State of Ohio
Environmental Protection Agency

Division of Surface Water

Biological and Water Quality Study of Ohio Brush Creek and Selected Tributaries 2007

Watershed Assessment Units 05090201 03, 04, and 05.

Adams, Highland, Brown, and Pike Counties

OHIO EPA Technical Report EAS/2010-7-10

February 14, 2011

John Kasich, **Governor**
Mary Taylor, **Lt. Governor**
Scott J. Nally, **Director**

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NOTICE TO USERS

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (Ohio Administrative Code [OAC] 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 (OAC 3745-1-07, Table 7-15). 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., Ecol. Assess. Sect., 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.

Ohio Environmental Protection Agency. 2008a. 2008 Updates to Biological criteria for the protection of aquatic life: Volume II and Volume II Addendum. Users manual for biological field assessment of Ohio surface waters. Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

Ohio Environmental Protection Agency. 2008b. 2008 Updates to Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

Ohio Environmental Protection Agency. 2006a. Methods for assessing habitat in flowing waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Tech. Bull. EAS/2006-06-1. Revised by the Midwest Biodiversity Institute for Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

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.

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Copies of this report are located on the Ohio EPA internet web page (http://www.epa.ohio.gov/dsw/document_index/psdindx.aspx) or may be available on CD from:

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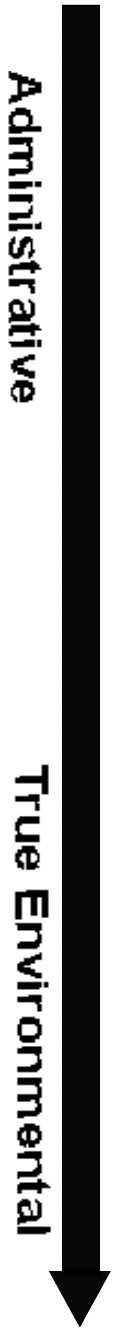
FOREWORD

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 4-5 watersheds study areas with an aggregate total of 350-400 sampling sites.

The 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], Water Quality Permit Support Documents [WQPSDs]), and are eventually incorporated into the biennial Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]) and Total Maximum Daily Load (TMDL) reports developed to address identified pollutants impairing Ohio waterbodies.

Hierarchy of Indicators
A carefully conceived ambient monitoring approach, using cost-effective indicators consisting 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 includes a hierarchical continuum from administrative to true environmental indicators (Figure A). 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,



LEVEL 1	Actions by EPA and States	NPDES Permit Issuance Compliance/Enforcement Pretreatment Program Actual Funding CSO Requirements Storm Water Permits 319 NPS Projects 404/401 Certification Stream/Riparian Protection
LEVEL 2	Responses by the Regulated Communitiy	POTW Construction Local Limits Storm Water Controls BMPs for NPS Control Pollution Prevention Measures
LEVEL 3	Changes in Discharge Quantities	Point Source Loadings - Effluent & Influent Whole Effluent Toxicity (WET) NPDES Violations Toxic Release Inventory Spills & Other Releases Fish Kills
LEVEL 4	Changes in Ambient Conditions	Water Column Chemistry Sediment Chemistry Habitat Quality Flow Regime
LEVEL 5	Changes in Uptake and/or Assimilation	Assimilative Capacity - TMDL/WLA Biomarkers Tissue Contamination
LEVEL 6	Changes in Health and Ecology, or Other Effects	Biota (Biocriteria) Bacterial Contamination Target Assemblages (RT&E, Declining Species)

Figure A. Hierarchy of administrative and environmental indicators which can be used for water quality management activities such as monitoring and assessment, reporting, and the evaluation of overall program effectiveness. This is patterned after a model developed by the U.S. EPA.

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 recreation 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 Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]), the Ohio Nonpoint Source Assessment, and other technical bulletins.

Ohio Water Quality Standards: Designated Aquatic Life Use

The Ohio Water Quality Standards (OAC 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 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) *Cold-water 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 can be having a water depth of at least one meter over an area of at least 100 square feet or, lacking this, where frequent human contact is a reasonable expectation. If a water body does not meet either criterion, the SCR use applies. The attainment status of PCR and SCR is determined using bacterial indicators (*e.g.,* fecal coliform, *E. coli)* and the criteria for each are specified in the Ohio WQS.

Attainment of recreation uses are evaluated based on monitored bacteria levels. The Ohio Water Quality Standards state that all waters should be free from any public health nuisance associated with raw or poorly treated sewage (Administrative Code 3745-1-04, Part F). Additional criteria (Administrative Code 3745-1-07) apply to waters that are designated as suitable for full body contact such as swimming (PCR- primary contact recreation) or for partial body contact such as wading (SCR- secondary contact recreation). These standards were developed to protect human health, because even though fecal coliform bacteria are relatively harmless in most cases, their presence indicates that the water has been contaminated with fecal matter.

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 AWS and 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.

Mechanisms for Water Quality Impairment

The following paragraphs describe the various causes of impairment that were encountered during the Olentangy River and Whetstone Creek study. While these perturbations are presented under separate headings, it is important to remember that they are often interrelated and cumulative in terms of the detrimental impact that can result.

Habitat and Flow Alterations
Habitat alteration, such as channelization, negatively impacts biological communities by limiting the complexity of living spaces available to aquatic organisms. Consequently, fish and macroinvertebrate communities are not as diverse. Indirect impacts include

agricultural activities such as the removal of trees and shrubs adjacent to streams (described throughout this report as riparian vegetation) and field tiling to facilitate drainage. Urbanization impacts include removal of riparian trees, influx of stormwater run off, straightening and piping of stream channels, and riparian vegetation removal. Following a rain event, most of the water is quickly removed from tiled fields or urban settings rather than filtering through the soil, recharging groundwater, and reaching the stream at a lower volume and more sustained rate. As a result, small streams more frequently go dry or become intermittent.

Tree shade is important because it limits the energy input from the sun, moderates water temperature, and limits evaporation. Removal of the tree canopy further degrades conditions because it eliminates an important source of coarse organic matter essential for a balanced ecosystem. Riparian vegetation aids in nutrient uptake, may decrease run-off rate into streams, and helps keep soil in place. Erosion impacts channelized streams more severely due to the lack of a riparian buffer to slow runoff, trap sediment and stabilize banks. Deep trapezoidal channels lack a functioning flood plain and therefore cannot expel sediment as would occur during flood events along natural watercourses. Additionally, the confinement of flow within an artificially deep channel accelerates the movement of water downstream, exacerbating flooding of neighboring properties.

The lack of water movement under low flow conditions can exacerbate degradation from organic loading and nutrient enrichment by limiting reaeration of the stream. The amount of oxygen soluble in water decreases as temperature increases. This is one reason why tree shade is so important. The two main sources of oxygen in water are diffusion from the atmosphere and plant photosynthesis. Turbulence at the water surface is critical because it increases surface area and promotes diffusion, but channelization eliminates turbulence produced by riffles, meanders, and debris snags. Plant photosynthesis produces oxygen, but at night, respiration reverses the process and consumes oxygen. Conversely, oxygen concentrations can become supersaturated during the day, due to abnormally high amounts of photosynthesis, causing gas bubble stress to both fish and invertebrate communities. Oxygen is also used by bacteria that consume dead organic matter. Nutrient enrichment promotes the growth of nuisance algae that subsequently dies and serves as food for bacteria. Under these conditions, oxygen can be depleted unless it is replenished from the air.

Siltation and Sedimentation

Whenever the natural flow regime is altered to facilitate drainage, increased amounts of sediment are likely to enter streams either by overland transport or increased bank erosion. The removal of wooded riparian areas furthers the erosional process. Channelization keeps all but the highest flow events confined within the artificially high banks. As a result, areas that were formerly flood plains and facilitated the removal of sediment from the primary stream channel no longer serve this function. As water levels fall following a rain event, interstitial spaces between larger rocks fill with sand and silt and the diversity of available habitat to support fish and macroinvertebrates is reduced. Silt also can clog the gills of both

fish and macroinvertebrates, reduce visibility thereby excluding obligate site feeding fish species, and smother the nests of lithophilic fishes. Lithophilic spawning fish require clean substrates with interstitial voids in which to deposit eggs. Conversely, pioneering species benefit. They are generalists and best suited for exploiting disturbed and less heterogeneous habitats. The net result is a lower diversity of aquatic species compared with a typical warmwater stream with natural habitats.

Sediment also impacts water quality, recreation, and drinking water. Nutrients adsorbed to soil particles remain trapped in the watercourse. Likewise, bacteria, pathogens, and pesticides which also attach to suspended or bedload sediments become concentrated in waterways where the channel is functionally isolated from the landscape.

Nutrient Enrichment

The element of greatest concern is phosphorus because it is critical for plant growth and is often the limiting nutrient. The form that can be readily used by plants and therefore can stimulate nuisance algae blooms is orthophosphate (PO_4^{3-}). The amount of phosphorus tied up in the nucleic acids of food and waste is actually quite low. This organic material is eventually converted to orthophosphate by bacteria. The amount of orthophosphate contained in synthetic detergents is a great concern however. It was for this reason that the General Assembly of the State of Ohio enacted a law in 1990 to limit phosphorus content in household laundry detergents sold in the Lake Erie drainage basin to 0.5 % by weight. Inputs of phosphorus originate from both point and nonpoint sources. Most of the phosphorus discharged by point sources is soluble. Another characteristic of point sources is they have a continuous impact and are human in origin, for instance, effluents from municipal sewage treatment plants. The contribution from failed on-site wastewater treatment systems can also be significant, especially if they are concentrated in a small area. The phosphorus concentration in raw waste water is generally 8-10 mg/l and after secondary treatment is generally 4-6 mg/l. Further removal requires the added cost of chemical addition. The most common methods use the addition of lime or alum to form a precipitate, so most phosphorus (80%) ends up in the sludge.

A characteristic of phosphorus discharged by nonpoint sources is that the impact is intermittent and is most often associated with stormwater runoff. Most of this phosphorus is bound tightly to soil particles and enters streams from erosion, although some comes from tile drainage. Phosphorus input from urban stormwater is more of a concern if combined sewer overflows are involved. Phosphorus loading from rural stormwater varies depending on land use and management practices and includes contributions from livestock feedlots and pastures and row crop agriculture. Crop fertilizer includes granular inorganic types and organic types such as manure or sewage sludge. Pasture land is especially a concern if the livestock have access to the stream. Large feedlots with manure storage lagoons create the potential for overflows and accidental spills. Land management is an issue because erosion is worse on streams without any riparian buffer zone to trap runoff. The impact is worse in streams that are channelized because they no longer have a functioning flood plain and cannot expel sediment during flooding. Oxygen levels must also be

considered, because phosphorus is released from sediment at higher rates under anoxic conditions.

There is no numerical phosphorus criterion established in the Ohio Water Quality Standards, but there is a narrative criterion that states phosphorus should be limited to the extent necessary to prevent nuisance growths of algae and weeds (Administrative Code, 3745-1-04, Part E). Phosphorus loadings from large volume point source dischargers in the Lake Erie drainage basin are regulated by the National Pollutant Discharge Elimination System (NPDES). The permit limit is a concentration of 1.0 mg/l in final effluent. Research conducted by the Ohio EPA indicates that a significant correlation exists between phosphorus and the health of aquatic communities (Miltner and Rankin, 1998). It was concluded that biological community performance in headwater and wadeable streams was highest where phosphorus concentrations were lowest. It was also determined that the lowest phosphorus concentrations were associated with the highest quality habitats, supporting the notion that habitat is a critical component of stream function. The report recommends WWH criteria of 0.08 mg/l in headwater streams (<20 mi^2 watershed size), 0.10 mg/l in wadeable streams (>20-200 mi^2) and 0.17 mg/l in small rivers (>200-1000 mi^2).

Organic Enrichment and Low Dissolved Oxygen

The amount of oxygen soluble in water is low and it decreases as temperature increases. This is one reason why tree shade is so important. The two main sources of oxygen in water are diffusion from the atmosphere and plant photosynthesis. Turbulence at the water surface is critical because it increases surface area and promotes diffusion. Drainage practices such as channelization eliminate turbulence produced by riffles, meanders, and debris snags. Although plant photosynthesis produces oxygen by day, it is consumed by the reverse process of respiration at night. Oxygen is also consumed by bacteria that decay organic matter, so it can be easily depleted unless it is replenished from the air. Sources of organic matter include poorly treated waste water, livestock waste, sewage bypasses, and dead plants and algae. Dissolved oxygen criteria are established in the Ohio Water Quality Standards to protect aquatic life. The minimum and average limits are tiered values and linked to use designations (Administrative Code 3745-1-07, Table 7-1).

Ammonia

Ammonia enters streams as a component of fertilizer and manure run-off and wastewater effluent. Ammonia gas (NH_3) readily dissolves in water to form the compound ammonium hydroxide (NH_4OH). In aquatic ecosystems an equilibrium is established as ammonia shifts from a gas to undissociated ammonium hydroxide to the dissociated ammonium ion (NH_4^{+1}). Under normal conditions (neutral pH 7 and 25°C) almost none of the total ammonia is present as gas, only 0.55% is present as ammonium hydroxide, and the rest is ammonium ion. Alkaline pH shifts the equation toward gaseous ammonia production, so the amount of ammonium hydroxide increases. This is important because while the ammonium ion is almost harmless to aquatic life, ammonium hydroxide is very toxic and can reduce growth and reproduction or cause mortality.

The concentration of ammonia in raw sewage is high, sometimes as much as 20-30 mg/l. Treatment to remove ammonia involves gaseous stripping to the atmosphere, biological nitrification and de-nitrification, and assimilation into plant and animal biomass. The nitrification process requires a long detention time and aerobic conditions like that provided in extended aeration wastewater treatment plants. Under these conditions, bacteria first convert ammonia to nitrite and then to nitrate. Nitrate can then be reduced by bacteria through the de-nitrification process and nitrogen gas and carbon dioxide are produced as by-products.

Ammonia criteria are established in the Ohio Water Quality Standards to protect aquatic life. The maximum and average limits are tiered values based on sample pH and temperature and linked to use designations (Administrative Code 3745-1-07, Tables 7-2 through 7-8).

Metals

Metals can be toxic to aquatic life and hazardous to human health. Although they are naturally occurring elements many are extensively used in manufacturing and are by-products of human activity. Certain metals like copper and zinc are essential in the human diet, but excessive levels are usually detrimental. Lead and mercury are of particular concern because they often trigger fish consumption advisories. Mercury is used in the production of chlorine gas and caustic soda and in the manufacture of batteries and fluorescent light bulbs. In the environment it forms inorganic salts, but bacteria convert these to methyl-mercury and this organic form builds up in the tissues of fish. Extended exposure can damage the brain, kidneys, and the developing fetus. The Ohio Department of Health (ODH) issued a statewide fish consumption advisory in 1997 advising women of child bearing age and children six and under not to eat more than one meal per week of any species of fish from waters of the state because of mercury. Lead is used in batteries, pipes, and paints and is emitted from burning fossil fuels. It affects the central nervous system and damages the kidneys and reproductive system. Copper is mined extensively and used to manufacture wire, sheet metal, and pipes. Ingesting large amounts can cause liver and kidney damage. Zinc is a by-product of mining, steel production, and coal burning and used in alloys such as brass and bronze. Ingesting large amounts can cause stomach cramps, nausea, and vomiting.

Metals criteria are established in the Ohio Water Quality Standards to protect human health, wildlife, and aquatic life. Three levels of aquatic life standards are established (Administrative Code 3745-1-07, Table 7-1) and limits for some elements are based on water hardness (Administrative Code 3745-1-07, Table 7-9). Human health and wildlife standards are linked to either the Lake Erie (Administrative Code 3745-1-33, Table 33-2) or Ohio River (Administrative Code 3745-1-34, Table 34-1) drainage basins. The drainage basins also have limits for additional elements not established elsewhere that are identified as Tier I and Tier II values.

Bacteria

High concentrations of either fecal coliform bacteria or *Escherichia coli* (*E. coli*) in a lake or stream may indicate contamination with human pathogens. People can be exposed to contaminated water while wading, swimming, and fishing. Fecal coliform bacteria are relatively harmless in most cases, but their presence indicates that the water has been contaminated with feces from a warm-blooded animal. Although intestinal organisms eventually die off outside the body, some will remain virulent for a period of time and may infect humans. This is especially a problem if the feces contained pathogens or disease producing bacteria and viruses. Reactions to exposure can range from an isolated illness such as skin rash, sore throat, or ear infection to a more serious wide spread epidemic. Some types of bacteria that are a concern include *Escherichia*, which cause diarrhea and urinary tract infections, *Salmonella*, which cause typhoid fever and gastroenteritis (food poisoning), and *Shigella*, which cause severe gastroenteritis or bacterial dysentery. Potential waterborne viruses that are a concern include polio, hepatitis A, and encephalitis. Disease causing parasitic microorganisms such as cryptosporidium and giardia are also a concern.

