	S		19	14.25	3.17	0.16	0.68	11.16
SPOTFIN SHINER	N	I	M		11	8.25	1.83	0.03	0.13	3.70
SAND SHINER	N	I	M	M	4	3.00	0.67	0.01	0.03	2.50
FATHEAD MINNOW	N	O	C	T	1	0.75	0.17	0.00	0.01	2.00
BLUNTNOSE MINNOW	N	O	C	T	62	46.50	10.33	0.15	0.64	3.20
YELLOW BULLHEAD		I	C	T	2	1.50	0.33	0.26	1.11	174.00
TADPOLE MADTOM		I	C		1	0.75	0.17	0.01	0.03	8.00
BL'KSTRIPE TOPMINNOW		I	M		3	2.25	0.50	0.00	0.02	2.00
WHITE CRAPPIE	S	I	C		1	0.75	0.17	0.03	0.13	42.00
ROCK BASS	S	C	C		40	30.00	6.67	1.75	7.47	58.38
SMALLMOUTH BASS	F	C	C	M	3	2.25	0.50	0.93	3.96	412.67
LARGEMOUTH BASS	F	C	C		3	2.25	0.50	0.10	0.41	43.00
GREEN SUNFISH	S	I	C	T	162	121.50	27.00	2.68	11.42	22.02
BLUEGILL SUNFISH	S	I	C	P	9	6.75	1.50	0.07	0.30	10.33
OR'GESPOTTED SUNFISH	S	I	C		2	1.50	0.33	0.02	0.10	15.00
LONGEAR SUNFISH	S	I	C	M	95	71.25	15.83	1.41	6.02	19.79
GREEN SF X BLUEGILL					11	8.25	1.83	0.27	1.13	32.09
BLACKSIDE DARTER	D	I	S		15	11.25	2.50	0.03	0.14	2.93
LOGPERCH	D	I	S	M	9	6.75	1.50	0.03	0.14	4.89
JOHNNY DARTER	D	I	C		6	4.50	1.00	0.01	0.04	1.83
GREENSIDE DARTER	D	I	S	M	3	2.25	0.50	0.01	0.03	3.33
RAINBOW DARTER	D	I	S	M	2	1.50	0.33	0.00	0.01	2.00
FANTAIL DARTER	D	I	C		1	0.75	0.17	0.00	0.01	3.00
	Mile Total				600	450.00		23.44		
	Number of Species				32					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **211.50**	Stream: **Scioto River** Basin: Scioto River Time Fished: 5454 sec Drain Area: 165.0 sq mi Dist Fished: 0.60 km No of Passes: 3	Sample Date: **1995** Date Range: 07/10/95 Thru: 09/28/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		31	15.50	3.64	1.03	1.85	66.23
QUILLBACK CARPSUCKER	C	O	M		8	4.00	0.94	1.20	2.15	298.88
SILVER REDHORSE	R	I	S	M	5	2.50	0.59	0.50	0.90	200.00
GOLDEN REDHORSE	R	I	S	M	33	16.50	3.88	3.06	5.51	185.61
NORTHERN HOG SUCKER	R	I	S	M	23	11.50	2.70	0.98	1.75	84.78
WHITE SUCKER	W	O	S	T	77	38.50	9.05	3.95	7.10	102.47
COMMON CARP	G	O	M	T	53	26.50	6.23	28.38	51.04	1,070.75
CREEK CHUB	N	G	N	T	14	7.00	1.65	11.41	20.52	1,629.43
REDFIN SHINER	N	I	N		45	22.50	5.29	0.04	0.07	1.82
STRIPED SHINER	N	I	S		20	10.00	2.35	0.14	0.25	13.80
SPOTFIN SHINER	N	I	M		14	7.00	1.65	0.02	0.04	2.93
SAND SHINER	N	I	M	M	120	60.00	14.10	0.12	0.21	1.94
BLUNTNOSE MINNOW	N	O	C	T	60	30.00	7.05	0.07	0.13	2.32
CHANNEL CATFISH	F		C		6	3.00	0.71	0.39	0.71	130.83
YELLOW BULLHEAD		I	C	T	14	7.00	1.65	0.71	1.27	100.79
BLACK BULLHEAD		I	C	P	1	0.50	0.12	0.02	0.04	45.00
TADPOLE MADTOM		I	C		3	1.50	0.35	0.01	0.02	7.33
BL'KSTRIPE TOPMINNOW		I	M		19	9.50	2.23	0.01	0.01	0.74
WHITE CRAPPIE	S	I	C		2	1.00	0.24	0.11	0.20	109.00
ROCK BASS	S	C	C		43	21.50	5.05	0.98	1.77	45.66
SMALLMOUTH BASS	F	C	C	M	6	3.00	0.71	1.07	1.93	357.00
LARGEMOUTH BASS	F	C	C		8	4.00	0.94	0.13	0.23	31.50
GREEN SUNFISH	S	I	C	T	45	22.50	5.29	0.34	0.61	14.96
BLUEGILL SUNFISH	S	I	C	P	4	2.00	0.47	0.02	0.04	9.75
OR'GESPOTTED SUNFISH	S	I	C		4	2.00	0.47	0.01	0.02	5.75
LONGEAR SUNFISH	S	I	C	M	123	61.50	14.45	0.71	1.27	11.52
GREEN SF X BLUEGILL					4	2.00	0.47	0.08	0.15	41.00
BLACKSIDE DARTER	D	I	S		31	15.50	3.64	0.05	0.09	3.35
LOGPERCH	D	I	S	M	16	8.00	1.88	0.06	0.11	7.38
JOHNNY DARTER	D	I	C		6	3.00	0.71	0.01	0.01	1.83
GREENSIDE DARTER	D	I	S	M	12	6.00	1.41	0.02	0.03	2.92
ORANGETHROAT DARTER	D	I	S		1	0.50	0.12	0.00	0.00	2.00
	Mile Total				851	425.50		55.59		
	Number of Species				31					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **211.30**	Stream: **Scioto River** Basin: Scioto River Time Fished: 1026 sec Drain Area: 165.0 sq mi Dist Fished: 0.10 km No of Passes: 2	Sample Date: **1995** Date Range: 07/12/95 Thru: 08/23/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		1	3.00	0.28	0.09	0.13	30.00
GOLDEN REDHORSE	R	I	S	M	13	39.00	3.69	10.59	15.18	271.54
NORTHERN HOG SUCKER	R	I	S	M	65	195.00	18.47	17.65	25.30	90.52
WHITE SUCKER	W	O	S	T	51	153.00	14.49	10.07	14.44	65.82
COMMON CARP	G	O	M	T	4	12.00	1.14	23.18	33.22	1,931.25
CREEK CHUB	N	G	N	T	1	3.00	0.28	0.02	0.03	8.00
REDFIN SHINER	N	I	N		14	42.00	3.98	0.07	0.10	1.71
STRIPED SHINER	N	I	S		38	114.00	10.80	1.13	1.63	9.95
SAND SHINER	N	I	M	M	24	72.00	6.82	0.13	0.18	1.75
SILVERJAW MINNOW	N	I	M		4	12.00	1.14	0.02	0.03	1.50
BLUNTNOSE MINNOW	N	O	C	T	44	132.00	12.50	0.35	0.50	2.66
BL'KSTRIPE TOPMINNOW		I	M		1	3.00	0.28	0.01	0.01	2.00
ROCK BASS	S	C	C		13	39.00	3.69	4.03	5.78	103.38
LARGEMOUTH BASS	F	C	C		1	3.00	0.28	0.84	1.20	280.00
GREEN SUNFISH	S	I	C	T	6	18.00	1.70	0.10	0.14	5.50
BLUEGILL SUNFISH	S	I	C	P	2	6.00	0.57	0.06	0.09	10.00
LONGEAR SUNFISH	S	I	C	M	17	51.00	4.83	0.72	1.03	14.12
BLACKSIDE DARTER	D	I	S		4	12.00	1.14	0.03	0.05	2.75
LOGPERCH	D	I	S	M	18	54.00	5.11	0.42	0.60	7.72
JOHNNY DARTER	D	I	C		10	30.00	2.84	0.08	0.11	2.50
GREENSIDE DARTER	D	I	S	M	14	42.00	3.98	0.14	0.20	3.36
BANDED DARTER	D	I	S	I	3	9.00	0.85	0.02	0.02	1.67
RAINBOW DARTER	D	I	S	M	4	12.00	1.14	0.02	0.03	2.00
	Mile Total				352	1,056.00		69.77		
	Number of Species				23					
	Number of Hybrids				0					

Species List

River Code: **02-001** River Mile: **211.20**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4803 sec Drain Area: 165.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/12/95 Thru: 08/23/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		1	0.75	0.17	0.03	0.07	33.00
GOLDEN REDHORSE	R	I	S	M	11	8.25	1.84	0.75	2.22	91.36
NORTHERN HOG SUCKER	R	I	S	M	18	13.50	3.02	0.78	2.31	58.11
WHITE SUCKER	W	O	S	T	79	59.25	13.23	3.00	8.82	50.62
SPOTTED SUCKER	R	I	S		2	1.50	0.34	0.54	1.59	361.00
COMMON CARP	G	O	M	T	28	21.00	4.69	23.66	69.61	1,126.79
GOLDEN SHINER	N	I	M	T	1	0.75	0.17	0.00	0.00	2.00
REDFIN SHINER	N	I	N		10	7.50	1.68	0.02	0.07	3.10
STRIPED SHINER	N	I	S		3	2.25	0.50	0.01	0.03	4.00
SPOTFIN SHINER	N	I	M		3	2.25	0.50	0.01	0.03	4.00
SAND SHINER	N	I	M	M	18	13.50	3.02	0.03	0.08	2.11
BLUNTNOSE MINNOW	N	O	C	T	32	24.00	5.36	0.09	0.25	3.59
CENTRAL STONEROLLER	N	H	N		1	0.75	0.17	0.02	0.05	22.00
CHANNEL CATFISH	F		C		6	4.50	1.01	0.42	1.23	92.50
YELLOW BULLHEAD		I	C	T	6	4.50	1.01	0.08	0.23	17.67
TADPOLE MADTOM		I	C		4	3.00	0.67	0.03	0.10	10.75
BL'KSTRIPE TOPMINNOW		I	M		5	3.75	0.84	0.01	0.02	1.40
ROCK BASS	S	C	C		47	35.25	7.87	2.00	5.89	56.77
LARGEMOUTH BASS	F	C	C		13	9.75	2.18	0.44	1.29	44.77
GREEN SUNFISH	S	I	C	T	69	51.75	11.56	0.65	1.90	12.46
BLUEGILL SUNFISH	S	I	C	P	19	14.25	3.18	0.14	0.42	10.00
OR'GESPOTTED SUNFISH	S	I	C		4	3.00	0.67	0.02	0.04	5.00
LONGEAR SUNFISH	S	I	C	M	132	99.00	22.11	1.06	3.13	10.73
GREEN SF X BLUEGILL					3	2.25	0.50	0.04	0.11	17.33
BLACKSIDE DARTER	D	I	S		20	15.00	3.35	0.04	0.13	2.95
LOGPERCH	D	I	S	M	10	7.50	1.68	0.05	0.14	6.50
JOHNNY DARTER	D	I	C		25	18.75	4.19	0.03	0.08	1.36
GREENSIDE DARTER	D	I	S	M	24	18.00	4.02	0.06	0.16	3.03
BANDED DARTER	D	I	S	I	1	0.75	0.17	0.00	0.00	2.00
RAINBOW DARTER	D	I	S	M	2	1.50	0.34	0.00	0.01	2.00
	Mile Total				597	447.75		33.99		
	Number of Species				29					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **210.10**	Stream: **Scioto River** Basin: Scioto River Time Fished: 3748 sec Drain Area: 169.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/07/95 Thru: 08/23/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		8	6.00	0.53	0.20	1.38	33.88
QUILLBACK CARPSUCKER	C	O	M		4	3.00	0.26	0.20	1.36	66.67
SILVER REDHORSE	R	I	S	M	4	3.00	0.26	0.16	1.11	54.50
GOLDEN REDHORSE	R	I	S	M	8	6.00	0.53	0.31	2.13	52.38
NORTHERN HOG SUCKER	R	I	S	M	96	72.00	6.31	3.66	24.83	50.85
WHITE SUCKER	W	O	S	T	84	63.00	5.52	2.22	15.06	35.25
COMMON CARP	G	O	M	T	5	3.75	0.33	1.75	11.85	466.00
CREEK CHUB	N	G	N	T	10	7.50	0.66	0.13	0.90	17.60
REDFIN SHINER	N	I	N		5	3.75	0.33	0.01	0.07	2.80
STRIPED SHINER	N	I	S		69	51.75	4.54	0.52	3.52	10.02
SPOTFIN SHINER	N	I	M		45	33.75	2.96	0.16	1.08	4.71
SAND SHINER	N	I	M	M	332	249.00	21.83	0.57	3.89	2.31
SILVERJAW MINNOW	N	I	M		9	6.75	0.59	0.00	0.02	0.33
BLUNTNOSE MINNOW	N	O	C	T	423	317.25	27.81	0.83	5.66	2.63
CENTRAL STONEROLLER	N	H	N		76	57.00	5.00	0.37	2.48	6.42
YELLOW BULLHEAD		I	C	T	14	10.50	0.92	1.05	7.13	100.07
BLACK BULLHEAD		I	C	P	2	1.50	0.13	0.04	0.29	28.50
TADPOLE MADTOM		I	C		4	3.00	0.26	0.03	0.18	8.75
BL'KSTRIPE TOPMINNOW		I	M		1	0.75	0.07	0.00	0.02	4.00
ROCK BASS	S	C	C		19	14.25	1.25	0.89	6.04	62.53
LARGEMOUTH BASS	F	C	C		6	4.50	0.39	0.16	1.09	35.50
GREEN SUNFISH	S	I	C	T	19	14.25	1.25	0.38	2.59	26.79
BLUEGILL SUNFISH	S	I	C	P	11	8.25	0.72	0.14	0.98	17.45
OR'GESPOTTED SUNFISH	S	I	C		4	3.00	0.26	0.02	0.10	5.00
LONGEAR SUNFISH	S	I	C	M	51	38.25	3.35	0.31	2.11	8.14
LONGEAR SF X B'GILL					1	0.75	0.07	0.02	0.12	24.00
GREEN SF X LONGEAR					2	1.50	0.13	0.09	0.61	60.00
BLACKSIDE DARTER	D	I	S		2	1.50	0.13	0.00	0.03	3.00
LOGPERCH	D	I	S	M	26	19.50	1.71	0.14	0.96	7.24
JOHNNY DARTER	D	I	C		7	5.25	0.46	0.01	0.08	2.14
GREENSIDE DARTER	D	I	S	M	128	96.00	8.42	0.30	2.06	3.16
BANDED DARTER	D	I	S	I	41	30.75	2.70	0.03	0.23	1.10
RAINBOW DARTER	D	I	S	M	5	3.75	0.33	0.01	0.05	2.00
	Mile Total				1,521	1,140.75		14.74		
	Number of Species				31					
	Number of Hybrids				2					