Since fecal coliform bacteria are associated with warm-blooded animals, there are both human and animal sources. Human sources, including effluent from sewage treatment plants or discharges by on-lot wastewater treatment systems, are a more continuous problem. Bacterial contamination from combined sewer overflows are associated with wet weather events. Animal sources are usually more intermittent and are also associated with rainfall, except when domestic livestock have access to the water. Large livestock farms store manure in holding lagoons and this creates the potential for an accidental spill. Liquid manure applied as fertilizer is a runoff problem if not managed properly as it may seep into field tiles or travel overland during precipitation events.

Bacteria criteria for the recreational use are established in the Ohio Water Quality Standards to protect human health. The maximum and average limits are tiered values and linked to use designation, but only apply during the May 1-October 15 recreation season (Administrative Code 3745-1-07, Table 7-13). The standards also state that streams must be free of any public health nuisance associated with raw or poorly treated sewage during dry weather conditions (Administrative Code 3745-1-04, Part F).

Sediment Contamination

Chemical quality of sediment is a concern because many pollutants bind strongly to soil particles and are persistent in the environment. Some of these compounds accumulate in the aquatic food chain and trigger fish consumption advisories, but others are simply a contact hazard because they can cause skin irritation, skin cancer and tumors. The physical and chemical nature of sediment is determined by local geology, land use, and contribution from manmade sources. As some materials enter the water column they are attracted to the surface electrical charges associated with suspended silt and clay particles. Others simply sink to the bottom due to their high specific gravity. Sediment layers form as suspended particles settle, accumulate, and combine with other organic and inorganic

materials. Sediment is the most physically, chemically, and biologically reactive at the water interface because this is where it is affected by sunlight, current, wave action, and benthic organisms. Assessment of the chemical nature of this layer can be used to predict ecological impact.

Sediment chemistry results are evaluated by Ohio EPA using a dual approach, first by ranking relative concentrations based on a system developed by Ohio EPA (1996) and then by determining the potential for toxicity based on guidelines developed by MacDonald et al (2000). The Ohio EPA system was derived from samples collected at ecoregional reference sites. Classes are grouped in ranges that are based on the median analytical value (non-elevated) plus 1 (slightly elevated), 2 (elevated), 4 (highly elevated), and 8 (extremely elevated) inter-quartile values. The MacDonald guidelines are consensus based using previously developed values. The system predicts that sediments below the threshold effect concentration (TEC) are absent of toxicity and those greater than the probable effect concentration (PEC) are toxic.

Sediment samples collected by the Ohio EPA are measured for a number of physical and chemical properties. Physical attributes included % particle size distribution (sand ≥60 μ, silt 5-59 μ, clay ≤4 μ), % solids, and % organic carbon. Due to the dynamics of flowing water, most natural streams in Central Ohio do not contain a lot of fine grained sediment and samples often consist mostly of sand. Fine grained sediments are deposited in flood plains of natural streams during periods of high flow. This scenario changes if the stream is impounded by a dam or channelized. Chemical attributes included metals, volatile and semi-volatile organic compounds, pesticides, and poly-chlorinated biphenyls (PCBs).

Biological and Water Quality Study of Ohio Brush Creek and Principal Tributaries

Adams, Highland, Brown, and Pike Counties

INTRODUCTION

As part of the Total Maximum Daily Load (TMDL) process, an intensive ambient assessment of the Ohio Brush Creek watershed was conducted by the Ohio EPA during the 2007 field sampling season. The study area included the entire length of the Ohio Brush Creek, principal tributaries, and all remaining minor conveyances possessing a drainage area greater than 3 mile^2. A total of 57 stations were sampled throughout the catchment, evaluating 27 named and unnamed streams. Ambient biology, macrohabitat quality, water column chemistry, and bacterial data were gathered from all locations. Diel water quality (DO, pH, conductivity, and temperature), and sediment chemistry (metals, organics, and particle size) were evaluated at selected stations. Cumulatively, 152 linear stream miles of the watershed were surveyed and assessed.

A station list was derived from a systematic census of the watershed, based upon drainage area. This method has proved rapid and efficient in generating an objective and comprehensive collection of potential sampling sites where an assessment of an entire catchment is desired. However, an unavoidable consequence of this method includes substantial data gaps in lower or larger stream segments. It was therefore necessary to directly target these higher order segments (or tributaries) to ensure an even distribution of sampling effort. Ohio EPA sampling resources were also allocated to evaluate public and private NPDES permitted entities. Lastly, areas that have been previously sampled and evaluated by the Ohio EPA were revisited for the purposes of trends assessment.

Specific sampling objectives included the following:

1) Systematically sample and assess the principal drainage network of Ohio Brush Creek in support of the TMDL process,

2) Gather ambient environmental information (biological, chemical, and physical) from undesignated water bodies to objectively prescribe an appropriate suite of beneficial uses (e.g., aquatic life, recreation, water supply),

3) Verify the appropriateness of existing and unverified beneficial use designations, and recommend changes were appropriate,

4) Establish baseline ambient biological conditions at selected reference stations to evaluate the effectiveness of existing and future pollution abatement efforts,

5) Evaluate WWTPs and other NPDES permitted entities within the study area, and

6) Document any changes in the biological, chemical, and physical conditions of the study areas where historical information exists, thus expanding the Ohio EPA data base for statewide trends analysis.

Components of the TMDL process supported by this survey are principally the identification of impaired waters, verification (and redesignation if necessary) of beneficial use designations, gathering ambient information that will factor into the wasteload allocation, ascribing causes and sources of use impairment, and the derivation of basin specific pollutant loading goals or restoration targets. These data are necessary precursors to the development of effective pollution control or abatement strategies.

The reporting structure for the results contained within this executive summary takes three basic forms: 1) Cumulative statistics for all waters surveyed and assessed as part of the 2007 Ohio Brush Creek study area, 2) Linear, longitudinal or other spatial evaluations of selected named streams, and 3) Hydrologic Unit (HUC) summaries. These reporting structures serves multiple and important purposes. Cumulative catchment statistics provide a concise and efficient way to summarize status, condition, and principal causes and sources of use impairment for the entire study area. The consolidation of water resource data into discrete hydrologic units (HUCs) has become the standard national reporting format. For the sake of State, regional and national continuity and comparability, Ohio EPA adapted this model in 2000. Furthermore, the HUC based approach to water resource inventory has as its basic unit, the sub-watersheds. Collectively, these sub-units comprise the catchments for all major drainages in the State. These descrete units serve as logical geographical areas in which to consolidate environmental data. However, an equally important consideration is the ease at which the results of State sponsored water resources surveys are communicated to the various publics with direct or indirect interest in the status and condition of waters of the State. Outside of resource specialists, aggregated statistics regarding the status of surface waters lack the specificity anticipated by the many of publics served by Ohio EPA. End users of these consolidated data (entire watershed or HUC) find it difficult to quickly extract information regarding a specific water body in which they may have a particular interest. Named linear wetted channels, namely brooks, streams and rivers exist not only in the in the landscape but also in the mind of the public. Therefore, to encourage interest in and conservation of all waters of the state, and to ensure that data gathered through public sponsored water surveys, where possible, practical, and appropriate, are informative, discrete named rivers, streams, or stream segments are treated narratively within summaries provided below.

SUMMARY

Of the 152 aggregate linear stream miles of the Ohio Brush Creek watershed assessed in 2007, 91.1 miles (59.9%) were found to fully support existing and recommended aquatic life uses. Partial attainment was indicated for 57.8 miles (38.1%) and non-attainment for the remaining 3.1miles (2.0%). Total impaired miles, a combination of both partial and non-attainment, was 60.9, representing 40.1% of the study area. These impairments were identified in 14 streams (or segments) of the 27 waterbodies surveyed in 2007. A list of waters assessed as part of this survey, performance of community and habitat indices, by station or reach, and aquatic life attainment status for the Ohio Brush Creek watershed are presented in Table 1 and Figure 1.

By far the leading associated cause and source of the aquatic life use impairments throughout the basin was the significant reduction, diminution and at times elimination of surface flow, due to an extreme drought experienced throughout south-central Ohio in 2007 (Ohio DNR 2007). At the commencement of field sampling efforts in June, the USGS gage located on Ohio Brush Creek, 13.15 miles from the mouth, marked the discharge of only10 cfs, well below the range of historical median flows (50 to 100 cfs) for that period. Similar conditions persisted through July, and by August a significant and precipitous decline in daily discharge began. This trend continued into September, where flow fell below the 7Q10 (lowest seven-consecutive-day average flow expected to occur once every ten years) of 0.3 cfs. The last week of September saw the lowest discharge on record for Ohio Brush Creek, as the mainstem was reduced to an anemic 0.12 cfs. A flow hydrograph for Ohio Brush Creek during this period, as well as historical median discharge, and other relevant statistics is presented in Figure 2. Based upon direct observations made by the principal field investigators for this study, the objective measures and descriptions of the flow regime of the mainstem provided above were paralleled, almost without exception, throughout the watershed. By early summer, most tributaries lacked continuous surface flow. Moreover, by late summer even the larger order streams, including some segments of the lower mainstem, were desiccated and reduced to large pools separated by dry streambed.

Fully 98.4% of the impaired stream miles had as their primary cause and source of impairment low flow (cause), resulting from a prolonged regional drought (source). Although other stressors were identified for many waterbodies, nearly all of these factors had, as their antecedent, diminished surface flow due to an exceptionally dry summer. The effects of natural background pollutant loads as well as those from land use activities (largely livestock production) and minor WWTPs within the basin, safely assimilated in most years, were in many instances amplified by the lack of adequate dilution and assimilation. As a result, these causes and sources were identified as being attendant to the drought, and thus considered secondary or tertiary in nature, respecting their influence upon water resource quality throughout the basin. These leading secondary and tertiary causes included low DO, elevated BOD, elevated ammonia, and elevated nutrients, and were coincidental to drought affected waters at about twenty percent of the miles identified as impaired. As the leading source of the water quality problems identified in 2007 was a severe regional drought, few other significant sources were identified. Livestock production

Table 1. Aquatic life use attainment status for the Ohio Brush Creek basin, June-September, 2007.

River Mile Fish/Invert.	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Cause(s)	Source(s)
Ohio Brush Creek (10-200)							
			Interior Plateau (IP) - EWH Aquatic Life Use (Existing)				
54.7^{H}/54.7	56	NA	G*	67.0	PARTIAL	Low Flow	Natural: Drought Related Impacts
52.5^{W}/52.5	53	9.6	VG^{ns}	73.0	FULL		
47.2^{W}/47.16	51	9.2^{ns}	E	57.0	FULL		
44.9^{W}/44.9	55	9.8	MG*	66.5	PARTIAL	Low Flow	Natural: Drought Related Impacts
40.4^{W}/39.0	51	9.8	E	74.5	FULL		
30.4^{W}/30.4	58	10.4	E	79.5	FULL		
24.8^{W}/24.8	53	9.5	44^{ns}	81.0	FULL		
21.4^{W}/21.35	57	10.4	E	84.5	FULL		
15.2^{W}/15.2	51	10.4	E	79.5	FULL		
10.4^{W}/10.0	54	10.0	44^{ns}	83.0	FULL		
			Interior Plateau (IP) - WWH Aquatic Life Use (Existing)				
6.0^{B}/6.0	49	9.8	E	77.5	FULL		
0.5^{B}/0.5	37	8.2	12	58.0	FULL		*Note: Ohio River Backwater. Biocriteria do not apply.
Lost Fork (10-237)							
			Interior Plateau (IP) - WWH Aquatic Life Use (Verified)				
2.5^{H}/2.5	52	NA	F*	49.5	PARTIAL	Low Flow, Low DO	Natural: Drought Related Impacts
1.7^{H}/1.7	54	NA	G	59.0	FULL		
Elk Run (10-234)							
			Interior Plateau (IP) - WWH Aquatic Life Use (Verified)				
1.4^{H}/1.5	52	NA	E	60.5	FULL		
0.8^{H}/0.9	50	NA	G	51.0	FULL		

Table 1. continued.

River Mile Fish/Invert.	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Cause(s)	Source(s)
Elm Run (10-233)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
1.75^{H}/0.6	50	NA	F*	50.5	PARTIAL	Low Flow, Low DO	Natural: Drought Related Impacts
Baker Fork (10-240)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
14.7^{H}/14.8	50	NA	MG^{ns}	50.5	FULL		
Interior Plateau (IP) - WWH/EWH Aquatic Life Use (Existing/Recommended)							
10.5^{W}/10.5	54	9.6	48	71.0	FULL		
1.5^{W}/1.49	57	10.6	E	73.5	FULL		
Middle Fork Baker Fork (10-241)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
5.4^{H}/5.4	58	NA	VG	69.5	FULL		
0.3^{W}/0.3	57	9.5	G	64.0	FULL		
Strait Creek (10-245)							
Interior Plateau (IP) - WWH/EWH Aquatic Life Use (Existing/Recommended)							
0.8^{H}/0.6	58	NA	E	69.0	FULL		
Muddy Fork (10-246)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
0.4^{H}/0.39	50	NA	F*	58.0	PARTIAL	Habitat Alteration, Low DO, and Siltation	Channelization *Note: Owing to the unique geology of its headwaters, the Baker Fork basin showed sustained discharge through the drought of 2007.
Crooked Creek (10-218)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
2.2^{H}/2.2	52	NA	F*	67.5	PARTIAL	Low Flow, Low DO	Natural: Drought Related Impacts *Note: Dst. Locust Grove WWTP

Table 1. continued

River Mile Fish/Invert.	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Cause(s)	Source(s)
Little East Fork (10-216)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
0.9[H]/0.9	50	NA	F*	68.0	PARTIAL	Low Flow	Natural: Drought Related Impacts
0.4[H]/0.4	52	NA	F*	57.5	PARTIAL	Low Flow	Natural: Drought Related Impacts
Shimer Run (10-248)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
0.1[H]/0.1	54	NA	G	76.5	FULL		*Note: Dst. Peebles WWTP
West Fork Ohio Brush Creek (10-220)							
Interior Plateau (IP) - EWH/WWH Aquatic Life Use (Existing/Recommended)							
20.5[H]/20.53	46	NA	P*	48.5	NON	Low Flow, Low DO, BOD, and Ammonia	Natural: Drought Related Impacts
17.9[H]/17.92	42	NA	F*	79.0	PARTIAL	Low Flow, Low DO, BOD, and Ammonia	Natural: Drought Related Impacts
15.2[W]/15.2	49	9.7	G	61.0	FULL		
Interior Plateau (IP) - EWH Aquatic Life Use (Verified)							
12.7[W]/12.74	55	9.6	G*	64.5	PARTIAL	Low Flow, Low DO, BOD	Natural: Drought related impacts
10.5[W]/10.5	52	10.0	G*	65.5	PARTIAL	Low Flow, Low DO, BOD	Natural: Drought related impacts
6.1[W]/6.1	52	9.5	MG*	67.0	PARTIAL	Low Flow	Natural: Drought related impacts *Note: Dst. Seaman WWTP
1.1[W]/1.1	55	9.9	G*	70.5	PARTIAL	Low Flow	Natural: Drought related impacts
Elk Fork (10-230)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
1.6[H]/1.61	46	NA	F*	68.5	PARTIAL	Low Flow, Low DO, Ammonia, BOD, Nutrient Enrichment (variable DO regime and elevated TKN)	Natural: Drought Related Impacts Livestock: Unrestricted cattle Minor source: Winchester WWTP

Table 1. continued.

River Mile Fish/Invert.	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Cause(s)	Source(s)
Little West Fork (10-229)							
			Interior Plateau (IP) - WWH Aquatic Life Use (Verified)				
6.3^{H}/6.26	30*	NA	F*	56.5	NON	Low Flow, Low DO, Ammonia, (Elevated TKN), and Siltation	Natural: Drought related impacts Livestock: Unrestricted cattle access (immediately upstream)
5.7^{H}/5.7	48	NA	F*	57.5	PARTIAL	Low Flow, Low DO, Ammonia, and Nutrient Enrichment (elevated TKN)	Natural: Drought Related Impacts Livestock: Unrestricted cattle access
0.1^{W}/0.1	48	8.8	F*	53.5	PARTIAL	Low Flow, BOD	Natural: Drought Related Impacts Livestock: Unrestricted cattle access
Buck Run (10-228)							
			Interior Plateau (IP) - WWH Aquatic Life Use (Verified)				
0.4^{H}/0.38	46	NA	MG^{ns}	63.0	FULL		
Cherry Fork (10-224)							
			Interior Plateau (IP) - WWH Aquatic Life Use (Verified)				
8.7^{H}/8.74	46	NA	LF*	51.5	PARTIAL	Low Flow, Low DO, Ammonia, Total Phosphorus, Organic Enrichment (elevated BOD, elevated TKN), and Siltation	Natural: Drought Related Impacts On-site Treatment: Septic drainage Livestock: Unrestricted cattle
7.5^{H}/7.5	50	NA	F*	52.5	PARTIAL	Low Flow, Siltation, and Nutrient Enrichment (very high DO)	Natural: Drought Related Impacts Ust. Sources (septic drainage) Livestock: Unrestricted cattle
2.6^{W}/2.61	40	9.0	F*	51.5	PARTIAL	Low Flow, Ammonia, Nutrient Enrichment (variable DO regime, with high and low values), and Siltation	Natural: Drought Related Impacts Livestock: Unrestricted cattle

Table 1. continued.

River Mile Fish/Invert.	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Cause(s)	Source(s)
Grace Run (10-225)							
			Interior Plateau (IP) - WWH Aquatic Life Use (Verified)				
1.3[H]/1.4	42	NA	F*	31.5	PARTIAL	Low Flow, Siltation, Ammonia, BOD, Nutrient Enrichment (elevated TKN and variable DO regime)	Natural: Drought Related Impacts Livestock: Unrestricted cattle
Georges Creek (10-222)							
			Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)				
3.2[H]/3.8	38[ns]	NA	F*	58.0	PARTIAL	Low Flow, Ammonia, BOD, and Oil and Grease	Natural: Drought Related Impacts Livestock: Unrestricted cattle Spill: Source Unknown
0.1[H]/0.1	54	NA	F*	71.5	PARTIAL	Low Flow	Natural: Drought Related Impacts
Lick Fork (10-211)							
			Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)				
4.3[H]/4.3	42	NA	F*	63.0	PARTIAL	Low Flow	Natural: Drought Related Impacts
0.7[H]/1.03	58	8.7	G	72.0	FULL		
Trebor Run (10-212)							
			Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)				
0.1[H]/0.1	50	NA	MG[ns]	59.5	FULL		
Cave Run (10-213)							
			Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)				
0.1[H]/0.1	42	NA	G	59.0	FULL		

Table 1. continued.

River Mile Fish/Invert.	IBI	MIwb[a]	ICI[b]	QHEI	Attainment Status	Cause(s)	Source(s)
UN Lick Fork Trib. at RM 4.02 (10-215) [AKA Louiso Tributary]							
EWH/WWH Aquatic Life Use (Existing/Recommended)							
							Natural: Drought Related Impacts
0.2[H]	46	NA	F*	56.5	PARTIAL	Low Flow, Low DO	*Note: Toxic conditions ust. related to livestock, and amplified by drought (extremely low DO, extremely elevated Ammonia), but no evidence of cattle influence at RM 0.2.
Cedar Run (10-209)							
Interior Plateau (IP) - EWH Aquatic Life Use (Verified)							
0.4[H]/0.38	56	NA	E	74.0	FULL		
Beasley Fork (10-205)							
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)							
4.7[H]/4.7	52	NA	MG[ns]	66.0	FULL		
3.2[H]/3.2	54	NA	G	60.0	FULL		
0.8[H]/0.75	52	NA	G	81.5	FULL		
UN Beasley Fork Trib. at RM 4.6 (10-252)							
Interior Plateau (IP) – WWH Aquatic Life Use (Recommended) [Unlisted]							
0.2[H]/0.17	46	NA	MG[ns]	61.0	FULL		
Moores Run (10-206)							
Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)							
0.2[H]/0.4	50	NA	MG[ns]	52.5	FULL		

a - Ohio River backwaters, biocriteria do not apply.
b - ICI score or narrative equivalent derived from qualitative assessment (E-exceptional, VG-very good, G-good, MG-marginally good, F-fair, LF-low fair, P-Poor).
H - Headwaters: sites draining areas $\leq$ 20 miles^2.
W - Wadable streams: sites draining areas > 20 miles^2.
B - Boat sites (large waters).
ns - Non-significant departure from the biocriteria ($\leq$4 IBI and ICI units or $\leq$0.5 MIwb units).
* - Significant departure from the biocriteria (>4 IBI and ICI units or >0.5 MIwb units).

Table 1. continued.

Ecoregional Criteria (OAC 3745-1-07, Table 7-15)

Interior Plateau (IP) Ecoregion

Index-Site Type	WWH	EWH	MWH[d]
IBI- Headwater/Wading	40	50	24
MIwb-Wading	8.1	9.4	6.2
IBI-Boat	38	48	24
MIwb-Boat	8.5	9.6	5.8
ICI	30	46	22

d – Modified Warmwater Habitat (MWH) for channel modified or impounded areas.

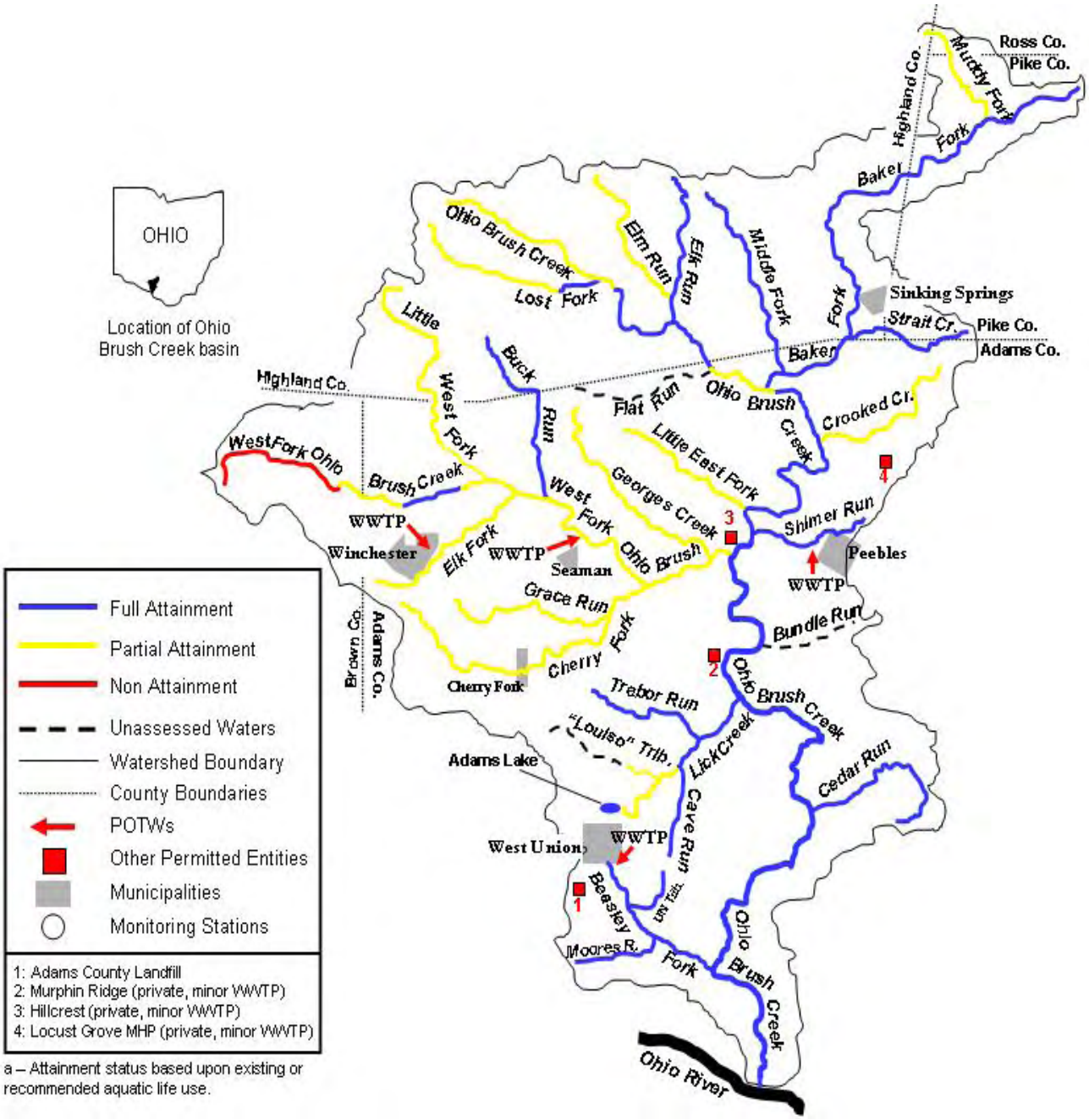


Figure 1. Map of surface waters of the Ohio Brush Creek basin, color coded to attainment status of existing and recommended aquatic life use designation, 2007.

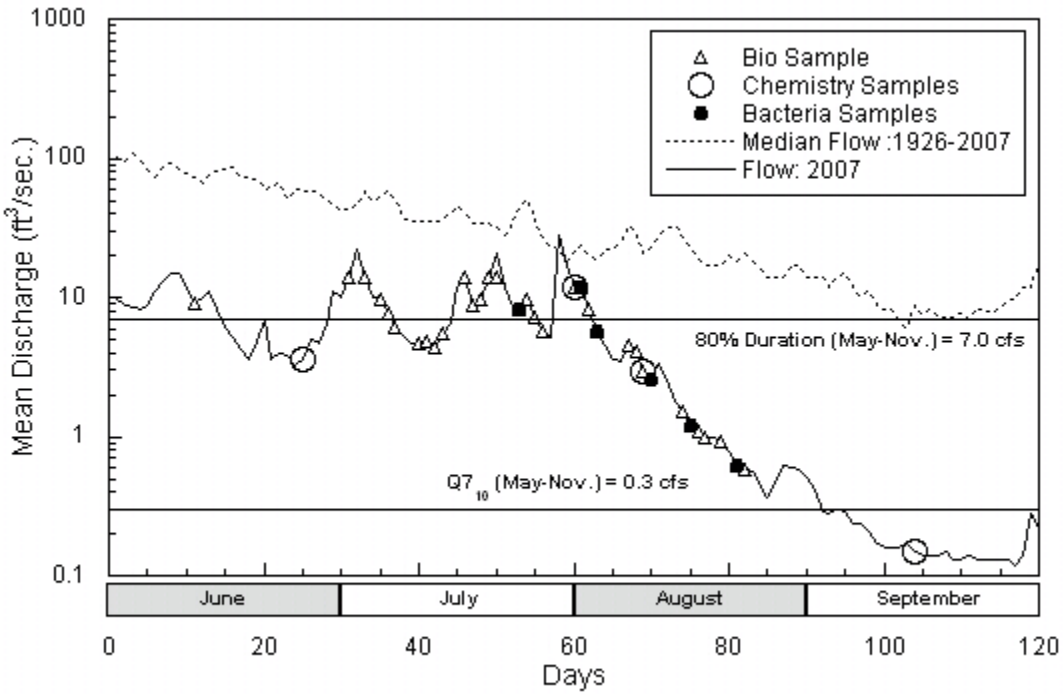


Figure 2. Flow hydrograph for Ohio Brush Creek (RM 13.15) showing 2007 daily mean discharge and historical median discharge, 1926-2007 (USGS 2007). Symbols indicate days of Ohio EPA sampling visits by environmental indicator.

was considered a contributing source at just over twenty percent of impaired miles, but its ultimate in-stream effects (nutrients, ammonia, BOD, and sedimentation), must be viewed in light of diminished or absent surface flow at nearly all impaired locations. The remaining sources of impairment were very minor in nature and highly localized, and shall be detailed within the HUC summaries within this report.

By contemporary standards it is uncommon to find such a high percentage of impaired river miles within a rural and relatively undeveloped watershed, as that observed for Ohio Brush Creek in 2007. However, there are several characteristics, biotic and abiotic, operating on both temporal and spatial scales that help explain the present status. The first and most significant is that the joint biological assessment provided by the use of fish and macroinvertebrate assemblages yielded, in many instances, strongly divergent results. Specifically, and almost without exception, fish community performance throughout the basin was found fully consistent with existing or recommended aquatic life designations. In fact, taken together, typical fish community performance achieved a narrative evaluation of exceptional, as the basin yielded cumulative average IBI and MIwb scores of 50 and 9.6, respectively. The vast majority of fish stations were found to support a diverse and well organized assemblage of fish, showing high species richness, a good representation of

sensitive taxa and very low incidence of disease or other anomalies associated with degraded water quality. In contrast, the performance of the macrobenthos at the same locations, typically performed, narratively, no better than fair, and in almost every instance were the organism group controlling attainment of the prescribed biocriteria.

The reasons for this strong divergence are complex, but principally related to the manner in which the macrobenthos responded to the temporal stress associated with the prolonged drought. Additional important variables included the diverse and contrasting physiography found within the basin and the interrelationships between these various land forms and stream discharge. As a result, the proximate and ultimate effects of drought were manifest differently across spatial scales within the watershed. Despite diminished surface flow observed at nearly all sites, pools of adequate depth were present through each stream reach sampled. These provided ample refuge for the resident fish assemblages as drought settled into the watershed. Most of these pools appeared influenced by or at time directly connected to the water table, and thus maintained a stable and moderate thermal regime. Undoubtedly, many where kept clean and free from septic conditions through the influence of ground water or hyporheic flow, or both. The excellent performance of the fish communities, despite the general dewatering of the basin, is a result of a common behavior of many fish species inhabiting drought prone regions or river systems draining and coursing through highly permeable geology, namely, migration to deep pools during times of low flow. The abundance of high quality pool habitat throughout the basin and the adaptive behaviors of the resident fish assemblages were clearly evidenced in 2007, and serves as an adequate explanation for the maintenance of high quality fish communities at nearly every sampling station.

In contrast, the effects of the basin-wide drought upon the performance of the macroinvertebrates were multifaceted. The first of these drought effects was the suspension of the standard methods of assessment commonly employed by Ohio EPA. For waters possessing a drainage area greater than 20 miles^2, the macroinvertebrate fauna are typically sampled and assessed through the deployment, colonization, and retrieval of artificial substrates (Ohio EPA 1987c). However, a necessary condition for the use of this type of sampling methodology is that a minimum current velocity must be maintained over the artificial substrates to ensure the potential for adequate colonization. Of the 21 stations within the 2007 study area slated for this type of sampling, only three sites, evaluating two streams (Ohio Brush Creek at RMs 24.8 and 10.4 and Baker Fork at RM 10.5) were found to have adequate flow over the six week colonization period, thus yielding the basin's only valid ICI scores. All other attempts to set or retrieve valid artificial substrates failed due to inadequate stream discharge at the time of the set, or if adequate velocity was initially observed, subcritical discharge developed over the colonization period and thus, the resulting community index scores were invalidated due to slow current velocity. Because of this, samples collected by hand from available natural substrates (qualitative methods) were the primary data source for the evaluation of the condition of the macrobenthos. The qualitative evaluation (direct collection from natural substrates) has proved a useful and

important surrogate, where, due to any number of externalities (e.g., low current, vandalism, flooding, etc.), quantified data are unavailable. The reliance upon the qualitative method for Ohio Brush Creek poses no significant technical problems, as narratives assessments have proved to correlate well to ICI scores statewide. However, the use of qualitative data on such a large scale and for a watershed draining well over 400 miles^2 is uncommon, and clearly indicates the scale and magnitude of the drought.

Of greater ecological significance, and thus of greater relevance to the appraisal of the environmental conditions of Ohio Brush Creek, is the direct response of the macrobenthos to the prolonged drought observed in 2007. In general, resident macroinvertebrates (aquatic larval forms) show a great sensitivity to flow related variables. In the context of environmental monitoring and assessment, this sensitivity extends well beyond the choice of sampling protocols. Aside from aerial dispersal by breeding adults, significant movement and distribution of various larval macroinvertebrates is accomplished through stream drift. In the absence of strong and continuous flow, the ability of the macrobenthos to migrate or move any great distance in order avoid stress or carry out other important aspects of life history is curtailed. It is also important to consider that many invertebrate taxa occupy specific niches, and are thus closely associated with specific macro- and micro-habitats. The diversity, frequency, density, and functional integrity of these environs are, in many instances, dependent upon regular and sustained flow. The significant diminution of surface flow, as observed throughout Ohio Brush Creek, greatly simplified available aquatic habitats, thus temporally reducing once complex riverine environments to fairly monotonous pool and pool margin habitat. Lastly, the amplification of the negative effects of background pollutant loads associated with drought conditions add to the complexity. Although measures of chemical water quality did not portray pervasive degradation within the basin, reduced DO, elevated demand parameters, and elevated concentrations of ammonia-N and nutrients were observed, singularly or in combination, for approximately 20% of impaired miles, and appeared well correlated with decreasing flow. Confined to smaller areas and of marginal quality, macroinvertebrates can be subjected to greater inter- and intra-taxa competition, predation, and other density dependant factors. A common responses to the conditions described above for many macroinvertebrate taxa includes migration to the the hyporheic zone, accelerated emergence as adults, and diapauses (Lytle and Poff 2004; Harper and Peckarsk 2006). It is this suite of stressors: loss of preferred habitat, limited movement and avoidance, density dependent stress and mortality, and increased chemical and physical stress, that collectively affected the macroinvertebrate community throughout much the Ohio Brush Creek basin in 2007.