Species List

River Code: **02-001** River Mile: **207.30**	Stream: **Scioto River** Basin: Scioto River Time Fished: 4821 sec Drain Area: 178.0 sq mi Dist Fished: 0.42 km No of Passes: 2	Sample Date: **1995** Date Range: 07/06/95 Thru: 08/16/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
SILVER REDHORSE	R	I	S	M	1	0.75	0.25	0.07	0.31	92.00
GOLDEN REDHORSE	R	I	S	M	23	17.05	5.64	4.14	18.40	241.79
NORTHERN HOG SUCKER	R	I	S	M	12	8.80	2.91	0.58	2.60	66.75
WHITE SUCKER	W	O	S	T	33	24.41	8.07	2.29	10.18	93.33
SPOTTED SUCKER	R	I	S		1	0.75	0.25	0.31	1.37	410.00
COMMON CARP	G	O	M	T	8	5.93	1.96	9.48	42.12	1,600.52
REDFIN SHINER	N	I	N		35	25.98	8.59	0.07	0.31	2.66
SPOTFIN SHINER	N	I	M		15	11.18	3.70	0.05	0.24	4.80
SAND SHINER	N	I	M	M	6	4.43	1.47	0.01	0.03	1.33
SILVERJAW MINNOW	N	I	M		1	0.68	0.23	0.00	0.00	1.00
FATHEAD MINNOW	N	O	C	T	1	0.75	0.25	0.00	0.01	3.00
BLUNTNOSE MINNOW	N	O	C	T	94	69.41	22.95	0.20	0.90	2.93
YELLOW BULLHEAD		I	C	T	1	0.68	0.23	0.13	0.56	185.00
STONECAT MADTOM		I	C	I	1	0.75	0.25	0.13	0.57	170.00
TADPOLE MADTOM		I	C		2	1.36	0.45	0.01	0.05	8.50
ROCK BASS	S	C	C		27	19.77	6.54	1.90	8.42	96.30
SMALLMOUTH BASS	F	C	C	M	7	5.05	1.67	1.78	7.92	358.57
LARGEMOUTH BASS	F	C	C		4	2.80	0.92	0.15	0.65	53.75
GREEN SUNFISH	S	I	C	T	13	9.27	3.07	0.09	0.41	9.87
BLUEGILL SUNFISH	S	I	C	P	10	7.36	2.43	0.08	0.34	10.30
LONGEAR SUNFISH	S	I	C	M	56	41.32	13.66	0.87	3.87	21.09
BLACKSIDE DARTER	D	I	S		13	9.48	3.13	0.03	0.13	3.08
LOGPERCH	D	I	S	M	12	8.32	2.75	0.08	0.35	9.33
JOHNNY DARTER	D	I	C		6	4.50	1.49	0.01	0.03	1.67
GREENSIDE DARTER	D	I	S	M	21	14.80	4.89	0.05	0.21	3.10
BANDED DARTER	D	I	S	I	6	4.16	1.38	0.01	0.02	1.17
RAINBOW DARTER	D	I	S	M	2	1.36	0.45	0.00	0.01	1.00
FANTAIL DARTER	D	I	C		2	1.36	0.45	0.00	0.01	1.00
	Mile Total				413	302.45		22.52		
	Number of Species				28					
	Number of Hybrids				0					

Species List

River Code: **02-001** River Mile: **203.30**	Stream: **Scioto River** Basin: Scioto River Time Fished: 7135 sec Drain Area: 223.0 sq mi Dist Fished: 1.50 km No of Passes: 3	Sample Date: **1995** Date Range: 07/06/95 Thru: 09/28/95 Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		28	18.67	1.57	3.13	1.10	167.86
QUILLBACK CARPSUCKER	C	O	M		1	0.67	0.06	0.06	0.02	85.00
SILVER REDHORSE	R	I	S	M	235	156.67	13.16	40.29	14.17	257.14
GOLDEN REDHORSE	R	I	S	M	323	215.33	18.09	45.20	15.90	209.92
NORTHERN HOG SUCKER	R	I	S	M	80	53.33	4.48	3.94	1.39	73.84
WHITE SUCKER	W	O	S	T	184	122.67	10.30	14.34	5.04	116.87
SPOTTED SUCKER	R	I	S		4	2.67	0.22	0.61	0.22	229.75
COMMON CARP	G	O	M	T	149	99.33	8.34	152.08	53.51	1,531.02
CREEK CHUB	N	G	N	T	4	2.67	0.22	0.15	0.05	56.50
REDFIN SHINER	N	I	N		30	20.00	1.68	0.03	0.01	1.47
STRIPED SHINER	N	I	S		37	24.67	2.07	0.63	0.22	25.62
SPOTFIN SHINER	N	I	M		129	86.00	7.22	0.40	0.14	4.59
SAND SHINER	N	I	M	M	102	68.00	5.71	0.11	0.04	1.60
BLUNTNOSE MINNOW	N	O	C	T	131	87.33	7.33	0.27	0.09	3.09
CHANNEL CATFISH	F		C		14	9.33	0.78	8.10	2.85	867.86
YELLOW BULLHEAD		I	C	T	5	3.33	0.28	0.84	0.30	251.80
TADPOLE MADTOM		I	C		1	0.67	0.06	0.01	0.00	10.00
WHITE CRAPPIE	S	I	C		1	0.67	0.06	0.09	0.03	140.00
ROCK BASS	S	C	C		98	65.33	5.49	5.89	2.07	90.14
SMALLMOUTH BASS	F	C	C	M	25	16.67	1.40	5.78	2.03	346.60
LARGEMOUTH BASS	F	C	C		13	8.67	0.73	0.48	0.17	55.85
GREEN SUNFISH	S	I	C	T	25	16.67	1.40	0.32	0.11	18.93
BLUEGILL SUNFISH	S	I	C	P	59	39.33	3.30	0.63	0.22	15.93
OR'GESPOTTED SUNFISH	S	I	C		1	0.67	0.06	0.02	0.01	25.00
LONGEAR SUNFISH	S	I	C	M	79	52.67	4.42	0.77	0.27	14.67
GREEN SF X LONGEAR					1	0.67	0.06	0.02	0.01	25.00
BLACKSIDE DARTER	D	I	S		10	6.67	0.56	0.02	0.01	2.90
LOGPERCH	D	I	S	M	7	4.67	0.39	0.03	0.01	7.00
JOHNNY DARTER	D	I	C		4	2.67	0.22	0.01	0.00	2.00
GREENSIDE DARTER	D	I	S	M	2	1.33	0.11	0.00	0.00	2.50
BANDED DARTER	D	I	S	I	1	0.67	0.06	0.00	0.00	2.00
RAINBOW DARTER	D	I	S	M	3	2.00	0.17	0.01	0.00	2.67
	Mile Total				1,786	1,190.67		284.24		
	Number of Species				31					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **192.20**	Stream: **Scioto River** Basin: Scioto River Time Fished: 5549 sec Drain Area: 261.0 sq mi Dist Fished: 1.50 km No of Passes: 3	Sample Date: **1995** Date Range: 07/06/95 Thru: 09/29/95 Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		19	12.67	1.84	0.35	0.34	27.37
NORTHERN PIKE	F	P	M		2	1.33	0.19	2.90	2.82	2,175.00
QUILLBACK CARPSUCKER	C	O	M		8	5.33	0.78	3.76	3.66	705.00
SILVER REDHORSE	R	I	S	M	104	69.33	10.09	17.61	17.15	253.94
GOLDEN REDHORSE	R	I	S	M	123	82.00	11.93	9.64	9.39	117.55
NORTHERN HOG SUCKER	R	I	S	M	3	2.00	0.29	0.17	0.16	83.00
WHITE SUCKER	W	O	S	T	35	23.33	3.39	1.06	1.03	45.40
SPOTTED SUCKER	R	I	S		28	18.67	2.72	0.25	0.24	13.18
COMMON CARP	G	O	M	T	135	90.00	13.09	52.30	50.93	581.09
GOLDFISH	G	O	M	T	1	0.67	0.10	0.07	0.07	108.00
GOLDEN SHINER	N	I	M	T	4	2.67	0.39	0.01	0.01	3.25
CREEK CHUB	N	G	N	T	3	2.00	0.29	0.01	0.01	7.33
REDFIN SHINER	N	I	N		27	18.00	2.62	0.02	0.02	1.33
SPOTFIN SHINER	N	I	M		119	79.33	11.54	0.27	0.26	3.41
SAND SHINER	N	I	M	M	4	2.67	0.39	0.01	0.01	2.00
BLUNTNOSE MINNOW	N	O	C	T	107	71.33	10.38	0.22	0.22	3.15
CHANNEL CATFISH	F		C		22	14.67	2.13	8.15	7.93	555.45
BLACK BULLHEAD		I	C	P	1	0.67	0.10	0.06	0.06	88.00
WHITE CRAPPIE	S	I	C		3	2.00	0.29	0.25	0.24	125.33
ROCK BASS	S	C	C		71	47.33	6.89	3.34	3.25	70.54
SMALLMOUTH BASS	F	C	C	M	1	0.67	0.10	0.10	0.10	148.00
LARGEMOUTH BASS	F	C	C		2	1.33	0.19	0.01	0.01	6.00
GREEN SUNFISH	S	I	C	T	132	88.00	12.80	0.95	0.93	10.83
BLUEGILL SUNFISH	S	I	C	P	1	0.67	0.10	0.01	0.01	12.00
OR'GESPOTTED SUNFISH	S	I	C		18	12.00	1.75	0.28	0.28	23.56
LONGEAR SUNFISH	S	I	C	M	38	25.33	3.69	0.26	0.26	10.34
BLACKSIDE DARTER	D	I	S		9	6.00	0.87	0.02	0.01	2.56
LOGPERCH	D	I	S	M	7	4.67	0.68	0.02	0.02	4.57
BANDED DARTER	D	I	S	I	1	0.67	0.10	0.00	0.00	2.00
RAINBOW DARTER	D	I	S	M	1	0.67	0.10	0.00	0.00	2.00
SAUGER X WALLEYE	E	P			2	1.33	0.19	0.60	0.58	450.00
	Mile Total				1,031	687.33		102.69		
	Number of Species				30					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **178.50**	Stream: **Scioto River** Basin: Scioto River Time Fished: 7036 sec Drain Area: 408.0 sq mi Dist Fished: 1.20 km No of Passes: 3	Sample Date: **1995** Date Range: 07/10/95 Thru: 10/03/95 Sampler Type: A D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		26	13.33	2.00	0.08	0.11	5.23
GRASS PICKEREL		P	M	P	4	2.17	0.33	0.05	0.07	22.50
NORTHERN PIKE	F	P	M		7	4.33	0.65	2.39	3.55	517.14
QUILLBACK CARPSUCKER	C	O	M		2	1.17	0.18	0.60	0.90	453.00
SILVER REDHORSE	R	I	S	M	12	6.83	1.03	3.25	4.84	430.00
GOLDEN REDHORSE	R	I	S	M	73	41.67	6.26	4.47	6.66	108.78
NORTHERN HOG SUCKER	R	I	S	M	85	47.50	7.13	4.43	6.60	90.69
WHITE SUCKER	W	O	S	T	23	12.50	1.88	1.63	2.43	132.00
SPOTTED SUCKER	R	I	S		10	5.83	0.88	0.26	0.39	45.30
COMMON CARP	G	O	M	T	165	86.33	12.96	38.09	56.73	370.08
GOLDFISH	G	O	M	T	28	14.67	2.20	0.29	0.44	20.29
CREEK CHUB	N	G	N	T	1	0.50	0.08	0.05	0.07	95.00
REDFIN SHINER	N	I	N		11	6.67	1.00	0.01	0.02	2.09
STRIPED SHINER	N	I	S		5	3.33	0.50	0.00	0.00	1.00
SPOTFIN SHINER	N	I	M		58	34.67	5.21	0.13	0.19	3.51
SAND SHINER	N	I	M	M	4	2.00	0.30	0.00	0.01	1.75
BLUNTNOSE MINNOW	N	O	C	T	191	108.50	16.29	0.24	0.36	2.19
CHANNEL CATFISH	F		C		12	6.50	0.98	1.61	2.39	201.46
YELLOW BULLHEAD		I	C	T	1	0.50	0.08	0.13	0.20	265.00
BRINDLED MADTOM		I	C	I	1	0.50	0.08	0.01	0.01	15.00
TADPOLE MADTOM		I	C		1	0.50	0.08	0.00	0.00	1.00
BLACK CRAPPIE	S	I	C		7	3.67	0.55	0.03	0.05	8.86
ROCK BASS	S	C	C		107	64.33	9.66	4.90	7.30	73.82
SMALLMOUTH BASS	F	C	C	M	6	3.83	0.58	1.49	2.22	383.67
LARGEMOUTH BASS	F	C	C		7	3.83	0.58	1.02	1.51	223.57
GREEN SUNFISH	S	I	C	T	182	103.67	15.57	0.85	1.26	7.95
BLUEGILL SUNFISH	S	I	C	P	1	0.50	0.08	0.01	0.01	15.00
OR'GESPOTTED SUNFISH	S	I	C		23	13.67	2.05	0.12	0.18	8.77
LONGEAR SUNFISH	S	I	C	M	65	39.17	5.88	0.69	1.02	16.95
GREEN SF X BLUEGILL					2	1.17	0.18	0.02	0.02	12.50
BLACKSIDE DARTER	D	I	S		17	9.83	1.48	0.02	0.04	2.35
LOGPERCH	D	I	S	M	6	3.83	0.58	0.04	0.05	9.08
JOHNNY DARTER	D	I	C		25	12.83	1.93	0.02	0.02	1.28
GREENSIDE DARTER	D	I	S	M	6	3.33	0.50	0.01	0.01	2.50
BANDED DARTER	D	I	S	I	2	1.17	0.18	0.00	0.00	2.00
FANTAIL DARTER	D	I	C		1	0.50	0.08	0.00	0.00	2.00
SAUGER X WALLEYE	E	P			1	0.67	0.10	0.22	0.33	330.00
	Mile Total				1,178	666.00		67.15		
	Number of Species				35					
	Number of Hybrids				2					