Effects of both drought and native drainage patterns that gave rise to the stream desiccation and its attendant effects upon the macroinvertebrate community (described above) were not evenly distributed throughout the Ohio Brush Creek watershed. Instead, stream ephemerality and associated aquatic life use impairment were concentrated in the glaciated (Illinoian age) uplands that form the northwestern portion of the basin. In contrast, and almost without exception, adequate water and thus generally intact macroinvertebrate faunas were found throughout the unglaciated regions of the basin (Figures 3 and 4).

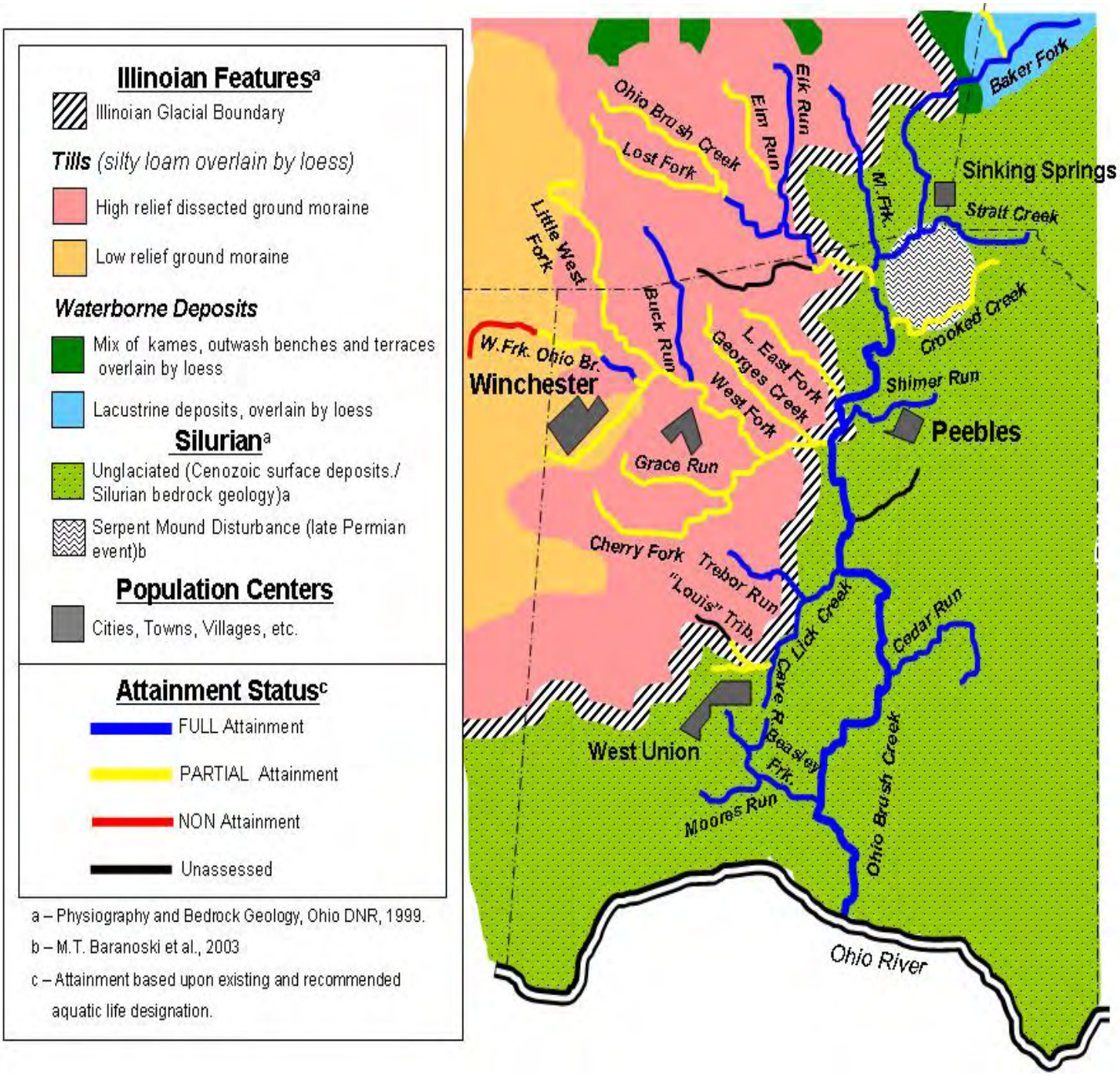


Figure 3. Stream trace, color coded to aquatic life use attainment status, projected over physiographic regions and sub-regions of the Ohio Brush Creek study area, 2007. Note: concentration of impaired waters (Non and Partial attainment) contained within the glaciated portion of the basin.

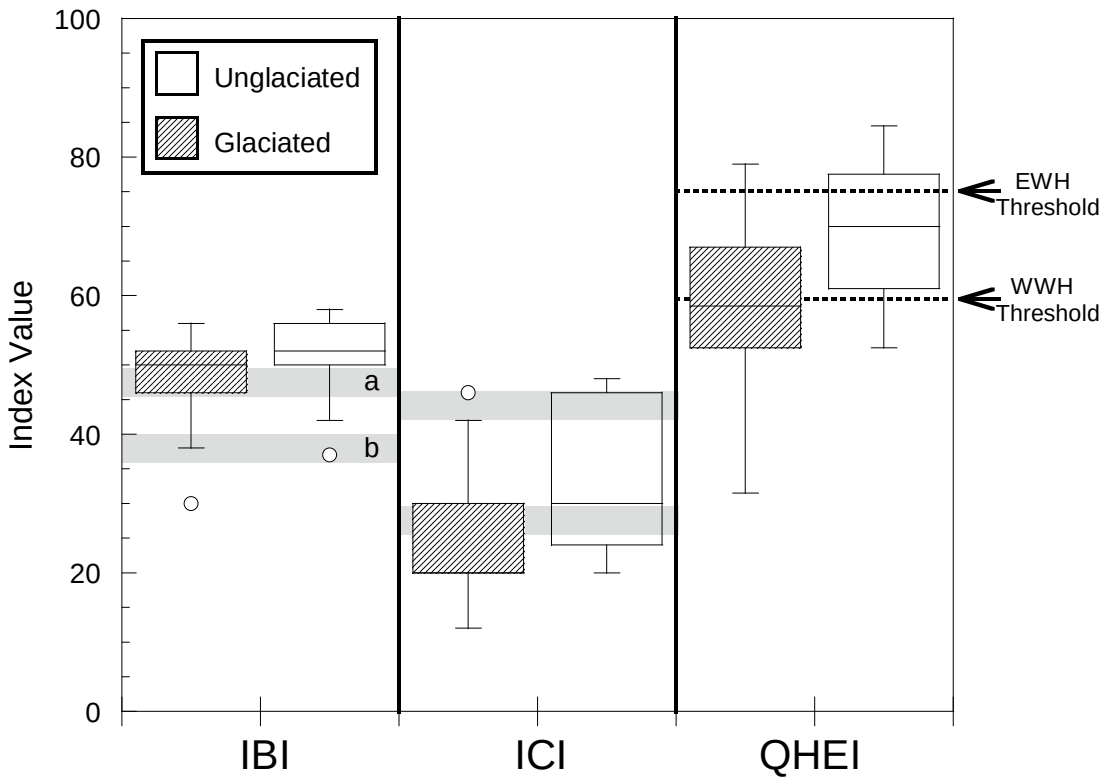


Figure 4. Aggregate performance of three key indicies for waters draining glaciated (Illinoian age) and unglaciated regions contained within the Ohio Brush Creek study area, 2007. Shaded areas ***a*** and ***b*** represent the EWH and WWH biocriteria and area of non-significant departure, respectively, for the IBI (fish community index) and ICI (benthic macroinvertebrate community index). Note overall higher performance of all measures through unglaciated areas and comparatively depressed performance of the ICI for glaciated areas.

Departure from the spatial pattern of drought affected impaired waters was indicated at two stations evaluating two streams: Ohio Brush Creek mainstem (RM 47.2) and Crooked Creek (RM 2.2). As both waterbodies are within the unglaciated area of the catchment, flow related impairment appeared at first inexplicable. However, upon further investigation, it became apparent that both the segment of the mainstem and nearly the entire length of Crooked Creek were adjacent to or in close proximity with the Serpent Mound Disturbance. It was recently verified that this unique geological feature is an ancient meteor impact zone (Baramoski et al. 2003). Among its many distinct features are deep fissures, some approaching 3000 ft. in depth. Perhaps a portion of surface and subsurface flow of Crooked Creek and the above mentioned segment of the mainstem are entrained into deep fissures associated with the disturbance. This relationship is speculative, but not with out historical support, as the Village of Sinking Springs, located near the northern boundary of the impact zone, is named in honor of the very phenomenon (Cottingham 1949).

Alternatively, surface flows from these two areas may have been captured by and entrained to unrelated karst or pseudo-karst features common to the region (Pavey et al. 2002). Like the flow impaired stations in Ohio Brush and Crooked Creeks, the lower reaches of Baker Fork are also within or near the meteor disturbance area. However, potential negative influences associated with the altered flow regime may have been tempered, offset or otherwise mitigated by an abundance of sustained groundwater flow from the headwaters that drains water bearing, glacial and lacustrine deposits.

Drought and its various and sundry effects within the basin were superceded as the primary cause of impairment for one stream within the Ohio Brush Creek basin: Muddy Fork. Located in the northwest quadrant of the basin, Muddy Fork is a direct tributary to Baker Fork. Both Muddy Fork and upper Baker Fork drain a unique subregion within the basin, consisting of a mix of waterborne deposits (kames, outwash terraces, and lacustrine sediments), and thus maintained relatively stable discharge through the drought of 2007. Given the nature of these deposits, particularly the dominance of poorly drained lacustrine features, Muddy Fork has been directly channelized. In general, artificial reconfiguration of the channel initiates a cascade of negative effects, disrupting the natural flow regime, increasing local gradient, modification of existing sediment dynamics, and generally simplifying near and in-stream macrohabitats. The range of associated physical changes to channel form and function can give rise to a dimunition of chemical water quality. Aquatic life use impairment on Muddy Fork was attributed primarily to degraded physical habitat.

The results from fecal bacteria sampling found that the Ohio Brush Creek mainstem fully met the criteria for the applicable Class A or Class B Primary Contact Recreation use. Elsewhere in the basin, locations not attaining the existing or recommended recreation use were most likely affected by failing home septic treatment system (HSTS) discharges and/or waste from livestock with free access to the creeks. Bacteria colonies were most likely present in high numbers because of the rural nature of the watershed with few centralized sanitary sewer systems. Bacterial contamination may have also resulted from agricultural activities such as pasture land runoff and manure land application. Drought conditions during 2007 may have also contributed to high bacteria numbers because low flows may have concentrated bacteria counts in pools where samples were collected. Additional bacteria samples were collected at twelve locations in 2008 and only one location failed to meet the applicable Class A (existing for Ohio Brush Creek mainstem and W. Fk. Ohio Brush Creek) or Class B (existing or recommended for all others) Primary Contact Recreation use criteria.

Trends Summary

Multiple data sets were available to assess ambient biological performance in the Ohio Brush Creek watershed through time. In one form or another, Ohio Brush Creek has been regularly assessed by Ohio EPA since 1984. Prior field work has included all or portions of the mainstem and selected tributaries, supporting various water quality management goals (e.g.,NPDES, stream regionalization, use attainability analysis, and reference site monitoring). The first significant attempt to evaluate the entire basin was undertaken in 1987, where the majority of the mainstem and major tributaries were systematically

sampled (Ohio EPA 1989a). Other field efforts, both large and small, were undertaken in 1997, and 2001. The 2007 survey results represent the most comprehensive effort to date, extending sampling coverage well beyond all previous efforts, both in terms of spatial coverage and station density.

As indicated by the condition of the resident aquatic biology, environmental conditions of surface waters that constitute the Ohio Brush Creek catchment have, in a fundamental way, remained stable through time. Comparison with previous assessments, basin-wide efforts or limited studies, show that relatively minor aquatic life use impairments associated with some of the WWTPs on the mainstem or selected tributaries, first identified in the mid-1980s have been, in most instances, successfully abated.

Excluding the minor exceptions indicated above, the fish community sampling through all field years has consistently yielded results within the good to exceptional range and almost without exception was found to comport with the prescribed biocriteria. The only significant and widespread variation through the period of record was manifest within the benthic macroinvertebrate fauna. Individual streams, reaches, segments or even collections of waterbodies draining a particular sub-region within the study area yielded, at times, significantly different results between field years. This variation was not related principally to any anthropogenic stress, rather the performance of the macrobenthos from many waters, through time, appeared directly related to annual or seasonal flow regime. However, flow mediated variation of macrobenthos performance was not universal, rather, it was limited to waters draining less than 150 miles^2 and almost without exception streams within the glaciated regions of the study area. Both the 1987 and 2007 surveys were undertaken during periods of severe drought (Ohio DNR 1987 and 2007). As a result, water coursing through glacial lands and of modest drainage area, common to both the 1987 and 2007 sampling efforts, typically supported similarly depressed invertebrate faunas. However, common stations, reaches or stream segments sampled during the intervening years (1997 and 2001) found the macrobenthos significantly improved; the operative variable being stream discharge, as both 1997 and 2001 were typical years for Ohio Brush Creek (USGS 1997 and 2001).

Watershed Assesment Units

Headwaters Ohio Brush Creek (05090201 03)

The Headwaters Ohio Brush Creek watershed assessment unit (WAU) is defined as the portion of the catchment beginning at the upper limits of the manistem, extending to just downstream from the Baker Fork confluence, and all areas drained by this segment. It includes a 13.8 mile segment of Ohio Brush Creek and seven direct and indirect tributaries. In total, 16 sampling stations were deployed throughout the sub-basin evaluating a total of 43.8 linear stream miles. Assessed waters included upper Ohio Brush Creek, Lost Fork, Elk Run, Elm Run, Baker Fork, Middle Fork Baker Fork, Strait Creek and Muddy Fork. Full attainment of existing and recommended aquatic life uses was indicated for 11 sites (68.8%). The remaining 5 sites (31.2%) were found impaired, partially meeting the prescribed biocriteria. Significant or otherwise compelling aquatic use impairment (non-attainment) was not observed in the Headwaters Ohio Brush Creek WAU.

By far the leading source of use impairment was the prolonged and severe drought and its associated effects (e.g., desiccation and depressed DO regime). Streams or stream segments so affected included two reaches of the mainstem (RMs 54.7 and 44.9), upper Lost Fork and Elm Run. Only Muddy Fork, a Baker Fork tributary, was negatively impacted by factors above and beyond those related to drought. Habitat modification in the form of direct channelization and associated sedimentation appeared the principal operative stressors for Muddy Fork. It is important to note that the impairments identified above were indicated in the benthic macroinvertebrate community alone. Fish community performance at all stations included within the Headwaters Ohio Brush Creek WAU was found fully consistent with the prescribed biocriteria. Attainment statistics and leading causes and sources of aquatic life use impairment for the WAU are presented in Table 2**.**

Table 2. Aquatic life use attainment statistics and leading causes and sources of use impairment for the Headwaters Ohio Brush Creek watershed assessment unit.

HUC 05090201 03: Headwaters Ohio Brush Creek				
Waterbodies	**Sites Assessed**	**Sites Full**	**Sites Partial**	**Sites NON**
Ohio Brush Creek (G-T)	4	2 (50.0%)	2 (50.0%)	0
Lost Fork (G)	2	1 (50.0%)	1 (50.0%)	0
Elk Run (G)	2	2 (100.0%)	0	0
Elm Run (G)	1	0	1 (100%)	0
Baker Fork (G-UG)	3	3 (100.0%)	0	0
Middle Frk Baker Fork (G-U)	2	2 (100.0%)	0	0
Strait Creek (U)	1	1 (100.0%)	0	0
Muddy Fork (U)	1	0	1 (100%)	0
Total Sites	**16**	**11 (68.8%)**	**5 (31.2%)**	**0**

Causes of Aquatic Life Use Impairment*	**Sources of Aquatic Life Use Impairment***
Low Flow (80.0%)	Natural-Drought (80.0%)
Low DO (60.0%)	Channelization (20.0%)
Habitat Alteration (20.0%)	
Siltation (20.0%)	

G – Waterbodies draining glaciated (Illinoian age) portion of the basin. In comparison with unglaciated areas of the watershed, glacial lands are subject to greater land use intensity, primarily livestock, and streams draining the landscape appeared prone to ephermeral flow. The vast majority of impairment documented in 2007 was contained within glaciated portions of the watershed.

UG – Waterbodies draining the unglaciated portion of the basin. Streams so identified generally showed perennial surface flow, higher quality macrohabitat and typically supported aquatic assemblages consistent with existing or recommended aquatic life use.

T– Waterbodies sampled though the transitional zone between glaciated uplands and the unglaciated lowlands.

*As multiple causes and sources of impairment may be indicated for the same waterbody or stream location, percentages following each cause and source are derived from the number of impaired sites so affected.

West Fork Ohio Brush Creek (05090201 04)

The West Fork Ohio Brush Creek WAU is defined as the entire area drained by this important Ohio Brush Creek tributary. It includes the entire 21 mile length of the West Fork itself and six direct and indirect tributaries. In total, 18 sampling stations were located throughout the sub-basin evaluating a total of 46 linear stream miles. Assessed waters included the West Fork, Elk Fork, Little West Fork, Buck Run, Cherry Fork, Grace Run and Georges Creek. Full attainment of existing and recommended aquatic life uses was indicated for only two sites (11.1%). The remaining 16 sites were found impaired, with 14 sites (77.8%) in partial attainment and two sites (11.1%) failing to meet all prescribed biocriteria. Attainment statistics and leading causes and sources of aquatic life use impairment for the WAU are presented in Table 3**.**

With nearly 90% of the watershed impaired, the West Fork sub-basin stands as the most degraded within the entire Ohio Brush Creek study area. Drought and its attendant effects were the principal cause and source of use impairment. Almost without exception, all other cause are considered secondary and tertiary in nature, their negative effects realized as a result of severe drought conditions.

Table 3. Aquatic life use attainment statistics and leading causes and sources of use impairment for the West Fork Ohio Brush Creek watershed assessment unit.

HUC 05090201 04: West Fork Ohio Brush Creek				
Waterbodies	**Sites Assessed**	**Sites Full**	**Sites Partial**	**Sites NON**
West Fork Ohio Br Creek (G)	7	1 (14.3%)	5 (71.4%)	1 (14.3%)
Elk Fork (G)	1	0	1 (100.0%)	0
Little West Fork (G)	3	0	2 (66.7%)	1 (33.3%)
Buck Run (G)	1	1 (100.0%)	0	0
Cherry Fork (G)	3	0	3 (100.0%)	0
Grace Run(G)	1	0	1 (100.0%)	0
Georges Creek (G)	2	0	2 (100.0%)	0
Total Sites	**18**	**2 (11.1%)**	**14 (77.8%)**	**2 (11.1%)**

Causes of Aquatic Life Use Impairment*	**Sources of Aquatic Life Use Impairment***
Low Flow (100.0%)	Natural-Drought (100.0%)
Ammonia-N (56.3%)	Livestock (56.3%)
Low DO (50.0%)	Unknown Spill (6.3%)
Elevated BOD (50.0%)	Minor WWTP (6.3%)
Nutrients (37.5%)	On-site Septic System (12.5%)
Siltation (31.3%)	
Oil/Grease (6.3%)	
Organic Enrichment (6.3%)	

G – Waterbodies draining glaciated (Illinoian age) portion of the basin. In comparison with unglaciated areas of the watershed, glacial lands are subject to greater land use intensity, primarily livestock, and streams within this subregion appeared prone to ephemeral flow. The vast majority of impairment documented in 2007 was contained within glaciated portions of the watershed.

UG – Waterbodies draining the unglaciated portion of the basin. Streams so identified generally showed perennial surface flow, higher quality macrohabitat and typically supported aquatic assemblages consistent with existing or recommended aquatic life use.

T– Waterbodies sampled though the transitional zone between glaciated uplands and the unglaciated lowlands.

*As multiple causes and sources of impairment may be indicated for the same waterbody or stream location, percentages following each cause and source are derived from the number of impaired sites so affected.

Lick Fork - Ohio Brush Creek (05030201 05)

The Lick Fork-Ohio Brush Creek WAU is defined as the mainstem segment beginning immediately downstream from the Baker Fork confluence to the Ohio River, and all areas drained by this segment. It includes a 41.2 mile segment of Ohio Brush Creek and 11 direct and indirect tributaries. In total, 23 sampling stations were deployed throughout the sub-basin evaluating a total of 62.2 linear stream miles. Assessed waters included lower Ohio Brush Creek, Crooked Creek, Little East Fork, Shimer Run, Lick Fork, Trebor Run, Cave Run, Cedar Run, Beasley Fork, Moores Run, and two unnamed tributaries. Full attainment of existing and recommended aquatic life uses was indicated for 18 sites (78.3%). The remaining five sites (21.7%) were found impaired, partially meeting the prescribed biocriteria. Significant or otherwise compelling aquatic use impairment (non-attainment) was not observed in the Lick Fork-Ohio Brush Creek WAU. Attainment statistics and leading causes and sources of aquatic life use impairment for the WAU are presented in Table 4**.**

Table 4. Aquatic life use attainment statistics and leading causes and sources of use impairment for the Lick Fork-Ohio Brush Creek watershed assessment unit.

HUC 05090201 05: Lick Fork-Ohio Brush Creek				
Waterbodies	**Sites Assessed**	**Sites Full**	**Sites Partial**	**Sites NON**
Ohio Brush Creek (UG)	8	8 (100.0%)	0	0
Crooked Creek (UG)	1	0	1 (100.0%)	0
Little East Fork (G)	2	0	2 (100.0%)	0
Shimer Run (UG)	1	1 (100.0%)	0	0
Lick Fork (UG)	2	1 (50.0%)	1 (50.0%)	0
Trebor Run (T)	1	1 (100.0%)	0	0
Cave Run (UG)	1	1 (100.0%)	0	0
Louiso Trib (T)	1	0	1 (100.0%)	0
Cedar Run (UG)	1	1 (100.0%)	0	0
Beasley Fork (UG)	3	3 (100.0%)	0	0
UN Beasley Frk Trib (UG)	1	1 (100.0%)	0	0
Moores Run (UG)	1	1 (100.0%)	0	0
Total Sites	**23**	**18 (78.3%)**	**5 (21.7%)**	**0**

Causes of Aquatic Life Use Impairment*	**Sources of Aquatic Life Use Impairment***
Low Flow (100.0%)	Natural-Drought (100.0%)
Low DO (40.0%)	

G – Waterbodies draining glaciated (Illinoian age) portion of the basin. In comparison with unglaciated areas of the watershed, glacial lands are subject to greater land use intensity, primarily livestock, and streams draining the landscape appeared prone to ephemeral flow. The vast majority of impairment documented in 2007 was contained within glaciated portions of the watershed.

UG – Waterbodies draining the unglaciated portion of the basin. Streams so identified generally showed perennial surface flow, higher quality macrohabitat and typically supported aquatic assemblages consistent with existing or recommended aquatic life use.

T– Waterbodies sampled though the transitional zone between glaciated uplands and the unglaciated lowlands.

*As multiple causes and sources of impairment may be indicated for the same waterbody or stream location, percentages following each cause and source are derived from the number of impaired sites so affected.

RECOMMENDATIONS

Status of Aquatic Life Uses

Nearly all waterbdies contained within the Ohio Brush Creek watershed were originally designated for aquatic life use(s) in the 1978 and 1985 state water quality standards. The techniques in use at that time did not include standardized approaches to the collection of in-stream biological data or numeric biocriteria. This study represents the first comprehensive use of these types of ambient biological data to inform the use designation process. While some of the recommendations may appear to constitute “downgrades” (i.e., EWH to WWH) or “upgrades” (i.e., WWH to EWH) any change should not be construed as such because these, in most instances, constitute the first application of an objective and robust data driven process to ascertain the appropriate aquatic life use designation. Ohio EPA is obligated by a 1981 public notice to review and evaluate all aquatic life use designations outside of the WWH use prior to basing any permitting actions on the existing, unverified use designations. Thus, some of the following aquatic life use recommendations constitute a fulfillment of that obligation.

Existing and recommended aquatic life use(s) resulting from the 2007 intensive survey are summarized in Table 5. Justification for redesignation or verification of existing aquatic life uses are presented below (Note: All changes reflected below were included and promulgated in a Water Quality Standards rulemaking in 2009 with an effective date of 10/9/2009.).

Ohio Brush Creek

Community performance was found consistent with the existing suite of aquatic life use designations at the vast majority of monitoring stations. Departures from the prescribed biocriteria were limited to the upper reach and derived solely from the subpar performance of the benthic macroinvertebrate community and were attributed to diminished surface flow and stream desiccation associated with drought conditions. Given the temporal nature of the impact the existing, verified aquatic life uses are affirmed.

- Headwaters to Beasley Fork (RM 6.3), EWH (verified/affirmed)
- All other segments, WWH (verified/affirmed)

Beasley Fork

Reach evaluated was found to support an assemblage of aquatic organisms fully consistent with the existing WWH aquatic life use.

- Entire length, WWH (verified)

Table 5. Existing and recommended Waterbody Use Designations for the Ohio Brush Creek basin. All recommendations based on 2007 monitoring and assessment.

Water Body Segment	Use Designation													Comments
		Aquatic Life Habitat						Water Supply			Recreation			
	SRW	WWH	EWH	MWH	SSH	CWH	LRw	PWS	AWS	IWS	BW	PCR	SCR	
Ohio Brush Creek														
• Headwaters to Beasley Frk. Rd. (RM 6.3)	+		+						+	+		+		Existing
• All other segments	+	+							+	+		+		Ohio River backwater
Beasley Fork		*/+							*/+	*/+		*/+		Verified
Moores Run	*	▲	*						*/+	*/+		*/+		EWH to WWH
UN Beasley Fork Trib. (at RM 4.6)		+							+	+		+		Prev. Unlisted
Cedar Run	*		*/+						*/+	*/+		*/+		Verified
Bundle Run	*		*						*	*		*		Unverified[a]
Lick Creek	*	▲	*						*/+	*/+		*/+		EWH to WWH
Treber Run	*	▲	*						*/+	*/+		*/+		EWH to WWH
Cave Run	*	▲	*						*/+	*/+		*/+		EWH to WWH
Louiso Trib. (at RM 4.02)	*	▲	*						*/+	*/+		*/+		EWH to WWH
West Fork Ohio Brush Creek														
• Headwaters to RM 13.7	*	▲	*						*/+	*/+		*/+		EWH to WWH
• All other segments	*		*/+						*/+	*/+		*/+		Verified
Georges Creek	*	▲	*						*/+	*/+		*/+		EWH to WWH
Cherry Fork		*/+							*/+	*/+		*/+		Verified
Grace Run		*/+							*/+	*/+		*/+		Verified
Buck Run		*/+							*/+	*/+		*/+		Verified
Little West Fork		*/+							*/+	*/+		*/+		Verified
Elk Fork		*/+							*/+	*/+		*/+		Verified
Shimer Run		*/+							*/+	*/+		*/+		Verified

Table 5. continued.

Water Body Segment	Use Designation													Comments
		Aquatic Life Habitat						Water Supply			Recreation			
	SRW	WWH	EWH	MWH	SSH	CWH	LRw	PWS	AWS	IWS	BW	PCR	SCR	
Crooked Creek		*/+							*/+	*/+		*/+		Verified
Baker Fork														
• Headwaters to RM 10.98		*/+							*/+	*/+		*/+		Verified
• All other segments		*	▲						*/+	*/+		*/+		WWH to EWH
Middle Fork Baker Fork		*/+							*/+	*/+		*/+		Verified
Little East Fork		*/+							*/+	*/+		*/+		Verified
Strait Creek		*	▲						*/+	*/+		*/+		WWH to EWH
Muddy Fork		*/+							*/+	*/+		*/+		Verified
Flat Run		*							*	*		*		Unverified[a]
Elk Run		*/+							*/+	*/+		*/+		Verified
Elm Run		*/+							*/+	*/+		*/+		Verified
Lost Fork		*/+							*/+	*/+		*/+		Verified

* -Unverified, existing or recommended Use Designation.

\+ -Verified Use Designation.

▲ -New recommendation and verified Use Designation based on the findings of this report.

*/+ -Verification of an existing yet unverified Use Designation based on the findings of this report.

a -Water bodies so identified were not surveyed or assessed as part of 2007 sampling effort.

Ohio WQS Beneficial Uses

SRW = state resource water.
WWH = warmwater habitat.
EWH = exceptional warmwater habitat.
MWH = modified warmwater habitat.
SSH = seasonal salmonid habitat.
CWH = coldwater habitat.
LRW = limited resource water.
PWS = public water supply.
AWS = agricultural water supply.
IWS = industrial water supply.
BW = bathing water.
PCR = primary contact recreation.

Moores Run
The entire length of Moores Run was originally designated EWH, unverified, as part of the 1978 WQS. The 2007 survey marked the first evaluation of this Ohio Brush Creek tributary. Based upon the survey results, net community performance (attainment status) for Moores Run was well below the EWH criteria. Although drought may have contributed to this, macrohabitat quality as measured by the QHEI, was clearly in the WWH range (QHEI=52.5), and likely served to limit fully exceptional performance.

Given the lack of demonstrated EWH performance (historical or contemporary) and macrohabitat quality well within the WWH range, the more appropriate WWH aquatic life use is recommended.

- EWH (unverified) to WWH (recommended)

Unammed Beasley Fork Tributary at RM 4.6
This unnamed Ohio Brush Creek tributary is presently unlisted. Demonstrated WWH performance by the fish and benthic macroinvertebrate communities indicate the appropriateness of the WWH aquatic life use designation.

- WWH (recommended)

Cedar Run
Reach evaluated was found to support an assemblage of aquatic organisms fully consistent with the existing EWH aquatic life use.

- Entire length, EWH (verified)

Lick Creek
The entire length of Lick Fork was originally designated EWH, unverified, as part of the 1978 WQS. Despite a full field assessment (1980) of this water body prior to the 2007 survey, the existing aquatic life use has remained unverified. Considering both recent and historical data, Lick Fork has never supported a fully exceptional assemblage of aquatic organisms. Net community performance from both the 1980 and 2007 survey results ranged between fair and good, well below the EWH criteria.

Although not paired with fish community sampling, isolated evaluations of the macrobenthos were performed during the intervening field years of 1997 and 2001. Alone these result are not adequate to for a UAA, however, they are important as additional lines of evidence, because the macrobenthos are the controlling indicator group regarding use attainment throughout the entire study area. Macroinvertebrate community performance for 1997 and 2001 ranged between fair and good. These results are both below the EWH criterion and consistent with the 1980 and 2007 macroinvertebrate results. Based upon full assessments (both fish and macroinvertebrates, 1980 and 2007) and partial assessments (macrobenthos alone, 1997 and 2001) the central tendency, and thus the reasonable potential, of Lick Fork is clearly WWH.

Present macrohabitat quality as measured by the QHEI is also consistent with ambient biological performance through time, as the 2007 evaluation yielded a reach QHEI average

of 67.5, with values as low as 63.0. QHEI values within this range are more typical of WWH streams than exceptional waters.

Given the lack of demonstrated EWH performance (historical or contemporary) and macrohabitat quality within the WWH range, the Lick Fork Tributary is recommended to the more appropriate WWH aquatic life use.

- EWH (unverified) to WWH (recommended)

Trebor Run

The entire length of Trebor Run was originally designated EWH, unverified, as part of the 1978 WQS. Despite two full field assessments (1980 and 2001) of this water body prior to the 2007 survey, the existing use has remained unverified. Considering both current and historical data, net community performance (attainment status) was typically below the EWH criteria. One of the three field years (2001) found Trebor Run in full possession of an exceptional aquatic community. The results from the remaining two survey years consistently yielded WWH communities. The central tendency and thus reasonable potential for Trebor Run is clearly WWH. Although, under an ideal flow regime, community performance may advance to exceptional, this is a temporal phenomenon, similar to subpar use performance attributed to severe drought observed at many other locations within the study area. In most years and under a typical flow regime, WWH is the more probable state of Trebor Run. Macrohabitat quality, as measured by the QHEI, is consistent with this conclusion, as Trebor Run yielded a score of 59.5, a value well below that typically associated with EWH, but within the WWH range.

Given the lack of consistent EWH performance (historical and contemporary) and macrohabitat quality well within the WWH range, Trebor Run is recommended to the more appropriate WWH aquatic life use.