Species List

River Code: **02-001** River Mile: **175.70**	Stream: **Scioto River** Basin: Scioto River Time Fished: 8655 sec Drain Area: 526.0 sq mi Dist Fished: 1.50 km No of Passes: 3	Sample Date: **1995** Date Range: 07/10/95 Thru: 09/29/95 Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		5	3.33	1.60	0.13	0.11	38.80
QUILLBACK CARPSUCKER	C	O	M		5	3.33	1.60	3.09	2.63	926.00
SILVER REDHORSE	R	I	S	M	2	1.33	0.64	0.10	0.08	74.50
GOLDEN REDHORSE	R	I	S	M	11	7.33	3.53	1.70	1.45	231.64
NORTHERN HOG SUCKER	R	I	S	M	4	2.67	1.28	0.19	0.16	70.00
WHITE SUCKER	W	O	S	T	9	6.00	2.88	1.45	1.24	242.33
COMMON CARP	G	O	M	T	96	64.00	30.77	106.79	90.99	1,668.52
GOLDFISH	G	O	M	T	3	2.00	0.96	0.04	0.03	18.67
GOLDEN SHINER	N	I	M	T	2	1.33	0.64	0.01	0.01	5.00
REDFIN SHINER	N	I	N		3	2.00	0.96	0.01	0.00	2.67
SPOTFIN SHINER	N	I	M		5	3.33	1.60	0.01	0.01	3.80
BLUNTNOSE MINNOW	N	O	C	T	3	2.00	0.96	0.00	0.00	2.00
CHANNEL CATFISH	F		C		3	2.00	0.96	1.23	1.05	616.67
BLACK CRAPPIE	S	I	C		5	3.33	1.60	0.06	0.05	17.80
ROCK BASS	S	C	C		7	4.67	2.24	0.28	0.24	59.29
SMALLMOUTH BASS	F	C	C	M	1	0.67	0.32	0.01	0.01	18.00
LARGEMOUTH BASS	F	C	C		12	8.00	3.85	0.60	0.51	74.58
GREEN SUNFISH	S	I	C	T	90	60.00	28.85	0.52	0.45	8.73
BLUEGILL SUNFISH	S	I	C	P	13	8.67	4.17	0.06	0.05	6.85
OR'GESPOTTED SUNFISH	S	I	C		13	8.67	4.17	0.05	0.04	5.85
LONGEAR SUNFISH	S	I	C	M	14	9.33	4.49	0.05	0.04	4.86
GREEN SF X BLUEGILL					2	1.33	0.64	0.13	0.11	94.00
BLACKSIDE DARTER	D	I	S		1	0.67	0.32	0.00	0.00	3.00
SAUGER X WALLEYE	E	P			3	2.00	0.96	0.87	0.74	435.67
	Mile Total				312	208.00		117.36		
	Number of Species				22					
	Number of Hybrids				2					

Species List

River Code: **02-001** River Mile: **169.40**	Stream: **Scioto River** Basin: Scioto River Time Fished: 7198 sec Drain Area: 564.0 sq mi Dist Fished: 1.50 km No of Passes: 3	Sample Date: **1995** Date Range: 07/21/95 Thru: 09/29/95 Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		144	96.00	17.16	4.39	3.30	45.68
NORTHERN PIKE	F	P	M		5	3.33	0.60	5.12	3.85	1,535.00
QUILLBACK CARPSUCKER	C	O	M		4	2.67	0.48	1.79	1.35	671.00
SILVER REDHORSE	R	I	S	M	24	16.00	2.86	11.44	8.60	715.21
GOLDEN REDHORSE	R	I	S	M	83	55.33	9.89	21.33	16.04	385.53
NORTHERN HOG SUCKER	R	I	S	M	36	24.00	4.29	4.66	3.51	194.32
WHITE SUCKER	W	O	S	T	41	27.33	4.89	4.93	3.71	180.49
SPOTTED SUCKER	R	I	S		2	1.33	0.24	0.02	0.02	15.00
COMMON CARP	G	O	M	T	36	24.00	4.29	57.40	43.16	2,391.62
SILVER SHINER	N	I	S	I	2	1.33	0.24	0.01	0.00	4.50
REDFIN SHINER	N	I	N		1	0.67	0.12	0.00	0.00	2.00
STRIPED SHINER	N	I	S		1	0.67	0.12	0.00	0.00	3.00
SPOTFIN SHINER	N	I	M		37	24.67	4.41	0.08	0.06	3.27
SAND SHINER	N	I	M	M	3	2.00	0.36	0.00	0.00	2.00
BLUNTNOSE MINNOW	N	O	C	T	89	59.33	10.61	0.12	0.09	1.96
CHANNEL CATFISH	F		C		5	3.33	0.60	1.60	1.20	480.00
BLACK BULLHEAD		I	C	P	1	0.67	0.12	0.05	0.04	78.00
WHITE BASS	F	P	M		1	0.67	0.12	0.14	0.10	204.00
WHITE CRAPPIE	S	I	C		5	3.33	0.60	0.77	0.58	232.40
ROCK BASS	S	C	C		32	21.33	3.81	2.11	1.58	98.69
SMALLMOUTH BASS	F	C	C	M	109	72.67	12.99	14.08	10.59	193.76
LARGEMOUTH BASS	F	C	C		3	2.00	0.36	0.29	0.22	144.67
GREEN SUNFISH	S	I	C	T	21	14.00	2.50	0.20	0.15	14.56
BLUEGILL SUNFISH	S	I	C	P	8	5.33	0.95	0.13	0.10	23.88
OR'GESPOTTED SUNFISH	S	I	C		5	3.33	0.60	0.03	0.02	9.80
LONGEAR SUNFISH	S	I	C	M	20	13.33	2.38	0.28	0.21	21.35
BLACKSIDE DARTER	D	I	S		7	4.67	0.83	0.02	0.01	4.14
LOGPERCH	D	I	S	M	66	44.00	7.87	0.38	0.29	8.67
JOHNNY DARTER	D	I	C		10	6.67	1.19	0.01	0.01	1.20
GREENSIDE DARTER	D	I	S	M	18	12.00	2.15	0.04	0.03	3.37
BANDED DARTER	D	I	S	I	7	4.67	0.83	0.01	0.00	1.29
RAINBOW DARTER	D	I	S	M	6	4.00	0.72	0.01	0.01	2.40
FANTAIL DARTER	D	I	C		1	0.67	0.12	0.00	0.00	2.00
SAUGER X WALLEYE	E	P			6	4.00	0.72	1.55	1.16	386.33
	Mile Total				839	559.33		132.99		
	Number of Species				33					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **160.50**	Stream: **Scioto River** Basin: Scioto River Time Fished: 6459 sec Drain Area: 755.0 sq mi Dist Fished: 1.50 km No of Passes: 3	Sample Date: **1995** Date Range: 07/21/95 Thru: 10/02/95 Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		142	94.67	16.59	3.19	2.30	33.68
SILVER REDHORSE	R	I	S	M	4	2.67	0.47	2.41	1.74	902.25
GOLDEN REDHORSE	R	I	S	M	51	34.00	5.96	15.74	11.38	462.91
NORTHERN HOG SUCKER	R	I	S	M	220	146.67	25.70	37.49	27.10	255.63
WHITE SUCKER	W	O	S	T	17	11.33	1.99	3.94	2.85	347.71
COMMON CARP	G	O	M	T	29	19.33	3.39	31.84	23.01	1,646.77
GOLDFISH	G	O	M	T	1	0.67	0.12	0.13	0.09	190.00
CREEK CHUB	N	G	N	T	1	0.67	0.12	0.04	0.03	64.00
SILVER SHINER	N	I	S	I	7	4.67	0.82	0.03	0.03	7.46
STRIPED SHINER	N	I	S		2	1.33	0.23	0.16	0.12	122.00
SPOTFIN SHINER	N	I	M		12	8.00	1.40	0.03	0.02	3.88
BLUNTNOSE MINNOW	N	O	C	T	25	16.67	2.92	0.04	0.03	2.36
CHANNEL CATFISH	F		C		21	14.00	2.45	6.20	4.48	442.95
STONECAT MADTOM		I	C	I	4	2.67	0.47	0.12	0.08	44.00
WHITE CRAPPIE	S	I	C		2	1.33	0.23	0.36	0.26	267.50
ROCK BASS	S	C	C		96	64.00	11.21	8.60	6.22	134.39
SMALLMOUTH BASS	F	C	C	M	162	108.00	18.93	25.33	18.31	234.58
LARGEMOUTH BASS	F	C	C		10	6.67	1.17	1.97	1.43	295.78
GREEN SUNFISH	S	I	C	T	2	1.33	0.23	0.01	0.01	5.50
BLUEGILL SUNFISH	S	I	C	P	5	3.33	0.58	0.11	0.08	33.40
LONGEAR SUNFISH	S	I	C	M	17	11.33	1.99	0.34	0.24	29.71
LOGPERCH	D	I	S	M	6	4.00	0.70	0.05	0.04	12.17
GREENSIDE DARTER	D	I	S	M	13	8.67	1.52	0.04	0.03	5.15
BANDED DARTER	D	I	S	I	6	4.00	0.70	0.01	0.01	2.17
SAUGER X WALLEYE	E	P			1	0.67	0.12	0.16	0.11	235.00
	Mile Total				856	570.67		138.34		
	Number of Species				24					
	Number of Hybrids				1					