- EWH (unverified) to WWH (recommended)

Cave Run

The entire length of Cave Run was originally designated EWH, unverified, as part of the 1978 WQS. Despite three full field assessments (1980, 1997, and 2001) of this water body prior to the 2007 survey, the existing use has remained unverified. Considering both these current and historical data, net community performance (attainment status) was typically below the EWH criteria. In fact, only one of the four field years (2001) found Cave Run in full possession of an exceptional aquatic community. The results from the remaining three survey years consistently yielded WWH communities. The central tendency and thus reasonable potential for Cave Run is clearly WWH. Although, under an ideal flow regime, community performance may advance to exceptional, this is a temporal phenomenon, akin to sub-use performance attributed to severe drought observed at many other locations within the broader study area. In most years and under typical flow regime, WWH is the more probable state of Cave Run. Macrohabitat quality, as measured by the QHEI, is consistent with this conclusion, as Cave Run yielded a score of 59.0, a value well below that typical associated with EWH, but squarely within the WWH range.

Given the lack of consistently demonstrated EWH performance (historical and contemporary) and macrohabitat quality well within the WWH range, Cave Run is recommended to the more appropriate WWH aquatic life use.

- EWH (unverified) to WWH (recommended)

Unnamed Tributary at RM 4.02 (AKA Louiso Trib.)
The entire length of this unnamed Ohio Brush Creek Tributary (AKA Louiso Tributary) was originally designated EWH, unverified, as part of the 1978 WQS. Despite two full field assessments (1980 and 1997) of this water body prior to the 2007 survey, the existing use has remained unverified. Considering both these current and historical data the Louiso Tributary has never supported a fully exceptional assemblage of aquatic organisms. Net community performance between 1980 and 2007 ranged from fair to good, well below the EWH criteria. Present macrohabitat quality as measured by the QHEI is consistent with ambient biological performance through time, as the 2007 evaluation yielded a marginally good score of 56.5.

Given the lack of demonstrated EWH performance (historical or contemporary) and macrohabitat quality within the minimum WWH range, the Louiso Tributary is recommended to the more appropriate WWH aquatic life use.

- EWH (unverified) to WWH (recommended)

West Fork Ohio Brush Creek
The entire length of the West Fork Ohio Brush Creek was originally designated EWH, as part of the 1978 WQS. All seven sampling stations deployed to evaluate this water body in 2007 failed to support an exceptional assemblage of aquatic organisms. However, community performance was not homogenous, as both the worst performing sites and the greatest inter-station variability were observed throughout the upper seven miles. The remaining downstream stations, evaluating approximately 14 stream miles, consistently supported better aquatic communities and showed little inter-station variability. Although drought and attendant water quality problems were identified as the prime cause/source of impairment at all sites, the associated effects appeared more acute through the upper reaches of the West Fork. This observation coupled with the magnitude of departure from the EWH criterion observed in 2007 suggests that the upper third of the West Fork may not be capable of consistently supporting EWH aquatic fauna, even under a normal flow regime, and thus is a candidate for re-designation of the aquatic life use. Drought related impairment, in-and-of itself, does not constitute adequate justification for the re-designation, rather multiple line of evidence were employed to ascertain reasonable potential and assign aquatic life uses accordingly.

1. The existing EWH use for the upper West Fork has never been field verified, as all historical sampling was limited to the lower 13 stream miles. The 2007 survey results marked the first evaluation of the upper segment, and, based upon these findings, net community performance (attainment status) at all stations contained therein was below the EWH criterion. In particular, performance of the macrobenthos, the controlling biological indicator throughout most the Ohio Brush Creek basin, was typically well below even the less stringent WWH criterion.

Although the macrobenthos have a heightened sensitivity to stream desiccation and performance often varies with extreme seasonal changes in flow regime, the magnitude of departure from the EWH biocriteria observed in 2007 through the upper segment appeared greater than that attributable to drought alone. It is doubtful that even under normal flow conditions that the macrobenthos would rebound to an exceptional level of performance.

2. Physiography is also an important consideration in defining reasonable biological potential, and this important landscape variable appeared particularly relevant in explaining biological performance throughout the Ohio Brush Creek watershed. The West Fork catchment is contained entirely within the glaciated Illinoian Tills region of the basin. The negative effects of the 2007 drought appeared exacerbated or otherwise heightened through this area, not only for the West Fork, but for most of the study contained therein. In comparison with the unglaciated portion of Ohio Brush Creek basin, the vast majority of all documented use impairment identified in 2007 was concentrated in the smaller waters coursing through and draining glaciated uplands. Therefore, it appears as though the central tendency of smaller drainages or the upper segment of larger drainages contained within the Illinoian Till plains is ecologically aligned with WWH expectations rather than those for the EWH use.

3. The final consideration for re-designation was based upon the quality of macrohabitat. As measured by the QHEI, the reach average for the segment in question was 62.8, with observed values as low as 48.5. Given this, macrohabitat quality and thus biological potential is more typical of WWH than EWH.

Taken together, the lack of demonstrated EWH performance (historical or contemporary), the magnitude of the departure (greater than attributable to drought alone), and macrohabitat quality (reach QHEI average clearly in the WWH range), the upper seven miles of the West Fork are recommended to WWH.

The lower 13.7 miles of the West Fork are recommended to retain the existing EWH aquatic life use, despite drought related impairment. Like the upper reach, macroinvertebrate community performance at all sites failed the meet the EWH criteria, but in contrast to the headwaters, each station consistently yielded a strongly exceptional fish assemblage. Performance of the macrobenthos lagged behind the fish at all sites and thus drove use impairment. However, despite the drought, the macrobenthos remained within the WWH range, a level of departure from EWH criteria attributable to the temporal effects of drought. Therefore, it is not unreasonable to postulate that under normal flow conditions and for most years, the macrobenthos through the lower reach of the West Fork should at least meet the minimum EWH criteria.

- Headwater to RM 13.7, EWH (unverified) to WWH (verified)
- RM 13.7 to the mouth, EWH (Verfied)

Goerges Creek

The entire length of Georges Creek was originally designated EWH, unverified, as part of

the 1978 WQS. The 2007 survey marked the first evaluation of this Ohio Brush Creek tributary. Based upon the survey results, net community performance (attainment status) for Georges Creek was below the EWH criterion at all sampling locations. As observed elsewhere in study area, performance of the macrobenthos lagged well behind the fish assemblage, but no organism group (fish or macrobenthos) were found fully exceptional. Deviation from the existing, yet unverified, EWH criteria was greatest in the headwaters, below even the less stringent WWH criteria. The lower mile performed better by comparison, but still fell short of the EWH benchmark. Similarly, macrohabitat quality, as measured by the QHEI, improved longitudinally, but the reach average (64.8), is more typical of WWH than EWH.

Georges Creek is contained entirely within the glaciated Illinoian Tills region of the basin. The negative effects of the 2007 drought appeared exacerbated or otherwise heightened through this area, not only for the Georges Creek, but for other similarly situated water bodies. In comparison with the unglaciated portion of the Ohio Brush Creek basin, the vast majority of all documented use impairment identified in 2007 was concentrated in the smaller waters draining the glaciated uplands. Therefore, it appears as though the central tendency of smaller drainages or the upper segment of larger drainages contained within the Illinoian Till plains is aligned with WWH expectations rather than those for the EWH use. Due to the lack of demonstrated EWH performance (historical or contemporary) and the magnitude of the departure from the unverified criteria (greater than attributable to drought alone), Georges Creek is recommended to the more appropriate WWH aquatic life use.

- EWH (existing/unverified) to WWH (recommended)

Cherry Fork

Departure from the existing WWH aquatic life use was derived solely from the subpar performance of the benthic macroinvertebrate community, and was attributed to diminished surface flow and stream desiccation associated with drought conditions. The effects of background pollutant loads (natural or otherwise), safely assimilated in most years, as well as those from adjacent land use activities (primarily livestock production), were amplified by the lack of adequate dilution and assimilation, due to low flow. As a result, identified causes and sources beyond low flow and drought, respectively, are attendant to the drought, and thus considered secondary or tertiary in nature regarding their influence upon the water resource quality. Given the temporal nature and modest form of the primary and secondary impacts, it is not unreasonable to postulate that under normal flow conditions and for most years, Cherry Fork will support an assemblage of aquatic organisms consistent with the WWH aquatic life use. Therefore the retention of the exiting WWH use is recommended.

- Entire length, WWH (existing/verified)

Grace Run

Departure from the existing WWH aquatic life use was derived solely from the subpar performance of the benthic macroinvertebrate community, and was attributed to diminished surface flow and stream desiccation associated with drought conditions. The effects of background pollutant loads (natural or otherwise), safely assimilated in most years, as well as those from adjacent land use activities (primarily livestock production) were amplified by

the lack of adequate dilution and assimilation, due to low flow. As a result, identified causes and sources beyond low flow and drought, respectively, are attendant to the drought, and thus considered secondary or tertiary in nature regarding their influence upon the water resource quality. Given the temporal nature and modest form of the primary and secondary impacts, it is not unreasonable to postulate that under normal flow conditions and for most years, Grace Run will support and assemblage of aquatic organisms consistent with the WWH aquatic life use. Therefore the retention of the exiting WWH use is recommended.

- Entire length, WWH (existing/verified)

Buck Run
Reach evaluated was found to support an assemblage of aquatic organisms fully consistent with the existing WWH aquatic life use.

- Entire length, WWH (existing/verified)

Little West Fork
Aquatic life use impairment through the entire length of the Little West Fork was attributed primarily to diminished surface flow and stream desiccation associated with drought conditions. The effects of natural background pollutant loads, safely assimilated in most years, as well as those from adjacent land use activities (primarily livestock production) were amplified by the lack of adequate dilution and assimilation, due to low flow. As a result, identified causes and sources beyond low flow and drought, respectively, are attendant to the drought, and thus considered secondary or tertiary in nature, regarding their influence upon the water resource quality. Given the temporal nature and modest form of the primary and secondary impacts, it is not unreasonable to postulate that under normal flow conditions and for most years, the Little West Fork will support an assemblage of aquatic organisms consistent with the WWH aquatic life use. Therefore, the retention of the exiting WWH use is recommended.

- Entire length, WWH (existing/verified)

Elk Fork
Departures from the existing WWH aquatic life use criteria were derived from subpar performance of the benthic macroinvertebrate community. Aquatic life use impairments were attributed primarily to diminished surface flow and stream desiccation associated with drought conditions. The effects of natural background pollutant loads, safely assimilated in most years, as well as those from adjacent land use activities (livestock production) and a minor point source (Winchester WWTP) were amplified by the lack of adequate dilution and assimilation, due to low flow. As a result, identified causes and sources beyond low flow and drought, respectively, are attendant to the drought, and thus considered secondary or tertiary in nature, regarding their influence upon the water resource quality. Given the temporal nature and modest form of the primary and secondary impacts, it is not unreasonable to postulate that under normal flow conditions and for most years, Elk Fork would support an assemblage of aquatic organisms consistent with the WWH aquatic life use. Therefore, the retention of the exiting WWH use is recommended.

- Entire length, WWH (existing/verified)

Little East Fork
Departure from the existing WWH aquatic life use was derived solely from the subpar performance of the benthic macroinvertebrate community, and was attributed to diminished surface flow and stream desiccation associated with drought conditions. Given the temporal nature and modest form of the impact, it is not unreasonable to postulate that under normal flow conditions and for most years, the Little East Fork will support an assemblage of aquatic organisms consistent with the WWH aquatic life use. Therefore, the retention of the exiting WWH use is recommended.

- Entire length, WWH (existing/verified)

Shimer Run
The reach evaluated was found to support an assemblage of aquatic organisms fully consistent with the existing WWH aquatic life use.

- Entire length, WWH (existing/verified)

Crooked Creek
Departure from the existing WWH aquatic life use was derived solely from the subpar performance of the benthic macroinvertebrate community, and was attributed to diminished surface flow and stream desiccation associated with drought conditions. Crooked Creek stands as the only stream contained entirely with the ungalciated portion of the Ohio Brush Creek basin found to be impaired. Dewatering of Crooked Creek appeared a result of the combination of the effects of drought (primary cause) and the possibly loss of surface flow to geologic fissures associated with the Serpent Mound Disturbance or natural karst features in the basin (secondary cause). By their very nature, droughts are temporal phenomenon, and it follows that associated biological impairment observed in Crooked Creek is also temporal. Given this, the retention of the existing WWH use is recommended.

- Entire length, WWH (existing/verified)

Baker Fork
The reach evaluated was found to support an assemblage of aquatic organisms fully consistent with existing and recommended aquatic life uses. Owing to the unique geology of its headwaters, the Baker Fork basin showed sustained discharge throughout the summer sampling effort and therefore appeared relatively unaffected by the 2007 drought. Field observations did suggest a loss of stream flow in the very lowest reaches of the stream coinciding with the Serpent Mound Distrubance or other karst features in the basin. However, biological communities maintained exceptional quality through the lower reach, suggesting potential negative effects from dewatering were offset by the sustained, headwater flows.

- Headwaters to RM 10.98, WWH (existing/verified)
- RM 10.98 to mouth, WWH (existing/unverified) to EWH (recommended)

Middle Fork Baker Fork
The reach evaluated was found to support an assemblage of aquatic organisms fully

consistent with the existing aquatic life use, despite potential flow loss associated with drought, a large concentration of karst features in the basin, and its close proximity to the Serpent Mound disturbance area. Macroinvertebrate field observations suggested a loss of flow between the headwaters and the mouth but biological communities maintained good to exceptional quality.

- Entire length, WWH (existing/verified)

Strait Creek
Strong demonstrated exceptional performance of both the fish and benthic macroinvertebrate communities supports a redesignation of Strait Creek from WWH to EWH.

- WWH (existing/unverified) to EWH (recommended)

Muddy Fork
Departure from the existing WWH aquatic life use was derived solely from the subpar performance of the benthic macroinvertebrate community, and was attributed to direct channel modification and sedimentation. Owing to the unique geology of its headwaters, streams draining the Baker Fork basin typically showed sustained discharge through the drought of 2007. As such, Muddy Fork stands as one of the few water bodies within the Ohio Brush Creek watershed where the primary cause/source of use impairment appeared a result of deficient habitat, as opposed to drought. Use impairment derived from subpar macrohabitat, however, does not constitute a necessary and sufficient condition to lower water quality criteria through a change in aquatic life use designation (e.g., WWH to MWH). As the impact types presently identified for Muddy Fork are not the result of formal drainage maintenance activities sanctioned under Ohio Drainage Law, natural recovery, overtime, is likely. The process of natural restoration may be expedited by land use treatment aimed at reducing the delivery of fine sediment to Muddy Fork and/or direct channel reconfiguration to improve Muddy Fork's capacity to manage existing sediment loads. Given the the reasonable potential of Muddy Fork to support WWH communities, the retention of the existing WWH aquatic life use is recommended.

- Entire length, WWH (existing/verified)

Elk Run
The reach evaluated was found to support an assemblage of aquatic organisms fully consistent with the existing WWH aquatic life use.

- Entire length, WWH (existing/verified)

Elm Run
Departures from the existing WWH biocriteria were derived solely from the subpar performance of the benthic macroinvertebrate community and were attributed to diminished surface flow and stream desiccation associated with drought conditions. Given the temporal nature and modest form of the impact, the WWH use is recommended.

- Entire length, WWH (verified)

Lost Fork
The reach evaluated was found to support an assemblage of aquatic organisms fully consistent with the existing WWH aquatic life use.

- Entire length, WWH (verified)

Status of Non-Aquatic Life Uses
The current Industrial and Agricultural Water Supply use designations on Ohio Brush Creek and designated tributaries should remain in place. The Primary Contact Recreation use designation (Class A for Ohio Brush Creek and the West Fork Ohio Brush Creek and Class B for all others) is recommended for waterbodies evaluated as part of the 2007 Ohio Brush Creek survey.

Future Monitoring Needs
A complete reevaluation of the Ohio Brush watershed should be conducted in 2017. This is of particular importance given that both the 2008 and 1987 basin-wide intensive surveys coincided with severe droughts. Ohio Brush Creek is particularly susceptible to desiccation during typical years due to subregional geology, but its propensity to de-watering was exacerbated in the extreme during these extended droughts. Ambient biological performance, in many instances, was directly and negatively affected by the loss or significant dimunition of surface discharge. Therefore, it is imperative that the next intensive, basin-wide, survey be conducted during periods of normal summer flow, so as to better describe existing condition or reasonable biological performance. The pursuit of this objective may necessitate either the advancement or postponement of the next scheduled Ohio Brush Creek survey so as to accommodate or otherwise ensure, as far as practicle and possible, an evaluation based upon typical summer flows.

METHODS

All chemical, physical, and biological field, EPA laboratory, data processing, and data analysis methods and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio EPA 2006b), Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio Environmental Protection Agency 1987b, 1989b, 1989c, 2008a, 2008b), The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Rankin 1989), and Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (Ohio EPA 2006a). Sampling locations for the Ohio Brush Creek basin are listed in Table 6.

Determining Use Attainment 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 7-15). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which

indicates the response of the macroinvertebrate community. Three attainment status results are possible at each sampling location - Full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Non-attainment means that none of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table (Table 1) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (*i.e.,* full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and a sampling location description.

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, Ohio EPA 2006a). 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 in-stream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the habitat characteristics used to determine the QHEI score which generally ranges from 20 to less than 100. The QHEI is used to evaluate the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are *generally* conducive to the existence of warmwater faunas whereas scores less than 45 generally cannot support a warmwater assemblage consistent with the WWH biological criteria. Scores greater than 75 frequently typify habitat conditions which have the ability to support exceptional warmwater faunas.

Sediment and Surface Water Assessment

Fine grain sediment samples were collected in the upper 4 inches of bottom material at each location using decontaminated stainless steel scoops. Decontamination of sediment sampling equipment followed the procedures outlined in the Ohio EPA sediment sampling guidance manual (Ohio EPA 2001). Sediment grab samples were homogenized in stainless steel pans (material for VOC analysis was not homogenized), transferred into glass jars with teflon lined lids, placed on ice (to maintain 4°C) in a cooler, and shipped to the Ohio EPA Division of Environmental Services. Sediment data is reported on a dry weight basis. Surface water samples were collected, preserved and delivered in appropriate containers to either an Ohio EPA contract lab or the Ohio EPA Division of Environmental Services. Surface water samples were evaluated using comparisons to Ohio Water Quality Standards criteria, reference conditions, or published literature. Sediment evaluations were conducted using guidelines established in MacDonald *et al.* (2000) and Ohio Specific Reference Values (2003).

Macroinvertebrate Community Assessment

Macroinvertebrates were collected from artificial substrates and from the natural habitats. The artificial substrate collection provided quantitative data and consisted of a composite sample of five modified Hester-Dendy multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample was also collected. This sampling effort consisted of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, and margin). Detailed discussion of macroinvertebrate field and laboratory procedures is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989c, Ohio EPA 2008b).

Fish Community Assessment

Fish were sampled using pulsed DC electrofishing methods. Fish were processed in the field, and included identifying each individual to species, counting, weighing, and recording any external abnormalities. Discussion of the fish community assessment methodology used in this report is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989c, Ohio EPA 2008b).

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, or 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), in this document we are 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.

STUDY AREA

Ohio Brush Creek is a moderate sized direct Ohio River tributary, draining most of Adams County and portions of Highland, Brown, Ross and Pike counties (Figure 5). The total catchment area is 435 sq. miles, with an average mainstem gradient of 8.7 ft./mile. The West Fork is the only significant Ohio Brush tributary, draining 135 sq. miles, with an average gradient of 19.3 ft./mile. Smaller tributaries are numerous and typically drain less than 20 sq. miles, with gradients frequently exceeding 40 ft. /mile. These steep gradients are a result of the high relative relief of the uplands.

Figure 5. Ohio Brush Creek

Ohio Brush Creek courses through and drains a portion of the Interior Plateau (IP) ecoregion, which includes both glaciated (Illinoian age) and ungalciated regions of southern and southwestern Ohio. Topography varies from undulating to steep, with Ordovician and Silurian limestone and shale forming the dominant under lying bedrock. Soils derived from Illinoian glacial drift and loess dominates the uplands within the northwestern portion of the basin, with local relief ranging between 100 and 200 ft. (Whittier et al 1987; Omernik and Gallent 1988). The remainder of the watershed (east and southeastern portion) is unglaciated, with Cenozoic aged soils derived from collvium, residuum and related eroded materials associated with native bedrock. Relief through this area is typically 400 ft., but can exceed 800 ft. locally (Whittier et al 1987; Omernik and Gallent 1988).

Land uses in the Interior plateau vary with topography, but are primarily livestock, pasturage, cropland, and forest. Most of the basin is sparsely populated and within the heart of the watershed, Adams County, land use is roughly split between agriculture (livestock and croplands) and forest (Ohio EPA 1989a).

Surface flow or stream discharge of Ohio Brush Creek fluctuates widely throughout the year and can even vary substantially on a daily basis. Runoff is rapid in the hill county and peak flows generally follow shortly after heavy precipitation. In contrast, during extended dry periods, surface flows often go intermittent, interstitial or very low, due to a paucity of sustained ground water input. The latter was directly observed during the 2007 survey which coincided with an extreme drought.

Due to a unique and diverse geology and attendant diverse habitat types, Adams County is biologically diverse, supporting some of the highest numbers of State listed rare, threatened or endangered species in Ohio. Various regional and national conservation organizations and State and related governmental agencies manage thousands of acres within the Ohio Brush Creek watershed. These include Edge of Appalachia Preserve, Arc of Appalachia Preserve System, Fort Hill, Serpent Mound, Davis Memorial State Nature Preserve, Tranquility State Wildlife Area, and Adams Lake State Park.

Sixty-seven environmental monitoring stations were distributed among the 25 named streams that comprise the Ohio Brush Creek watershed. The various types of monitoring data were generated from these stations, and included ambient biology (fish and macroinvertebrates), ambient water chemistry, bacteria, and sediment chemistry. Although selected parameters were limited in distribution, multiple data types were collected at most sampling stations. Detailed listing and spatial distribution of the 2007 monitoring effort are found in Table 6 and Figure 6.

Serpent Mound Disturbance

The Serpent Mound Disturbance (SMD) is located in the northern part of Adams County at the intersection of Pike and Highland Counties and just outside the glacial boundary (Figure 7). SMD is named after the prehistoric Native American effigy earthwork located in the southwest section of the disturbance. Serpent Mound State Memorial is an effigy representation of a snake with what appears to be an egg in its mouth. This effigy was once thought to represent a meteor with a vapor trail. Current thinking is that the only relation between the mound and the geologic structure is location.

The SMD is nearly a perfect circle of 4.5 to 5 miles in diameter and covers approximately 20 sq. miles. The disturbance is made up of three major structural elements: the central uplift, inner transition zone and a outer ring-gaben zone. The disturbance has a tortured geology of highly faulted and folded sedimentary rock of Ordovician through Mississippian ages. The origin of the SMD has been debated since the first written description by John Locke of the Ohio Geological Survey in 1838. Mr. Locke named the area the “Sunken Mountain” (Baranoski et.al. 2003). It was later known as the Serpent Mound cryptoexplosion or cryptovolcanic structure as it was thought that the formation was caused by a violent explosion of highly pressurized gases from deep within the Earth. The current explanation for the SMD’s origin is a meteor impact prior to 256 million years ago. This conclusion has been verified by surface and, for the first time, subsurface investigations of the SMD.

The central uplift area is composed of upper Ordovician and lower Silurian rock. Those older rock units are higher in elevation than the younger middle Silurian, upper Devonian and lower Mississippian rocks that compose the inner transition and outer ring-gaben zones. The central uplift rock has been folded and faulted throughout this structure and is estimated to have been lifted 1000 feet up from its original elevation. Erosion over the millennia has reduced this area to its current elevation. The inner transition zone is folded and faulted as well, but has not been lifted or dropped in elevation. The outer ring-gaben zone is generally faulted and has dropped lower in elevation (at least 180 feet) than similar rock units outside of the SMD area.

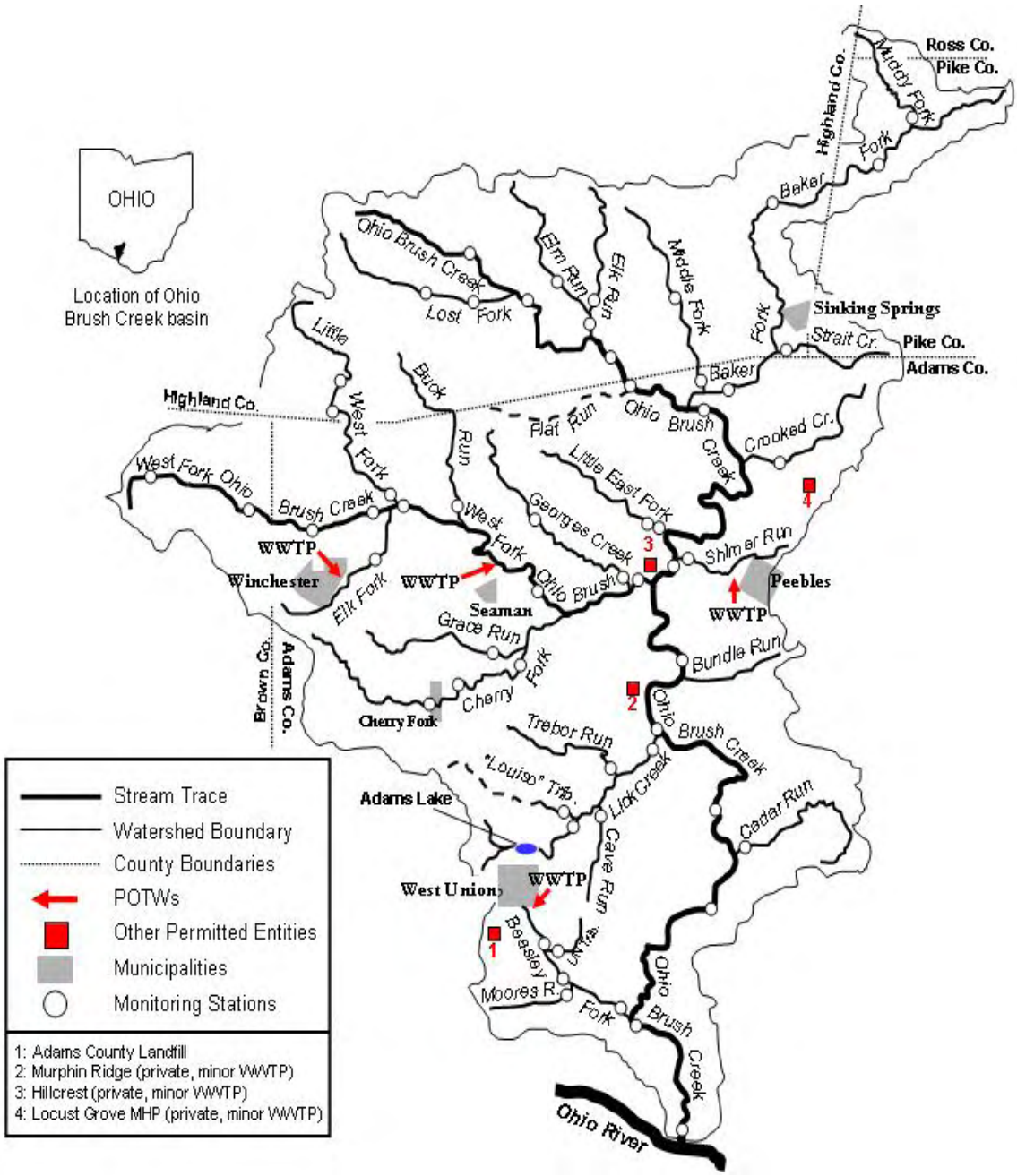


Figure 6. The Ohio Brush Creek study area showing principle streams and tributaries, population centers, pollutions sources, and the location of water resource monitoring stations.

Table 6. Environmental monitoring stations in the Ohio Brush Creek study area, 2007 [F-fish community, B-benthic macroinvertebrate community, C-water column chemistry, D-diel water chemistry (Datasonde), S-sediment metals and organics, and E-chemical sampling of 001 outfall). Note: The river miles listed below are the STORET location Point of Record (POR) identifiers. Sample type river mile collection locations may vary slightly from the POR listing.

Stream Station ID	**River Mile**	**Sample Type**	**Landmark**	**County**	**Latitude Longitude**	**7.5' USGS Quad.**
Ohio Brush Creek (10-200)						
200740	54.7	(F,B,C)	Deafall Rd.	Highland	39.0958 83.5686	Belfast
300295	52.5	(F,B,C)	Peach Orchard Rd.	Highland	39.0753 83.5458	Belfast
300294	47.2	(F,B,C)	Dst. Elk Run, at footbridge	Highland	39.0492 83.4919	Sinking Spring
X04S22	45.14	(C,S)	Adj. TR 113 (Ref. Site)	Adams	39.0383 83.4761	Sinking Springs
X04S22	44.9	(F,B)	Adj. TR 113 (Ref. Site)	Adams	39.0356 83.4781	Sinking Spring
X04G01	40.4	(F,B,C,S)	SR 73, at Serpent Mound	Adams	38.0147 83.4314	Sinking Spring
X04G01	39.0	(B)	SR 73, at Serpent Mound	Adams	39.0231 83.4359	Sinking Spring
X04S20	30.4	(F,B,C)	Dst. Shimer Run	Adams	38.9489 83.4500	Peebles
300292	28.8	(C)	Dst. Hillcrest Nursing Home, via Trib.	Adams	38.9389 83.4683	Peebles
X04S19	25.0	(C,D,S)	Adj Lawshe Rd. (Ref. Site)	Adams	38.9057 83.4507	Peebles
X04S19	24.8	(F,B)	SR 41, adj Lawshe Rd. (Ref. Site)	Adams	38.9022 83.4517	Peebles
300291	21.4	(F,B,C)	Fawcett Rd.	Adams	38.8686 83.4592	Lynx
X04S18	15.2	(F,B,C,S)	TR 84 (Ref. Site)	Adams	38.8267 83.4281	Lynx
600660	13.16	(C,D,S)	USGS Gage (Sentinal Site)	Adams	38.8036 83.4215	Lynx
600650	10.4	(F,C)	SR 125	Adams	38.7889 83.4297	Lynx
600650	10.0	(B)	SR 125	Adams	38.7790 83.4524	Lynx
X04S17	6.0	(F,B,C,D)	Dst. Beasly Fork	Adams	38.4722 83.4722	Concord
300290	0.5	(F,B,C)	US 52 (Ohio River backwater)	Adams	38.6758 83.4481	Concord
Lost Fork (10-237)						
200739	2.5	(F,B,C)	SR 247	Highland	39.0819 83.5942	Belfast
200738	1.7	(F,B,C)	Peach Orchard Rd.	Highland	39.0786 83.5781	Belfast
Elk Run (10-234)						
300306	1.5	(B)	Ust. Elm Run	Highland	39.07788 83.50266	Belfast
300306	1.4	(F)	Ust. Elm Run	Highland	39.07610 83.50470	Belfast
300306	1.3	(C)	Ust. Elm Run	Highland	39.0761 83.5047	Belfast

Table 6. continued.

Stream Station ID	**River Mile**	**Sample Type**	**Landmark**	**County**	**Latitude Longitude**	**7.5' USGS Quad.**
200733	0.9	(B,C)	Cross Rd.	Highland	39.0703 83.5019	Belfast
200733	0.8	(F)	Cross Rd.	Highland	39.0694 83.5017	Belfast
Elm Run (10-233)						
300305	1.75	(F,C)	Deadfall Rd.	Highland	39.0928 83.5233	Belfast
300305	0.6	(B)	North Union Rd.	Highland	39.08016 83.51329	Belfast
Baker Fork (10-240)						
200730	14.8	(B,C)	Dry Bone Rd.	Pike	39.148321 83.339746	Bainbridge
200730	14.7	(F)	Dry Bone Rd.	Pike	39.1483 83.3400	Bainbridge
200729	10.5	(F,B,C)	Fort Hill Rd.	Highland	39.1244 83.3964	Sinking Spring
X04G02	1.5	(F,B,C,S)	Honer Chapel Rd. (Sentinel Site)	Adams	39.0408 83.4225	Sinking Spring
Middle Fork Baker Fork (10-241)						
200727	5.4	(F,B,C)	Sinking Creek Rd.	Highland	39.091649 83.458541	Sinking Spring
200725	0.3	(F,B)	Strait Creek Rd.	Adams	39.0347 83.4392	Sinking Spring
200725	0.2	(C)	Strait Creek Rd	Adams	39.034784 83.439136	Sinking Spring
Strait Creek (10-245)						
300309	0.8	(F)	Adj. SR 41, at Strait Creek Rd.	Highland	39.0564 83.3917	Sinking Spring
300309	0.6	(B,C)	Adj. SR 41, at Strait Creek Rd.	Highland	39.0569 83.3914	Sinking Spring
Muddy Fork (10-246)						
300309	0.4	(F,B,C)	Frost Rd.	Pike	39.1633 83.3219	Bainbridge
Crooked Creek (10-218)						
200724	2.2	(F,B,C)	SR 73	Adams	39.0019 83.3950	Sinking Spring
Little East Fork (10-216)						
X04P04	0.9	(F,B,C,S)	Old SR 32 (Ref. Site)	Adams	38.9697 83.4636	Peebles
200721	0.4	(F,B,C)	TR 243	Adams	38.9653 83.4564	Peebles
Shimer Run (10-248)						
X04S06	NA	(E)	Effluent, Peebles WWTP 001 Outfall	Adams	38.9486 83.4197	Peebles
XO4S32	2.18	(C)	Dst. Peebles WWTP	Adams	38.9486 83.4194	Peebles
X04505	0.1	(F,B)	At mouth	Adams	38.9489 83.4508	Peebles

Table 6. continued.