Species List

River Code: **02-001** River Mile: **145.70**	Stream: **Scioto River** Basin: Scioto River Time Fished: 6512 sec Drain Area: 990.0 sq mi Dist Fished: 1.40 km No of Passes: 3	Sample Date: **1995** Date Range: 07/21/95 Thru: 10/02/95 Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		55	41.17	5.35	6.81	3.91	162.96
SILVER REDHORSE	R	I	S	M	1	0.67	0.09	0.03	0.02	40.00
GOLDEN REDHORSE	R	I	S	M	7	4.67	0.61	1.65	0.95	353.29
NORTHERN HOG SUCKER	R	I	S	M	201	151.83	19.72	45.58	26.19	306.00
SPOTTED SUCKER	R	I	S		1	0.83	0.11	0.04	0.02	50.00
COMMON CARP	G	O	M	T	41	27.83	3.61	63.88	36.70	2,306.62
GOLDEN SHINER	N	I	M	T	1	0.83	0.11	0.02	0.01	20.00
RIVER CHUB	N	I	N	I	237	192.67	25.02	7.03	4.04	36.57
ROSYFACE SHINER	N	I	S	I	21	17.50	2.27	0.04	0.02	2.19
STRIPED SHINER	N	I	S		36	27.33	3.55	0.78	0.45	28.85
SPOTFIN SHINER	N	I	M		4	3.17	0.41	0.01	0.00	1.75
BLUNTNOSE MINNOW	N	O	C	T	9	7.33	0.95	0.04	0.02	4.78
CENTRAL STONEROLLER	N	H	N		39	31.83	4.13	1.01	0.58	31.49
CHANNEL CATFISH	F		C		11	7.33	0.95	3.07	1.76	418.00
YELLOW BULLHEAD		I	C	T	1	0.83	0.11	0.02	0.01	20.00
STONECAT MADTOM		I	C	I	3	2.50	0.32	0.05	0.03	20.00
ROCK BASS	S	C	C		56	41.50	5.39	3.79	2.18	93.43
SMALLMOUTH BASS	F	C	C	M	139	103.00	13.38	36.40	20.91	355.00
LARGEMOUTH BASS	F	C	C		2	1.33	0.17	0.17	0.10	129.50
GREEN SUNFISH	S	I	C	T	2	1.67	0.22	0.03	0.02	18.00
BLUEGILL SUNFISH	S	I	C	P	47	32.17	4.18	0.88	0.51	27.83
OR'GESPOTTED SUNFISH	S	I	C		1	0.67	0.09	0.01	0.01	15.00
PUMPKINSEED SUNFISH	S	I	C	P	1	0.67	0.09	0.01	0.00	8.00
GREEN SF X BLUEGILL					1	0.67	0.09	0.02	0.01	30.00
LOGPERCH	D	I	S	M	52	38.17	4.96	0.56	0.32	14.31
GREENSIDE DARTER	D	I	S	M	34	27.83	3.61	0.20	0.12	7.24
SAUGER X WALLEYE	E	P			6	4.00	0.52	1.94	1.11	484.50
	Mile Total				1,009	770.00		174.05		
	Number of Species				25					
	Number of Hybrids				2					

Species List

River Code: **02-166** River Mile: **9.10**	Stream: **McDonald Creek** Basin: Scioto River Time Fished: 3734 sec Drain Area: 2.7 sq mi Dist Fished: 0.32 km No of Passes: 2	Sample Date: **1995** Date Range: 07/31/95 Thru: 10/10/95 Sampler Type: E D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
CREEK CHUB	N	G	N	T	13	12.19	2.26			
FATHEAD MINNOW	N	O	C	T	380	356.25	66.09			
BLUNTNOSE MINNOW	N	O	C	T	155	145.31	26.96			
LARGEMOUTH BASS	F	C	C		13	12.19	2.26			
GREEN SUNFISH	S	I	C	T	6	5.63	1.04			
JOHNNY DARTER	D	I	C		3	2.81	0.52			
ORANGETHROAT DARTER	D	I	S		5	4.69	0.87			
Mile Total					575	539.06				
Number of Species					7					
Number of Hybrids					0					

Species List

River Code: **02-166** River Mile: **6.80**	Stream: **McDonald Creek** Basin: Scioto River Time Fished: 4641 sec Drain Area: 5.8 sq mi Dist Fished: 0.26 km No of Passes: 2	Sample Date: **1995** Date Range: 07/31/95 Thru: 10/10/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
WHITE SUCKER	W	O	S	T	40	46.15	2.71			
COMMON CARP	G	O	M	T	1	1.15	0.07			
CREEK CHUB	N	G	N	T	253	291.92	17.14			
REDFIN SHINER	N	I	N		2	2.31	0.14			
SPOTFIN SHINER	N	I	M		1	1.15	0.07			
FATHEAD MINNOW	N	O	C	T	728	840.00	49.32			
BLUNTNOSE MINNOW	N	O	C	T	322	371.54	21.82			
CENTRAL STONEROLLER	N	H	N		2	2.31	0.14			
BLACK BULLHEAD		I	C	P	1	1.15	0.07			
LARGEMOUTH BASS	F	C	C		15	17.31	1.02			
GREEN SUNFISH	S	I	C	T	17	19.62	1.15			
JOHNNY DARTER	D	I	C		41	47.31	2.78			
ORANGETHROAT DARTER	D	I	S		53	61.15	3.59			
	Mile Total				1,476	1,703.08				
	Number of Species				13					
	Number of Hybrids				0					

Species List

River Code: **02-166** River Mile: **2.70**	Stream: **McDonald Creek** Basin: Scioto River Time Fished: 5008 sec Drain Area: 12.7 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 08/18/95 Thru: 10/10/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
WHITE SUCKER	W	O	S	T	44	33.00	4.95			
COMMON CARP	G	O	M	T	59	44.25	6.64			
CREEK CHUB	N	G	N	T	114	85.50	12.82			
REDFIN SHINER	N	I	N		11	8.25	1.24			
ROSEFIN SHINER	N	I	S	M	1	0.75	0.11			
SPOTFIN SHINER	N	I	M		9	6.75	1.01			
FATHEAD MINNOW	N	O	C	T	74	55.50	8.32			
BLUNTNOSE MINNOW	N	O	C	T	269	201.75	30.26			
YELLOW BULLHEAD		I	C	T	1	0.75	0.11			
BRINDLED MADTOM		I	C	I	1	0.75	0.11			
BL'KSTRIPE TOPMINNOW		I	M		8	6.00	0.90			
SMALLMOUTH BASS	F	C	C	M	10	7.50	1.12			
LARGEMOUTH BASS	F	C	C		2	1.50	0.22			
GREEN SUNFISH	S	I	C	T	99	74.25	11.14			
BLUEGILL SUNFISH	S	I	C	P	2	1.50	0.22			
BLACKSIDE DARTER	D	I	S		10	7.50	1.12			
JOHNNY DARTER	D	I	C		32	24.00	3.60			
GREENSIDE DARTER	D	I	S	M	1	0.75	0.11			
ORANGETHROAT DARTER	D	I	S		142	106.50	15.97			
	Mile Total				889	666.75				
	Number of Species				19					
	Number of Hybrids				0					

Species List

River Code: **02-172** River Mile: **6.80**	Stream: **Wildcat Creek** Basin: Scioto River Time Fished: 4419 sec Drain Area: 5.8 sq mi Dist Fished: 0.30 km No of Passes: 2	Sample Date: **1995** Date Range: 07/07/95 Thru: 08/16/95 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
SILVER REDHORSE	R	I	S	M	1	1.00	0.09			
WHITE SUCKER	W	O	S	T	111	111.00	9.57	3.51	18.80	27.42
SPOTTED SUCKER	R	I	S		3	3.00	0.26	0.09	0.47	44.00
COMMON CARP	G	O	M	T	3	3.00	0.26	0.75	4.02	125.00
CREEK CHUB	N	G	N	T	481	481.00	41.47	7.08	37.91	9.86
REDFIN SHINER	N	I	N		6	6.00	0.52	0.01	0.03	3.00
STRIPED SHINER	N	I	S		87	87.00	7.50	1.24	6.64	10.16
SILVERJAW MINNOW	N	I	M		1	1.00	0.09			
FATHEAD MINNOW	N	O	C	T	1	1.00	0.09	0.01	0.03	3.00
BLUNTNOSE MINNOW	N	O	C	T	126	126.00	10.86	0.66	3.53	3.08
CENTRAL STONEROLLER	N	H	N		126	126.00	10.86	1.09	5.84	8.01
YELLOW BULLHEAD		I	C	T	17	17.00	1.47	1.30	6.98	54.33
BLACK BULLHEAD		I	C	P	11	11.00	0.95	1.36	7.28	226.67
TADPOLE MADTOM		I	C		1	1.00	0.09			
BL'KSTRIPE TOPMINNOW		I	M		13	13.00	1.12	0.03	0.14	2.25
WHITE CRAPPIE	S	I	C		1	1.00	0.09	0.21	1.10	103.00
LARGEMOUTH BASS	F	C	C		3	3.00	0.26	0.03	0.17	16.00
GREEN SUNFISH	S	I	C	T	21	21.00	1.81	0.56	3.00	28.00
BLUEGILL SUNFISH	S	I	C	P	25	25.00	2.16	0.46	2.46	15.33
JOHNNY DARTER	D	I	C		104	104.00	8.97	0.25	1.32	1.56
GREENSIDE DARTER	D	I	S	M	11	11.00	0.95	0.02	0.13	4.00
ORANGETHROAT DARTER	D	I	S		7	7.00	0.60	0.03	0.14	2.60
	Mile Total				1,160	1,160.00		18.67		
	Number of Species				22					
	Number of Hybrids				0					

Species List

River Code: **02-172** River Mile: **0.60**	Stream: **Wildcat Creek** Basin: Scioto River Time Fished: 4354 sec Drain Area: 22.0 sq mi Dist Fished: 0.29 km No of Passes: 2	Sample Date: **1995** Date Range: 07/07/95 Thru: 08/16/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		3	3.21	0.47	0.06	0.71	18.00
SILVER REDHORSE	R	I	S	M	12	12.71	1.84	0.40	4.84	31.08
GOLDEN REDHORSE	R	I	S	M	2	2.14	0.31	0.08	0.94	36.00
NORTHERN HOG SUCKER	R	I	S	M	11	11.64	1.69	1.09	13.38	93.55
WHITE SUCKER	W	O	S	T	137	142.79	20.72	2.55	31.15	17.76
COMMON CARP	G	O	M	T	4	4.14	0.60	0.03	0.40	7.75
CREEK CHUB	N	G	N	T	101	103.43	15.01	2.05	25.05	19.78
REDFIN SHINER	N	I	N		29	30.07	4.36	0.05	0.59	1.62
STRIPED SHINER	N	I	S		27	28.43	4.12	0.35	4.32	12.41
SPOTFIN SHINER	N	I	M		17	17.71	2.57	0.02	0.30	1.39
SAND SHINER	N	I	M	M	5	5.36	0.78	0.01	0.07	1.00
BLUNTNOSE MINNOW	N	O	C	T	124	126.93	18.42	0.41	5.00	3.24
CENTRAL STONEROLLER	N	H	N		8	8.50	1.23	0.07	0.83	8.00
BL'KSTRIPE TOPMINNOW		I	M		2	2.07	0.30	0.00	0.05	2.00
ROCK BASS	S	C	C		6	6.14	0.89	0.35	4.24	56.83
LARGEMOUTH BASS	F	C	C		1	1.07	0.16	0.00	0.01	1.00
GREEN SUNFISH	S	I	C	T	24	25.00	3.63	0.15	1.84	5.95
LONGEAR SUNFISH	S	I	C	M	9	9.43	1.37	0.22	2.65	23.56
BLACKSIDE DARTER	D	I	S		11	11.36	1.65	0.04	0.47	3.36
LOGPERCH	D	I	S	M	8	8.29	1.20	0.07	0.81	8.00
JOHNNY DARTER	D	I	C		60	61.43	8.91	0.06	0.78	1.03
GREENSIDE DARTER	D	I	S	M	33	33.64	4.88	0.08	0.92	2.24
RAINBOW DARTER	D	I	S	M	2	2.14	0.31	0.00	0.02	1.00
ORANGETHROAT DARTER	D	I	S		19	19.21	2.79	0.03	0.34	1.47
FANTAIL DARTER	D	I	C		12	12.36	1.79	0.02	0.28	1.83
	Mile Total				667	689.21		8.18		
	Number of Species				25					
	Number of Hybrids				0					

Species List

River Code: **02-175** River Mile: **9.00**	Stream: **Panther Creek** Basin: Scioto River Time Fished: 4718 sec Drain Area: 7.9 sq mi Dist Fished: 0.30 km No of Passes: 2	Sample Date: **1995** Date Range: 07/13/95 Thru: 08/16/95 Sampler Type: D 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
WHITE SUCKER	W	O	S	T	219	219.00	12.54	15.82	50.23	43.21
CREEK CHUB	N	G	N	T	480	480.00	27.49	7.56	24.02	11.60
REDFIN SHINER	N	I	N		6	6.00	0.34	0.01	0.04	1.50
STRIPED SHINER	N	I	S		156	156.00	8.93	1.98	6.30	8.20
SILVERJAW MINNOW	N	I	M		1	1.00	0.06			
FATHEAD MINNOW	N	O	C	T	14	14.00	0.80	0.04	0.13	2.22
BLUNTNOSE MINNOW	N	O	C	T	192	192.00	11.00	0.62	1.97	2.04
CENTRAL STONEROLLER	N	H	N		572	572.00	32.76	5.01	15.90	5.60
STRIPED SH X CREEK CHUB		I			1	1.00	0.06			
GREEN SUNFISH	S	I	C	T	9	9.00	0.52	0.19	0.60	15.83
BLUEGILL SUNFISH	S	I	C	P	2	2.00	0.11	0.02	0.08	12.00
BLACKSIDE DARTER	D	I	S		1	1.00	0.06	0.01	0.04	7.00
JOHNNY DARTER	D	I	C		34	34.00	1.95	0.06	0.20	1.14
GREENSIDE DARTER	D	I	S	M	3	3.00	0.17	0.03	0.08	4.33
ORANGETHROAT DARTER	D	I	S		49	49.00	2.81	0.11	0.34	1.54
FANTAIL DARTER	D	I	C		7	7.00	0.40	0.02	0.06	1.80
	Mile Total				1,746	1,746.00		31.49		
	Number of Species				15					
	Number of Hybrids				1					

Species List

River Code: **02-175** River Mile: **5.70**	Stream: **Panther Creek** Basin: Scioto River Time Fished: 4483 sec Drain Area: 16.1 sq mi Dist Fished: 0.39 km No of Passes: 2	Sample Date: **1995** Date Range: 07/07/95 Thru: 08/15/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
WHITE SUCKER	W	O	S	T	83	63.79	15.45	1.37	26.77	21.53
CREEK CHUB	N	G	N	T	236	180.79	43.78	3.22	63.10	17.81
REDFIN SHINER	N	I	N		3	2.25	0.54	0.00	0.09	2.00
STRIPED SHINER	N	I	S		6	4.54	1.10	0.06	1.09	12.17
FATHEAD MINNOW	N	O	C	T	4	3.00	0.73	0.01	0.15	2.50
BLUNTNOSE MINNOW	N	O	C	T	20	15.08	3.65	0.05	0.99	3.35
CENTRAL STONEROLLER	N	H	N		31	23.80	5.76	0.13	2.60	5.57
GREEN SUNFISH	S	I	C	T	6	4.62	1.12	0.07	1.40	15.42
BLUEGILL SUNFISH	S	I	C	P	9	6.75	1.63	0.05	0.88	6.67
BLACKSIDE DARTER	D	I	S		1	0.75	0.18	0.00	0.08	5.00
JOHNNY DARTER	D	I	C		43	32.72	7.92	0.03	0.68	1.05
GREENSIDE DARTER	D	I	S	M	1	0.75	0.18	0.00	0.06	4.00
ORANGETHROAT DARTER	D	I	S		95	72.59	17.58	0.11	2.06	1.45
FANTAIL DARTER	D	I	C		2	1.54	0.37	0.01	0.10	3.00
	Mile Total				540	412.97		5.11		
	Number of Species				14					
	Number of Hybrids				0					

River Code: **02-175** River Mile: **1.90**	Stream: **Panther Creek** Basin: Scioto River Time Fished: 4659 sec Drain Area: 22.1 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/06/95 Thru: 08/15/95 Sampler Type: D

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	7	5.25	1.07	0.24	3.29	46.14
WHITE SUCKER	W	O	S	T	131	98.25	20.06	4.13	56.05	42.08
COMMON CARP	G	O	M	T	1	0.75	0.15	0.02	0.26	25.00
CREEK CHUB	N	G	N	T	56	42.00	8.58	1.10	14.97	26.28
REDFIN SHINER	N	I	N		44	33.00	6.74	0.06	0.85	1.91
STRIPED SHINER	N	I	S		49	36.75	7.50	0.48	6.47	12.98
SPOTFIN SHINER	N	I	M		1	0.75	0.15	0.00	0.02	2.00
SAND SHINER	N	I	M	M	15	11.25	2.30	0.02	0.26	1.67
SILVERJAW MINNOW	N	I	M		3	2.25	0.46	0.01	0.09	3.00
BLUNTNOSE MINNOW	N	O	C	T	64	48.00	9.80	0.11	1.55	2.38
CENTRAL STONEROLLER	N	H	N		46	34.50	7.04	0.19	2.62	5.60
ROCK BASS	S	C	C		13	9.75	1.99	0.38	5.18	39.15
SMALLMOUTH BASS	F	C	C	M	1	0.75	0.15	0.12	1.63	160.00
LARGEMOUTH BASS	F	C	C		2	1.50	0.31	0.05	0.65	32.00
GREEN SUNFISH	S	I	C	T	6	4.50	0.92	0.10	1.42	23.17
BLUEGILL SUNFISH	S	I	C	P	17	12.75	2.60	0.12	1.66	9.59
BLACKSIDE DARTER	D	I	S		1	0.75	0.15	0.00	0.04	4.00
LOGPERCH	D	I	S	M	3	2.25	0.46	0.02	0.24	8.00
JOHNNY DARTER	D	I	C		23	17.25	3.52	0.01	0.19	0.82
GREENSIDE DARTER	D	I	S	M	42	31.50	6.43	0.08	1.02	2.38
BANDED DARTER	D	I	S	I	5	3.75	0.77	0.01	0.08	1.60
RAINBOW DARTER	D	I	S	M	42	31.50	6.43	0.05	0.61	1.43
ORANGETHROAT DARTER	D	I	S		62	46.50	9.49	0.05	0.66	1.03
FANTAIL DARTER	D	I	C		19	14.25	2.91	0.02	0.24	1.21
	Mile Total				653	489.75		7.38		
	Number of Species				24					
	Number of Hybrids				0					

River Code: **02-181** River Mile: **4.50**	Stream: **Taylor Creek** Basin: Scioto River Time Fished: 5496 sec Drain Area: 12.0 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/12/95 Thru: 08/25/95 Sampler Type: D

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	4	3.00	0.10	0.17	0.91	55.50
WHITE SUCKER	W	O	S	T	220	165.00	5.50	5.11	27.95	30.99
CREEK CHUB	N	G	N	T	1,554	1,165.50	38.88	4.24	23.18	3.64
REDFIN SHINER	N	I	N		27	20.25	0.68	0.05	0.27	2.46
STRIPED SHINER	N	I	S		304	228.00	7.61	2.55	13.93	11.18
SILVERJAW MINNOW	N	I	M		60	45.00	1.50	0.19	1.01	4.13
BLUNTNOSE MINNOW	N	O	C	T	577	432.75	14.44	1.21	6.64	2.81
CENTRAL STONEROLLER	N	H	N		654	490.50	16.36	2.14	11.71	4.37
YELLOW BULLHEAD		I	C	T	11	8.25	0.28	0.36	1.96	43.36
ROCK BASS	S	C	C		51	38.25	1.28	1.14	6.22	29.73
LARGEMOUTH BASS	F	C	C		2	1.50	0.05	0.01	0.04	5.00
GREEN SUNFISH	S	I	C	T	2	1.50	0.05	0.08	0.44	54.00
BLUEGILL SUNFISH	S	I	C	P	12	9.00	0.30	0.13	0.71	14.50
LONGEAR SUNFISH	S	I	C	M	21	15.75	0.53	0.32	1.72	20.00
BLACKSIDE DARTER	D	I	S		2	1.50	0.05	0.01	0.07	8.00
LOGPERCH	D	I	S	M	10	7.50	0.25	0.07	0.37	9.00
JOHNNY DARTER	D	I	C		64	48.00	1.60	0.06	0.31	1.16
GREENSIDE DARTER	D	I	S	M	64	48.00	1.60	0.15	0.83	3.16
RAINBOW DARTER	D	I	S	M	2	1.50	0.05	0.00	0.02	2.00
ORANGETHROAT DARTER	D	I	S		65	48.75	1.63	0.06	0.30	1.12
FANTAIL DARTER	D	I	C		291	218.25	7.28	0.26	1.41	1.18
	Mile Total				3,997	2,997.75		18.29		
	Number of Species				21					
	Number of Hybrids				0					

Species List

River Code: **02-181** River Mile: **2.10**	Stream: **Taylor Creek** Basin: Scioto River Time Fished: 1318 sec Drain Area: 15.3 sq mi Dist Fished: 0.10 km No of Passes: 2	Sample Date: **1995** Date Range: 07/13/95 Thru: 08/24/95 Sampler Type: D

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	3	9.00	0.33	0.27	1.23	30.33
WHITE SUCKER	W	O	S	T	99	297.00	10.89	6.18	27.78	20.82
CREEK CHUB	N	G	N	T	340	1,020.00	37.40	8.09	36.32	7.93
STRIPED SHINER	N	I	S		26	78.00	2.86	1.06	4.77	13.62
SAND SHINER	N	I	M	M	4	12.00	0.44	0.01	0.04	0.75
SILVERJAW MINNOW	N	I	M		17	51.00	1.87	0.11	0.49	2.12
BLUNTNOSE MINNOW	N	O	C	T	61	183.00	6.71	0.45	2.03	2.47
CENTRAL STONEROLLER	N	H	N		166	498.00	18.26	3.26	14.63	6.54
ROCK BASS	S	C	C		12	36.00	1.32	1.40	6.28	38.83
LONGEAR SUNFISH	S	I	C	M	2	6.00	0.22	0.13	0.59	22.00
GREEN SF X BLUEGILL					1	3.00	0.11	0.07	0.32	24.00
LOGPERCH	D	I	S	M	9	27.00	0.99	0.18	0.81	6.67
JOHNNY DARTER	D	I	C		75	225.00	8.25	0.30	1.33	1.32
GREENSIDE DARTER	D	I	S	M	50	150.00	5.50	0.43	1.91	2.84
BANDED DARTER	D	I	S	I	1	3.00	0.11	0.01	0.03	2.00
RAINBOW DARTER	D	I	S	M	17	51.00	1.87	0.14	0.65	2.82
ORANGETHROAT DARTER	D	I	S		18	54.00	1.98	0.12	0.53	2.17
FANTAIL DARTER	D	I	C		8	24.00	0.88	0.06	0.27	2.50
	Mile Total				909	2,727.00		22.26		
	Number of Species				17					
	Number of Hybrids				1					

Species List

River Code: **02-181** River Mile: **2.00**	Stream: **Taylor Creek** Basin: Scioto River Time Fished: 3985 sec Drain Area: 15.3 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/13/95 Thru: 08/24/95 Sampler Type: D

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	4	3.00	0.30	0.21	1.91	70.00
WHITE SUCKER	W	O	S	T	126	94.50	9.59	3.62	33.01	38.35
CREEK CHUB	N	G	N	T	434	325.50	33.03	2.76	25.15	8.48
REDFIN SHINER	N	I	N		1	0.75	0.08	0.00	0.03	4.00
STRIPED SHINER	N	I	S		37	27.75	2.82	0.45	4.08	16.14
SAND SHINER	N	I	M	M	1	0.75	0.08	0.00	0.01	2.00
SILVERJAW MINNOW	N	I	M		8	6.00	0.61	0.01	0.12	2.25
BLUNTNOSE MINNOW	N	O	C	T	131	98.25	9.97	0.34	3.12	3.49
CENTRAL STONEROLLER	N	H	N		242	181.50	18.42	1.85	16.89	10.22
YELLOW BULLHEAD		I	C	T	2	1.50	0.15	0.14	1.29	94.50
ROCK BASS	S	C	C		33	24.75	2.51	1.00	9.09	40.30
LARGEMOUTH BASS	F	C	C		1	0.75	0.08	0.02	0.14	20.00
GREEN SUNFISH	S	I	C	T	1	0.75	0.08	0.01	0.07	10.00
BLUEGILL SUNFISH	S	I	C	P	2	1.50	0.15	0.03	0.25	18.00
LONGEAR SUNFISH	S	I	C	M	7	5.25	0.53	0.11	0.99	20.71
GREEN SF X BLUEGILL					2	1.50	0.15	0.02	0.20	15.00
BLACKSIDE DARTER	D	I	S		3	2.25	0.23	0.02	0.14	6.67
LOGPERCH	D	I	S	M	7	5.25	0.53	0.04	0.34	7.14
JOHNNY DARTER	D	I	C		179	134.25	13.62	0.18	1.60	1.31
GREENSIDE DARTER	D	I	S	M	42	31.50	3.20	0.10	0.90	3.12
RAINBOW DARTER	D	I	S	M	22	16.50	1.67	0.03	0.31	2.09
ORANGETHROAT DARTER	D	I	S		24	18.00	1.83	0.03	0.30	1.79
FANTAIL DARTER	D	I	C		5	3.75	0.38	0.01	0.08	2.40
	Mile Total				1,314	985.50		10.98		
	Number of Species				22					
	Number of Hybrids				1					

Species List

River Code: **02-181** River Mile: **0.80**	Stream: **Taylor Creek** Basin: Scioto River Time Fished: 3638 sec Drain Area: 16.3 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 07/14/95 Thru: 08/24/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD		O	M		4	3.00	0.29	0.26	1.21	85.00
NORTHERN HOG SUCKER	R	I	S	M	18	13.50	1.29	0.67	3.19	49.72
WHITE SUCKER	W	O	S	T	452	339.00	32.49	10.48	49.84	30.92
SPOTTED SUCKER	R	I	S		1	0.75	0.07	0.34	1.60	450.00
COMMON CARP	G	O	M	T	4	3.00	0.29	0.41	1.95	137.00
CREEK CHUB	N	G	N	T	51	38.25	3.67	0.96	4.59	25.22
REDFIN SHINER	N	I	N		33	24.75	2.37	0.07	0.33	2.76
STRIPED SHINER	N	I	S		45	33.75	3.24	0.52	2.46	15.31
SAND SHINER	N	I	M	M	11	8.25	0.79	0.01	0.06	1.45
SILVERJAW MINNOW	N	I	M		19	14.25	1.37	0.01	0.05	0.79
BLUNTNOSE MINNOW	N	O	C	T	127	95.25	9.13	0.32	1.53	3.38
CENTRAL STONEROLLER	N	H	N		307	230.25	22.07	2.54	12.08	11.04
YELLOW BULLHEAD		I	C	T	6	4.50	0.43	0.35	1.65	77.00
BLACK BULLHEAD		I	C	P	2	1.50	0.14	0.16	0.74	103.50
BL'KSTRIPE TOPMINNOW		I	M		5	3.75	0.36	0.01	0.05	2.60
WHITE CRAPPIE	S	I	C		4	3.00	0.29	0.32	1.50	105.00
ROCK BASS	S	C	C		11	8.25	0.79	0.23	1.07	27.27
LARGEMOUTH BASS	F	C	C		15	11.25	1.08	0.46	2.17	40.53
GREEN SUNFISH	S	I	C	T	24	18.00	1.73	0.34	1.62	18.91
BLUEGILL SUNFISH	S	I	C	P	63	47.25	4.53	0.53	2.54	11.30
LONGEAR SUNFISH	S	I	C	M	93	69.75	6.69	1.42	6.76	20.38
PUMPKINSEED SUNFISH	S	I	C	P	2	1.50	0.14	0.01	0.05	7.50
GREEN SF X BLUEGILL					16	12.00	1.15	0.38	1.79	31.25
BLACKSIDE DARTER	D	I	S		2	1.50	0.14	0.01	0.04	5.00
LOGPERCH	D	I	S	M	22	16.50	1.58	0.13	0.60	7.59
JOHNNY DARTER	D	I	C		15	11.25	1.08	0.02	0.10	1.87
GREENSIDE DARTER	D	I	S	M	37	27.75	2.66	0.09	0.44	3.35
ORANGETHROAT DARTER	D	I	S		2	1.50	0.14	0.00	0.01	1.50
	Mile Total				1,391	1,043.25		21.03		
	Number of Species				27					
	Number of Hybrids				1					

Species List

River Code: **02-182** River Mile: **2.40**	Stream: **Silver Creek** Basin: Scioto River Time Fished: 5403 sec Drain Area: 13.6 sq mi Dist Fished: 0.50 km No of Passes: 3	Sample Date: **1995** Date Range: 07/12/95 Thru: 09/28/95 Sampler Type: D 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
WHITE SUCKER	W	O	S	T	242	146.67	14.66	1.63	22.64	7.10
CREEK CHUB	N	G	N	T	115	67.17	6.71	0.81	11.20	8.53
REDFIN SHINER	N	I	N		46	26.00	2.60	0.09	1.21	2.33
STRIPED SHINER	N	I	S		75	44.83	4.48	0.56	7.78	8.61
SPOTFIN SHINER	N	I	M		1	0.50	0.05	0.01	0.10	9.00
SAND SHINER	N	I	M	M	7	4.67	0.47	0.01	0.07	0.71
SILVERJAW MINNOW	N	I	M		98	59.83	5.98	0.13	1.87	1.71
FATHEAD MINNOW	N	O	C	T	67	37.00	3.70	0.13	1.82	2.33
BLUNTNOSE MINNOW	N	O	C	T	433	234.67	23.45	0.69	9.62	2.08
CENTRAL STONEROLLER	N	H	N		242	121.67	12.16	0.75	10.48	4.17
YELLOW BULLHEAD		I	C	T	31	20.67	2.07	0.09	1.31	3.24
BLACK BULLHEAD		I	C	P	2	1.00	0.10	0.07	0.94	45.00
BL'KSTRIPE TOPMINNOW		I	M		12	8.00	0.80	0.01	0.10	0.58
ROCK BASS	S	C	C		4	2.50	0.25	0.10	1.35	27.50
LARGEMOUTH BASS	F	C	C		22	14.67	1.47	0.34	4.71	16.95
GREEN SUNFISH	S	I	C	T	68	41.50	4.15	0.68	9.41	11.91
BLUEGILL SUNFISH	S	I	C	P	39	23.17	2.32	0.36	5.02	10.15
OR'GESPOTTED SUNFISH	S	I	C		1	0.67	0.07	0.01	0.10	7.00
LONGEAR SUNFISH	S	I	C	M	7	3.83	0.38	0.08	1.15	13.86
REDEAR SUNFISH	E	I	C		1	0.67	0.07	0.01	0.07	5.00
PUMPKINSEED SUNFISH	S	I	C	P	6	4.00	0.40	0.02	0.31	3.67
GREEN SF X BLUEGILL					13	8.67	0.87	0.45	6.27	34.73
GREEN SF X HYBRID					1	0.67	0.07			
BLACKSIDE DARTER	D	I	S		5	3.00	0.30	0.01	0.20	3.20
LOGPERCH	D	I	S	M	1	0.50	0.05	0.01	0.08	7.00
JOHNNY DARTER	D	I	C		121	76.17	7.61	0.06	0.78	0.53
GREENSIDE DARTER	D	I	S	M	26	14.83	1.48	0.06	0.87	3.26
BANDED DARTER	D	I	S	I	3	2.00	0.20	0.00	0.06	1.50
RAINBOW DARTER	D	I	S	M	5	2.50	0.25	0.01	0.08	1.40
ORANGETHROAT DARTER	D	I	S		38	23.00	2.30	0.02	0.30	0.76
FANTAIL DARTER	D	I	C		9	5.67	0.57	0.01	0.17	1.63
	Mile Total				1,741	1,000.67		7.20		
	Number of Species				29					
	Number of Hybrids				2					

Species List

River Code: **02-188** River Mile: **2.40**	Stream: **Cottonwood Ditch** Basin: Scioto River Time Fished: 4539 sec Drain Area: 18.1 sq mi Dist Fished: 0.39 km No of Passes: 2	Sample Date: **1995** Date Range: 07/05/95 Thru: 08/15/95 Sampler Type: D 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
GIZZARD SHAD		O	M		8	6.32	1.07			
GRASS PICKEREL		P	M	P	1	0.75	0.13	0.09	0.25	58.00
QUILLBACK CARPSUCKER	C	O	M		5	3.75	0.64	0.16	0.46	21.00
WHITE SUCKER	W	O	S	T	88	66.04	11.21	5.76	16.61	44.12
SPOTTED SUCKER	R	I	S		1	0.75	0.13	0.66	1.90	440.00
COMMON CARP	G	O	M	T	42	31.62	5.37	16.69	48.17	285.36
CREEK CHUB	N	G	N	T	20	15.32	2.60	0.77	2.21	42.50
REDFIN SHINER	N	I	N		30	22.50	3.82	0.15	0.43	3.33
STRIPED SHINER	N	I	S		19	14.49	2.46	0.54	1.56	27.69
BLUNTNOSE MINNOW	N	O	C	T	131	98.33	16.69	0.52	1.51	2.70
CENTRAL STONEROLLER	N	H	N		4	3.04	0.52	0.08	0.22	16.67
YELLOW BULLHEAD		I	C	T	25	18.91	3.21	1.45	4.18	45.95
BLACK BULLHEAD		I	C	P	5	3.75	0.64	0.44	1.26	58.00
TADPOLE MADTOM		I	C		1	0.75	0.13	0.01	0.02	4.00
BL'KSTRIPE TOPMINNOW		I	M		96	73.86	12.53	0.18	0.52	2.46
LARGEMOUTH BASS	F	C	C		23	17.53	2.97	2.30	6.63	95.75
GREEN SUNFISH	S	I	C	T	227	172.89	29.34	3.99	11.52	16.64
BLUEGILL SUNFISH	S	I	C	P	2	1.58	0.27			
LONGEAR SUNFISH	S	I	C	M	45	34.14	5.79	0.83	2.38	15.71
LOGPERCH	D	I	S	M	2	1.50	0.25	0.06	0.16	19.00
JOHNNY DARTER	D	I	C		2	1.50	0.25	0.01	0.02	2.00
	Mile Total				777	589.30		34.66		
	Number of Species				21					
	Number of Hybrids				0					

River Code: **02-188** River Mile: **0.80**	Stream: **Cottonwood Ditch** Basin: Scioto River Time Fished: 4894 sec Drain Area: 19.8 sq mi Dist Fished: 0.37 km No of Passes: 2	Sample Date: **1995** Date Range: 07/05/95 Thru: 08/15/95 Sampler Type: D 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
GRASS PICKEREL		P	M	P	1	0.75	0.10	0.04	0.07	25.00
QUILLBACK CARPSUCKER	C	O	M		1	0.75	0.10	0.02	0.03	12.00
WHITE SUCKER	W	O	S	T	248	186.26	24.03	26.21	48.57	71.02
SPOTTED SUCKER	R	I	S		8	6.13	0.79	3.21	5.95	305.71
COMMON CARP	G	O	M	T	29	21.88	2.82	14.70	27.24	350.00
CREEK CHUB	N	G	N	T	29	23.74	3.06	0.54	1.00	25.79
REDFIN SHINER	N	I	N		29	22.15	2.86	0.11	0.21	2.84
STRIPED SHINER	N	I	S		7	5.65	0.73	0.12	0.22	20.00
SPOTFIN SHINER	N	I	M		5	3.75	0.48	0.04	0.07	4.80
SAND SHINER	N	I	M	M	2	1.76	0.23			
FATHEAD MINNOW	N	O	C	T	5	3.75	0.48	0.02	0.04	3.00
BLUNTNOSE MINNOW	N	O	C	T	136	108.35	13.98	0.39	0.72	2.95
CENTRAL STONEROLLER	N	H	N		13	11.21	1.45	0.02	0.04	7.50
YELLOW BULLHEAD		I	C	T	34	26.43	3.41	3.38	6.25	83.33
BLACK BULLHEAD		I	C	P	2	1.50	0.19	0.39	0.72	128.50
TADPOLE MADTOM		I	C		3	2.25	0.29	0.05	0.08	10.00
BL'KSTRIPE TOPMINNOW		I	M		64	50.65	6.53	0.12	0.22	1.82
WHITE CRAPPIE	S	I	C		1	0.75	0.10	0.17	0.31	112.00
GREEN SUNFISH	S	I	C	T	333	259.41	33.47	3.92	7.27	10.06
BLUEGILL SUNFISH	S	I	C	P	1	0.75	0.10	0.01	0.01	4.00
LONGEAR SUNFISH	S	I	C	M	30	23.69	3.06	0.50	0.93	15.95
LOGPERCH	D	I	S	M	2	1.63	0.21	0.01	0.02	7.00
JOHNNY DARTER	D	I	C		1	0.75	0.10	0.00	0.01	2.00
GREENSIDE DARTER	D	I	S	M	10	8.56	1.10	0.01	0.02	3.00
RAINBOW DARTER	D	I	S	M	1	0.88	0.11			
ORANGETHROAT DARTER	D	I	S		2	1.76	0.23			
	Mile Total				997	775.15		53.96		
	Number of Species				26					
	Number of Hybrids				0					

River Code: **05-033** River Mile: **10.40**	Stream: **Little Sandusky River** Basin: Sandusky River Time Fished: Drain Area: 5.3 sq mi Dist Fished: 0.04 km No of Passes: 1	Sample Date: **1995** Date Range: 08/01/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
WHITE SUCKER	W	O	S	T	5	37.50	2.33			
COMMON CARP	G	O	M	T	2	15.00	0.93			
CREEK CHUB	N	G	N	T	12	90.00	5.58			
REDFIN SHINER	N	I	N		2	15.00	0.93			
FATHEAD MINNOW	N	O	C	T	139	1,042.50	64.65			
BLUNTNOSE MINNOW	N	O	C	T	36	270.00	16.74			
CENTRAL STONEROLLER	N	H	N		13	97.50	6.05			
BL'KSTRIPE TOPMINNOW		I	M		3	22.50	1.40			
GREEN SUNFISH	S	I	C	T	3	22.50	1.40			
	Mile Total				215	1,612.50				
	Number of Species				9					
	Number of Hybrids				0					

Species List

River Code: **05-033** River Mile: **3.70**	Stream: **Little Sandusky River** Basin: Sandusky River Time Fished: 3811 sec Drain Area: 26.2 sq mi Dist Fished: 0.26 km No of Passes: 2	Sample Date: **1995** Date Range: 08/15/95 Thru: 10/11/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
WHITE SUCKER	W	O	S	T	55	63.46	6.72	1.45	15.82	22.87
GOLDEN SHINER	N	I	M	T	1	1.15	0.12	0.01	0.14	11.00
BLACKNOSE DACE	N	G	S	T	29	33.46	3.55	0.11	1.23	3.37
CREEK CHUB	N	G	N	T	406	468.46	49.63	5.43	59.21	11.60
STRIPED SHINER	N	I	S		61	70.38	7.46	0.42	4.56	5.95
SPOTFIN SHINER	N	I	M		44	50.77	5.38	0.24	2.63	4.75
FATHEAD MINNOW	N	O	C	T	5	5.77	0.61	0.01	0.08	1.20
BLUNTNOSE MINNOW	N	O	C	T	65	75.00	7.95	0.26	2.79	3.42
CENTRAL STONEROLLER	N	H	N		17	19.62	2.08	0.09	0.98	4.59
YELLOW BULLHEAD		I	C	T	4	4.62	0.49	0.23	2.53	50.25
LARGEMOUTH BASS	F	C	C		1	1.15	0.12	0.00	0.05	4.00
GREEN SUNFISH	S	I	C	T	72	83.08	8.80	0.76	8.33	9.20
BLUEGILL SUNFISH	S	I	C	P	1	1.15	0.12	0.00	0.05	4.00
BLACKSIDE DARTER	D	I	S		23	26.54	2.81	0.10	1.09	3.77
JOHNNY DARTER	D	I	C		34	39.23	4.16	0.05	0.52	1.22
Mile Total					818	943.85		9.18		
Number of Species					15					
Number of Hybrids					0					

Species List

River Code: **05-300** River Mile: **51.60**	Stream: **Tymochtee Creek** Basin: Sandusky River Time Fished: 1618 sec Drain Area: 6.1 sq mi Dist Fished: 0.30 km No of Passes: 2	Sample Date: **1995** Date Range: 08/01/95 Thru: 10/10/95 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
WHITE SUCKER	W	O	S	T	36	36.00	3.53			
CREEK CHUB	N	G	N	T	337	337.00	33.04			
STRIPED SHINER	N	I	S		1	1.00	0.10			
FATHEAD MINNOW	N	O	C	T	219	219.00	21.47			
BLUNTNOSE MINNOW	N	O	C	T	200	200.00	19.61			
CENTRAL STONEROLLER	N	H	N		198	198.00	19.41			
YELLOW BULLHEAD		I	C	T	6	6.00	0.59			
GREEN SUNFISH	S	I	C	T	21	21.00	2.06			
BLUEGILL SUNFISH	S	I	C	P	1	1.00	0.10			
JOHNNY DARTER	D	I	C		1	1.00	0.10			
	Mile Total				1,020	1,020.00				
	Number of Species				10					
	Number of Hybrids				0					

Species List

River Code: **05-300** River Mile: **47.30**	Stream: **Tymochtee Creek** Basin: Sandusky River Time Fished: 5847 sec Drain Area: 35.2 sq mi Dist Fished: 0.40 km No of Passes: 2	Sample Date: **1995** Date Range: 08/16/95 Thru: 10/11/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GRASS PICKEREL		P	M	P	12	9.00	3.34	0.48	2.30	53.50
WHITE SUCKER	W	O	S	T	27	20.25	7.52	1.67	7.98	82.59
SPOTTED SUCKER	R	I	S		2	1.50	0.56	0.23	1.08	150.50
COMMON CARP	G	O	M	T	48	36.00	13.37	12.05	57.53	334.80
GOLDEN SHINER	N	I	M	T	1	0.75	0.28	0.00	0.01	2.00
CREEK CHUB	N	G	N	T	27	20.25	7.52	0.82	3.93	40.65
STRIPED SHINER	N	I	S		1	0.75	0.28	0.02	0.11	31.00
SPOTFIN SHINER	N	I	M		4	3.00	1.11	0.03	0.13	9.00
BLUNTNOSE MINNOW	N	O	C	T	3	2.25	0.84	0.01	0.03	2.67
CENTRAL STONEROLLER	N	H	N		2	1.50	0.56	0.05	0.25	35.00
YELLOW BULLHEAD		I	C	T	82	61.50	22.84	2.70	12.88	43.88
BLACK BULLHEAD		I	C	P	23	17.25	6.41	0.99	4.73	57.45
BL'KSTRIPE TOPMINNOW		I	M		11	8.25	3.06	0.01	0.06	1.55
WHITE CRAPPIE	S	I	C		9	6.75	2.51	0.54	2.58	80.00
GREEN SUNFISH	S	I	C	T	99	74.25	27.58	1.24	5.91	16.67
BLUEGILL SUNFISH	S	I	C	P	2	1.50	0.56	0.04	0.17	24.00
OR'GESPOTTED SUNFISH	S	I	C		3	2.25	0.84	0.03	0.16	15.00
GREEN SF X HYBRID					1	0.75	0.28	0.02	0.10	28.00
BLACKSIDE DARTER	D	I	S		1	0.75	0.28	0.01	0.03	8.00
ORANGETHROAT DARTER	D	I	S		1	0.75	0.28	0.01	0.04	12.00
	Mile Total				359	269.25		20.95		
	Number of Species				19					
	Number of Hybrids				1					

Species List

River Code: **05-300** River Mile: **42.80**	Stream: **Tymochtee Creek** Basin: Sandusky River Time Fished: 5296 sec Drain Area: 64.1 sq mi Dist Fished: 0.38 km No of Passes: 2	Sample Date: **1995** Date Range: 08/16/95 Thru: 10/12/95 Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GRASS PICKEREL		P	M	P	1	0.79	0.17	0.04	0.44	47.00
NORTHERN HOG SUCKER	R	I	S	M	4	3.16	0.68	0.08	1.01	26.75
WHITE SUCKER	W	O	S	T	40	31.58	6.80	1.81	21.60	57.31
COMMON CARP	G	O	M	T	5	3.95	0.85	1.05	12.57	267.00
GOLDEN SHINER	N	I	M	T	2	1.58	0.34	0.00	0.05	3.00
CREEK CHUB	N	G	N	T	31	24.47	5.27	0.95	11.38	38.97
REDFIN SHINER	N	I	N		12	9.47	2.04	0.02	0.19	1.67
STRIPED SHINER	N	I	S		2	1.58	0.34	0.02	0.23	12.00
SPOTFIN SHINER	N	I	M		61	48.16	10.37	0.19	2.31	4.02
FATHEAD MINNOW	N	O	C	T	1	0.79	0.17	0.00	0.01	1.00
BLUNTNOSE MINNOW	N	O	C	T	152	120.00	25.85	0.25	2.99	2.09
CENTRAL STONEROLLER	N	H	N		9	7.11	1.53	0.02	0.28	3.33
CHANNEL CATFISH	F		C		1	0.79	0.17	0.83	9.89	1,050.00
YELLOW BULLHEAD		I	C	T	42	33.16	7.14	1.27	15.13	38.24
BLACK BULLHEAD		I	C	P	4	3.16	0.68	0.18	2.17	57.50
BL'KSTRIPE TOPMINNOW		I	M		1	0.79	0.17	0.00	0.02	2.00
WHITE CRAPPIE	S	I	C		6	4.74	1.02	0.32	3.82	67.56
LARGEMOUTH BASS	F	C	C		2	1.58	0.34	0.08	0.92	49.00
GREEN SUNFISH	S	I	C	T	151	119.21	25.68	1.13	13.46	9.47
BLACKSIDE DARTER	D	I	S		8	6.32	1.36	0.02	0.28	3.75
LOGPERCH	D	I	S	M	12	9.47	2.04	0.05	0.58	5.17
JOHNNY DARTER	D	I	C		3	2.37	0.51	0.01	0.10	3.67
GREENSIDE DARTER	D	I	S	M	2	1.58	0.34	0.00	0.05	2.50
RAINBOW DARTER	D	I	S	M	4	3.16	0.68	0.01	0.06	1.50
FANTAIL DARTER	D	I	C		32	25.26	5.44	0.04	0.45	1.50
	Mile Total				588	464.21		8.38		
	Number of Species				25					
	Number of Hybrids				0					

Species List

River Code: **05-300** River Mile: **38.90**	Stream: **Tymochtee Creek** Basin: Sandusky River Time Fished: 6054 sec Drain Area: 136.0 sq mi Dist Fished: 0.46 km No of Passes: 2	Sample Date: **1995** Date Range: 08/15/95 Thru: 10/12/95 Sampler Type: D

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	6	3.91	0.87	0.52	2.30	132.83
WHITE SUCKER	W	O	S	T	36	23.48	5.20	1.61	7.13	68.75
SPOTTED SUCKER	R	I	S		1	0.65	0.14	0.01	0.05	17.00
COMMON CARP	G	O	M	T	20	13.04	2.89	12.57	55.52	963.89
CREEK CHUB	N	G	N	T	40	26.09	5.78	0.63	2.80	24.26
REDFIN SHINER	N	I	N		7	4.57	1.01	0.02	0.08	4.00
STRIPED SHINER	N	I	S		7	4.57	1.01	0.07	0.29	14.29
SPOTFIN SHINER	N	I	M		19	12.39	2.75	0.05	0.24	4.37
SILVERJAW MINNOW	N	I	M		2	1.30	0.29	0.00	0.01	2.00
BLUNTNOSE MINNOW	N	O	C	T	132	86.09	19.08	0.23	1.01	2.66
CENTRAL STONEROLLER	N	H	N		33	21.52	4.77	0.10	0.45	4.70
CHANNEL CATFISH	F		C		3	1.96	0.43	2.12	9.38	1,085.33
YELLOW BULLHEAD		I	C	T	36	23.48	5.20	1.76	7.78	75.00
BLACK BULLHEAD		I	C	P	5	3.26	0.72	0.25	1.09	75.60
STONECAT MADTOM		I	C	I	2	1.30	0.29	0.01	0.06	10.50
BL'KSTRIPE TOPMINNOW		I	M		1	0.65	0.14	0.00	0.00	1.00
WHITE CRAPPIE	S	I	C		7	4.57	1.01	0.31	1.35	66.86
ROCK BASS	S	C	C		9	5.87	1.30	0.87	3.86	148.89
LARGEMOUTH BASS	F	C	C		2	1.30	0.29	0.07	0.31	53.50
GREEN SUNFISH	S	I	C	T	168	109.57	24.28	0.95	4.19	8.66
OR'GESPOTTED SUNFISH	S	I	C		30	19.57	4.34	0.21	0.91	10.50
GREEN SF X HYBRID					6	3.91	0.87	0.08	0.37	21.33
BLACKSIDE DARTER	D	I	S		8	5.22	1.16	0.02	0.09	3.75
LOGPERCH	D	I	S	M	30	19.57	4.34	0.10	0.43	5.00
JOHNNY DARTER	D	I	C		12	7.83	1.73	0.01	0.05	1.50
GREENSIDE DARTER	D	I	S	M	12	7.83	1.73	0.02	0.10	2.83
RAINBOW DARTER	D	I	S	M	3	1.96	0.43	0.00	0.01	1.00
FANTAIL DARTER	D	I	C		55	35.87	7.95	0.04	0.17	1.06
	Mile Total				692	451.30		22.64		
	Number of Species				27					
	Number of Hybrids				1					

Species List

River Code: **05-319** River Mile: **4.00**	Stream: **Pawpaw Run** Basin: Sandusky River Time Fished: 4200 sec Drain Area: 15.0 sq mi Dist Fished: 0.32 km No of Passes: 2	Sample Date: **1995** Date Range: 07/31/95 Thru: 10/11/95 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
WHITE SUCKER	W	O	S	T	50	46.88	6.18			
COMMON CARP	G	O	M	T	2	1.88	0.25			
GOLDEN SHINER	N	I	M	T	3	2.81	0.37			
CREEK CHUB	N	G	N	T	231	216.56	28.55			
REDFIN SHINER	N	I	N		6	5.63	0.74			
BLUNTNOSE MINNOW	N	O	C	T	305	285.94	37.70			
CENTRAL STONEROLLER	N	H	N		56	52.50	6.92			
YELLOW BULLHEAD		I	C	T	17	15.94	2.10			
BLACK BULLHEAD		I	C	P	10	9.38	1.24			
BL'KSTRIPE TOPMINNOW		I	M		26	24.38	3.21			
LARGEMOUTH BASS	F	C	C		9	8.44	1.11			
GREEN SUNFISH	S	I	C	T	13	12.19	1.61			
BLUEGILL SUNFISH	S	I	C	P	20	18.75	2.47			
GREEN SF X HYBRID					11	10.31	1.36			
JOHNNY DARTER	D	I	C		50	46.88	6.18			
	Mile Total				809	758.44				
	Number of Species				14					
	Number of Hybrids				1					

Species List

River Code: **05-319** River Mile: **0.60**	Stream: **Pawpaw Run** Basin: Sandusky River Time Fished: 5684 sec Drain Area: 17.4 sq mi Dist Fished: 0.36 km No of Passes: 2	Sample Date: **1995** Date Range: 08/04/95 Thru: 10/12/95 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
GRASS PICKEREL		P	M	P	6	5.00	0.68	0.28	2.72	56.50
NORTHERN HOG SUCKER	R	I	S	M	1	0.83	0.11	0.03	0.25	31.00
WHITE SUCKER	W	O	S	T	94	78.33	10.68	3.75	36.05	47.86
COMMON CARP	G	O	M	T	144	120.00	16.36	0.40	3.88	3.36
GOLDEN SHINER	N	I	M	T	14	11.67	1.59	0.03	0.31	2.79
CREEK CHUB	N	G	N	T	245	204.17	27.84	3.55	34.11	17.38
REDFIN SHINER	N	I	N		1	0.83	0.11	0.00	0.01	1.00
STRIPED SHINER	N	I	S		3	2.50	0.34	0.03	0.30	12.33
SPOTFIN SHINER	N	I	M		6	5.00	0.68	0.02	0.17	3.50
FATHEAD MINNOW	N	O	C	T	2	1.67	0.23	0.00	0.02	1.50
BLUNTNOSE MINNOW	N	O	C	T	39	32.50	4.43	0.01	0.12	0.39
CENTRAL STONEROLLER	N	H	N		84	70.00	9.55	0.40	3.85	5.72
YELLOW BULLHEAD		I	C	T	10	8.33	1.14	0.03	0.32	4.00
BLACK BULLHEAD		I	C	P	6	5.00	0.68	0.37	3.57	74.17
BL'KSTRIPE TOPMINNOW		I	M		5	4.17	0.57	0.00	0.03	0.75
WHITE CRAPPIE	S	I	C		3	2.50	0.34	0.07	0.68	28.33
LARGEMOUTH BASS	F	C	C		5	4.17	0.57	0.12	1.11	27.60
GREEN SUNFISH	S	I	C	T	80	66.67	9.09	0.72	6.89	10.75
BLUEGILL SUNFISH	S	I	C	P	44	36.67	5.00	0.42	4.01	11.36
GREEN SF X HYBRID					6	5.00	0.68	0.05	0.44	9.17
BLACKSIDE DARTER	D	I	S		13	10.83	1.48	0.05	0.46	4.38
JOHNNY DARTER	D	I	C		48	40.00	5.45	0.04	0.38	0.97
FANTAIL DARTER	D	I	C		21	17.50	2.39	0.04	0.35	2.05
	Mile Total				880	733.33		10.40		
	Number of Species				22					
	Number of Hybrids				1					

Species List

River Code: **05-320** River Mile: **1.00**	Stream: **Carroll Ditch** Basin: Sandusky River Time Fished: 1750 sec Drain Area: 7.2 sq mi Dist Fished: 0.19 km No of Passes: 1	Sample Date: **1995** Date Range: 10/11/95 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
GRASS PICKEREL		P	M	P	6	9.47	1.39			
WHITE SUCKER	W	O	S	T	3	4.74	0.69			
REDFIN SHINER	N	I	N		12	18.95	2.78			
BLUNTNOSE MINNOW	N	O	C	T	306	483.16	70.83			
YELLOW BULLHEAD		I	C	T	11	17.37	2.55			
BLACK BULLHEAD		I	C	P	3	4.74	0.69			
BL'KSTRIPE TOPMINNOW		I	M		70	110.53	16.20			
LARGEMOUTH BASS	F	C	C		1	1.58	0.23			
GREEN SUNFISH	S	I	C	T	15	23.68	3.47			
JOHNNY DARTER	D	I	C		5	7.90	1.16			
	Mile Total				432	682.11				
	Number of Species				10					
	Number of Hybrids				0					

River Code: **05-321** River Mile: **1.40**	Stream: **Enoch Creek** Basin: Sandusky River Time Fished: 5188 sec Drain Area: 7.7 sq mi Dist Fished: 0.30 km No of Passes: 2	Sample Date: **1995** Date Range: 07/31/95 Thru: 10/11/95 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
WHITE SUCKER	W	O	S	T	55	55.00	3.38			
CREEK CHUB	N	G	N	T	394	394.00	24.25			
SILVERJAW MINNOW	N	I	M		2	2.00	0.12			
FATHEAD MINNOW	N	O	C	T	1	1.00	0.06			
BLUNTNOSE MINNOW	N	O	C	T	98	98.00	6.03			
CENTRAL STONEROLLER	N	H	N		1,030	1,030.00	63.38			
GREEN SUNFISH	S	I	C	T	10	10.00	0.62			
JOHNNY DARTER	D	I	C		34	34.00	2.09			
FANTAIL DARTER	D	I	C		1	1.00	0.06			
	Mile Total				1,625	1,625.00				
	Number of Species				9					
	Number of Hybrids				0					

Species List

River Code: **05-322** River Mile: **6.20**	Stream: **Prairie Run** Basin: Sandusky River Time Fished: Drain Area: 2.4 sq mi Dist Fished: 0.15 km No of Passes: 1	Sample Date: **1995** Date Range: 08/01/95 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
GRASS PICKEREL		P	M	P	2	4.00	2.90			
WHITE SUCKER	W	O	S	T	11	22.00	15.94			
COMMON CARP	G	O	M	T	4	8.00	5.80			
GOLDEN SHINER	N	I	M	T	12	24.00	17.39			
CREEK CHUB	N	G	N	T	4	8.00	5.80			
REDFIN SHINER	N	I	N		1	2.00	1.45			
FATHEAD MINNOW	N	O	C	T	8	16.00	11.59			
BLUNTNOSE MINNOW	N	O	C	T	2	4.00	2.90			
YELLOW BULLHEAD		I	C	T	6	12.00	8.70			
BL'KSTRIPE TOPMINNOW		I	M		6	12.00	8.70			
GREEN SUNFISH	S	I	C	T	6	12.00	8.70			
BLUEGILL SUNFISH	S	I	C	P	7	14.00	10.14			
	Mile Total				69	138.00				
	Number of Species				12					
	Number of Hybrids				0					

Species List

River Code: **05-322** River Mile: **1.10**	Stream: **Prairie Run** Basin: Sandusky River Time Fished: 4890 sec Drain Area: 7.9 sq mi Dist Fished: 0.38 km No of Passes: 2	Sample Date: **1995** Date Range: 08/16/95 Thru: 10/11/95 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
GRASS PICKEREL		P	M	P	7	5.53	2.17			
WHITE SUCKER	W	O	S	T	53	41.84	16.41			
GOLDEN SHINER	N	I	M	T	7	5.53	2.17			
CREEK CHUB	N	G	N	T	75	59.21	23.22			
BLUNTNOSE MINNOW	N	O	C	T	71	56.05	21.98			
CENTRAL STONEROLLER	N	H	N		26	20.53	8.05			
YELLOW BULLHEAD		I	C	T	7	5.53	2.17			
BL'KSTRIPE TOPMINNOW		I	M		1	0.79	0.31			
GREEN SUNFISH	S	I	C	T	39	30.79	12.07			
BLUEGILL SUNFISH	S	I	C	P	7	5.53	2.17			
BLACKSIDE DARTER	D	I	S		1	0.79	0.31			
JOHNNY DARTER	D	I	C		29	22.89	8.98			
	Mile Total				323	255.00				
	Number of Species				12					
	Number of Hybrids				0					

River Code: **05-323** River Mile: **1.70**	Stream: **Thompson Ditch** Basin: Sandusky River Time Fished: 1772 sec Drain Area: 2.2 sq mi Dist Fished: 0.14 km No of Passes: 1	Sample Date: **1995** Date Range: 10/12/95 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
CREEK CHUB	N	G	N	T	7	15.00	24.14			
FATHEAD MINNOW	N	O	C	T	13	27.86	44.83			
BLUNTNOSE MINNOW	N	O	C	T	2	4.29	6.90			
CENTRAL STONEROLLER	N	H	N		1	2.14	3.45			
BL'KSTRIPE TOPMINNOW		I	M		2	4.29	6.90			
GREEN SUNFISH	S	I	C	T	1	2.14	3.45			
JOHNNY DARTER	D	I	C		3	6.43	10.35			
	Mile Total				29	62.14				
	Number of Species				7					
	Number of Hybrids				0					

River Code: **05-324** River Mile: **1.40**	Stream: **Blood Run** Basin: Sandusky River Time Fished: 4080 sec Drain Area: 3.7 sq mi Dist Fished: 0.32 km No of Passes: 2	Sample Date: **1995** Date Range: 08/04/95 Thru: 10/10/95 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
WHITE SUCKER	W	O	S	T	70	65.63	24.39			
CREEK CHUB	N	G	N	T	208	195.00	72.47			
FATHEAD MINNOW	N	O	C	T	1	0.94	0.35			
CENTRAL STONEROLLER	N	H	N		8	7.50	2.79			
Mile Total					287	269.06				
Number of Species					4					
Number of Hybrids					0					