Stream Station ID	**River Mile**	**Sample Type**	**Landmark**	**County**	**Latitude Longitude**	**7.5' USGS Quad.**
West Fork Ohio Brush Creek (10-220)						
300300	20.5	(F,B,C)	Heaton Rd.	Brown	38.9903 83.7342	Winchester
300299	17.9	(F,B,C)	Melblanc Rd.	Brown	38.9775 83.6961	Winchester
200716	15.6	(C)	SR 136, dst. Turkey Run	Adams	38.9683 83.6542	Winchester
200716	15.2	(F,B)	SR 136, dst. Turkey Run	Adams	38.9686 83.6539	Winchester
X04S28	12.7	(F,B,C,S)	CR 37 (Ref. Site)	Adams	38.9742 83.6142	Seaman
X04S27	10.5	(F,B,C)	Ust. Little West Fork	Adams	38.9744 83.5917	Seaman
300301	7.5	(C)	Dst. Seaman WWTP, via UN Tributary	Adams	38.9486 83.5719	Seaman
X04S26	6.1	(F,B,C)	SR 770	Adams	38.9744 83.5917	Seaman
X99Q08	1.1	(F,B,C,S)	Dst. Georges Creek	Adams	38.9369 83.4842	Peebles
X04S25	0.37	(C,S)	Peterson Rd. (Sentinel Site)	Adams	38.9394 83.4744	Peebles
Elk Fork (10-230)						
X04S02	1.6	(F,B,C)	Tri-County Rd.	Adams	38.9472 83.6222	Seaman
Little West Fork (10-229)						
300304	6.3	(F,B,C)	Forsythe Rd.	Highland	39.0344 83.6419	Sugar Tree Ridge
200715	5.7	(F,B,C)	Shaw-Baker Rd.	Highland	39.0269 83.6458	Sugar Tree Ridge
200713	0.1	(F,B,C)	Buck Run Rd.	Adams	38.9753 83.5925	Seaman
Buck Run (10-228)						
300303	0.4	(F,B,C)	Armstrong Rd.	Adams	38.9694 83.5711	Seaman
Unnamed West Fork Ohio Brush Creek Tributary @ RM 7.38 (Reciveing Stream for Seaman WWTP)						
X04S09	0.8	(C)	Ust. Seaman WWTP	Adams	38.948322 83.572081	Seaman
X04S08	NA	(E)	Seaman WWTP 001 Outfall	Adams	38.9488746 83.5714212	Seaman
Cherry Fork (10-224)						
300302	8.7	(F,B,C)	SR 316	Adams	38.8844 83.6147	Seaman
200710	7.5	(F,B,C)	Paint Rd.	Adams	38.8844 83.5947	Seaman
X04P07	2.6	(F,B,C,S)	Graces Run Rd.	Adams	38.9075 83.5439	Seaman
Grace Run (10-225)						
200709	1.4	(B)	SR 247	Adams	38.910300 83.548933	Seaman

Table 6. continued.

Stream Station ID	**River Mile**	**Sample Type**	**Landmark**	**County**	**Latitude Longitude**	**7.5' USGS Quad.**
200709	1.3	(F,C)	SR 247	Adams	38.9103 83.5656	Seaman
Georges Creek (10-225)						
200708	3.8	(B)	Adj. SR 770	Adams	38.965958 83.537270	Seaman
200708	3.2	(F,C)	Adj. SR 770	Adams	38.9661 83.5369	Seaman
X04P05	0.1	(F,B,C)	Nicholes Rd.	Adams	38.9381 83.4875	Peebles
Lick Fork (10-211)						
X99Q05	4.3	(F,B)	Ust. UN Lick Frk. Tributary (Ref. Site)	Adams	38.8306 83.5039	West Union
X99Q05	4.1	(C)	Ust. UN Lick Frk. Tributary (Ref. Site)	Adams	38.8325 83.5019	West Union
X04P09	1.03	(B,C,S)	Vaughn Ridge Rd.	Adams	38.8581 83.4669	Lynx
X04P09	0.7	(F)	Vaughn Ridge Rd. (Sentinel Site)	Adams	38.86419 83.462438	Lynx
Trebor Run (10-212)						
X4P12	0.1	(F,B,C,S)	SR 41 (Ref. Site)	Adams	38.8508 83.4828	Lynx
Cave Run (10-213)						
X99Q07	0.1	(F,B,C,S)	Near mouth (Ref. Site)	Adams	38.8403 83.4800	Lynx
Unnamed Lick Fork Tributary @ RM 4.02 (10-250)[AKA Louiso Tributary]						
200704	2.8	(C)	At Farm Lane	Adams	38.8381940 83.5432439	West Union
X99Q06	0.2	(F,B)	At mouth	Adams	38.8325 83.5044	West Union
X99Q06	0.1	(C)	At mouth	Adams	38.8331 83.5028	West Union
Cedar Run (10-209)						
X04P10	0.4	(F,B,C)	Gustin Rd.	Adams	38.8114 83.4153	Lynx
Beasley Fork (10-205)						
300296	5.8	(C)	Dst. W. Union WWTP, ust. Adams Co. Landfill	Adams	38.77572 83.53456	West Union
X04S13	NA	(E)	West Union WWTP 001 Outfall	Adams	38.7886 83.5431	West Union
X04524	4.7	(F,B)	Dst. West Union WWTP	Adams	38.7661 83.5253	West Union
X04524	4.6	(C)	Dst. West Union WWTP	Adams	38.7653 83.5236	West Union
X04510	3.2	(F,B,C)	SR 247	Adams	38.7492 83.5161	Manchester Island
X04523	0.8	(F,B,C,D)	At mouth	Adams	38.7367 83.4786	Concord
Unnamed Beasley Fork Tributary @ RM 4.6 (10-252)						
300297	0.2	(F,B,C)	Trotter Rd.	Adams	38.7667 83.5211	West Union

Table 6. continued.

Stream Station ID	**River Mile**	**Sample Type**	**Landmark**	**County**	**Latitude Longitude**	**7.5' USGS Quad.**
Moores Run (10-206)						
300310	0.4	(B)	SR 247	Adams	38.717989 83.520010	Manchester Island
300310	0.2	(F,C)	SR 247	Adams	38.746546 83.518292	Manchester Island

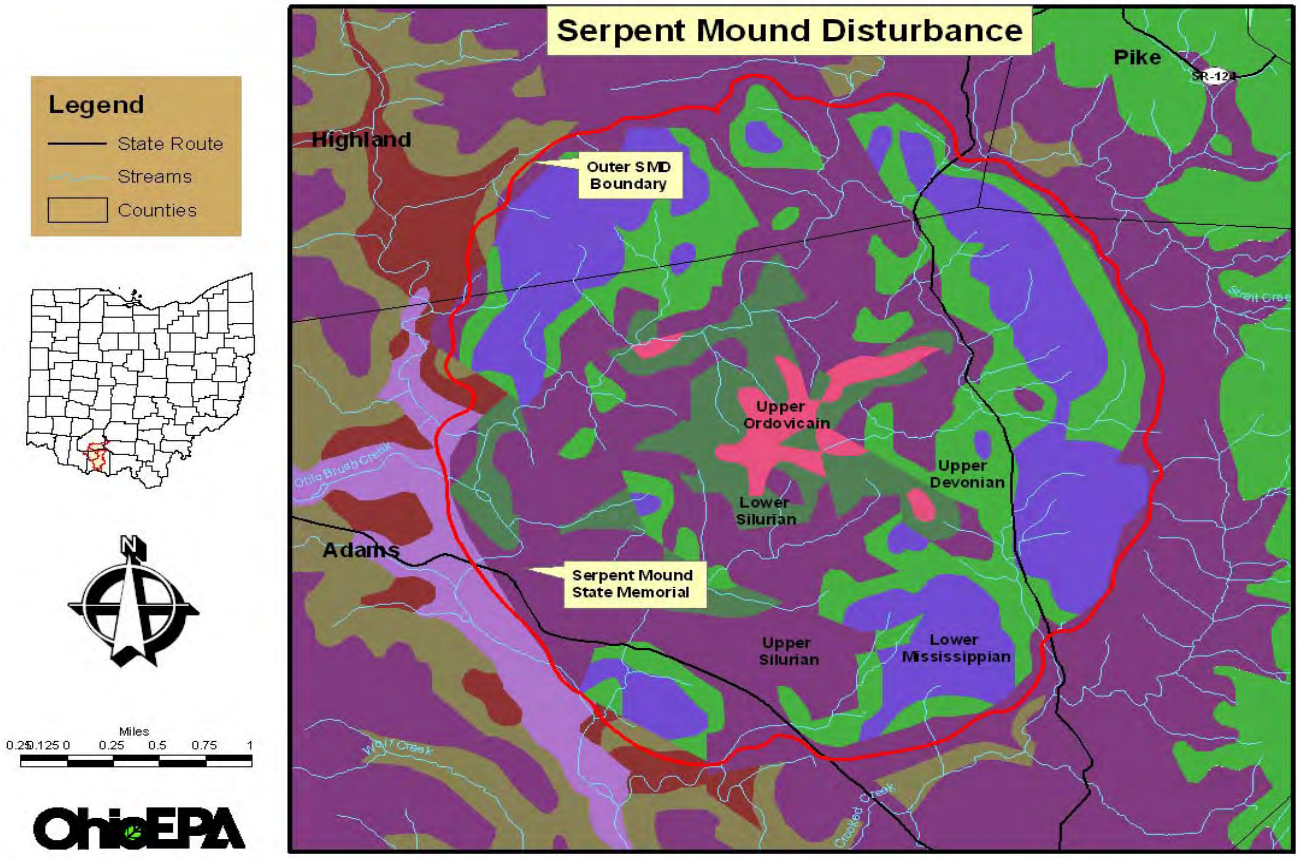


Figure 7. Geological formations in the area of the Serpent Mound Disturbance in the Ohio Brush Creek watershed (Baramoski et al. 2003).

Results

Pollutant Loads

A total of seven National Pollution Discharge Elimination System (NPDES) permitted facilities discharge wastewater and storm water into tributaries of Ohio Brush Creek in Adams County (Table 7). Included in this list are six municipal wastewater treatment plants (WWTPs) and one landfill facility. Each facility is required to monitor their effluent discharge(s), and report the results to the Ohio EPA on a monthly basis. Four of the facilities were monitored by Ohio EPA during the 2007 survey.

Table 7. Ohio Brush Creek permitted effluent discharge locations, 2007. MGD= million gallons per day.

Facility Name	Ohio EPA Permit No.	City	Location of discharge	Design Flow (MGD)	Type of Discharge
Murphin Ridge Inn	0PR00091	West Union	U.T. to Polk Run	0.0022	Wastewater
Hillcrest Nursing Home	0PX00018	Lawshe	U.T. to Ohio Brush Creek	0.008	Wastewater
Winchester WWTP	0PB00050	Winchester	Elk Fork	0.17	Wastewater
Peebles WWTP	0PB00069	Peebles	Shimmer Run	0.42	Wastewater
Seaman WWTP	0PB00098	Seaman	U.T. to W. Fk. Ohio Brush Creek	0.180	Wastewater
West Union WWTP	0PC00019	West Union	Beasley Fork	0.60	Wastewater
Adams County Landfill	0IN00179	West Union	U.T. to Beasley Fork	NA	Industrial

Winchester WWTP

The Winchester WWTP is located in the village of Winchester in the northwestern corner of Adams County and is a publicly owned treatment works providing wastewater treatment for the village. The population served by this treatment plant is estimated at 1,025 people. The design flow is 0.17 MGD with an annual average flow of 0.149 MGD for 2007. Treatment includes stabilization pond, aerated lagoon and evapotranspiration field.

Murphin Ridge Inn

Murphin Ridge Inn is located at 750 Murphin Ridge Road in West Union and is a privately owned treatment works providing wastewater treatment for 10 inn rooms, 9 cabins, and restaurant waste. Treatment includes a septic tank with subsurface sand filtration and a chlorinator.

Hillcrest Nursing Home

The Hillcrest Nursing Home is located at 3564 Lawshe Road in the village of Lawshe and discharges to an unnamed tributary to Ohio Brush Creek. The Hillcrest Nursing Home is a privately operated nursing facility which treats sanitary waste. Treatment includes an extended aeration system with both chlorination and dechlorination.

Peebles WWTP

The Peebles WWTP is located at 195 Chautauqua Street in Peebles and is a publically owned treatment works providing wastewater treatment for the village of Peebles. The population served by this treatment plant is estimated at 1,950 people. The design flow is 0.42 MGD with an annual average flow of 0.196 MGD for 2007. Treatment includes influent pumping, bar screen, grit removal, scum removal, oxygen ditch, secondary clarification, chlorination and dechlorination.

Seaman WWTP
The Seaman WWTP is located at 20 Locust St in Seaman and is a publically owned treatment works providing wastewater treatment for the village of Seaman. The population served by this treatment plant is estimated at 1,059 people. The design flow is 0.18 MGD with an annual average flow of 0.111 MGD for 2007. Treatment includes influent pumping, bar screen, comminutor, primary sedimentation, trickling filter-plastic media, secondary clarification, sand filter, chlorination and dechlorination.

West Union WWTP
The West Union WWTP is located at 517 North Market Street in West Union and is a publically owned treatment works providing wastewater treatment for the village of West Union. The population served by this treatment plant is estimated at 3,300 people. The design flow is 0.6 MGD with an annual average flow of 0.51 MGD for 2007. Treatment includes bar screen, grit removal, primary sedimentation, trickling filter-plastic media, sand filter, post-aeration, and ultraviolet disinfection. The West Union WWTP discharges to the headwaters of Beasley Fork.

Adams County Landfill
The Adams County Landfill is located just south of West Union at 4150 Pumpkin Ridge Road. The Adams County Landfill is a closed solid waste disposal landfill. Total suspended solids in the form of silt or sediment is the primary pollution of concern. A sediment collection pond was installed during the landfill's final closure activities to collect all storm water runoff from the landfill prior to discharging to an unnamed tributary to Beasley Fork.

Chemical Water Quality
Surface water grab samples were collected from the Ohio Brush Creek watershed at 66 locations between June 25 and September 12, 2007. Monthly grab water samples were also collected at three sentinel stations within the watershed from December 19, 2006 to September 12, 2007. Stations were established in free-flowing sections of the streams and were primarily collected from bridge crossings.

A United States Geological Survey (USGS) gage station is located on Ohio Brush Creek at West Union and was used to show flow trends for the summer of 2007 (Figure 2). Dates when water samples and bacteria samples were collected in the Ohio Brush Creek watershed are noted on the graph. Flow conditions during the 2007 sampling season were below the historical monthly median flows throughout the summer and fell below the 7Q10 threshold in September indicating a severe drought. Both water and bacteria samples were collected during low flow conditions in the Ohio Brush Creek watershed during the survey.

Surface water samples were analyzed for metals, nutrients, bacteria, suspended and dissolved solids, PCBs, semivolatile organic compounds, and organochlorinated pesticides (Appendix Tables 1-3). Parameters which were in exceedance of Ohio WQS criteria are reported in Table 8. Bacteriological samples were collected from 66 locations, and the results are reported in the Recreation Use section.

Organic chemical analyses were conducted on water samples collected from sixteen locations. Aside from the pesticides a-BHC, 4,4 DDD, and heptachlor epoxide, all PCBs and pesticide measurements were reported as not detected. All analyses for semivolatile organic

compounds were reported as not detected. All of the detectable pesticides were below the Ohio WQS criteria.

Metals were measured at 66 locations, with 17 parameters tested. Exceedances of iron were found in Elk Run and in Ohio Brush Creek downstream from Elk Fork. One exceedance of barium occurred in Cherry Fork at Paint Road. No other metals exceedances were observed in the Ohio Brush Creek basin.

Many areas of Ohio Brush Creek had D.O. values that were below the level needed for the protection of the designated EWH (average of 6.0 mg/l and minimum of 5.0 mg/l) and WWH (average of 5.0 mg/l and minimum of 4.0 mg/l) aquatic life uses. This was most likely due to the extreme low flow conditions that occurred during the summer from May through September.

Elevated nutrient concentrations are typically associated with either farming, animal husbandry or the treatment of wastewater. Nutrients were relatively low in the Ohio Brush Creek mainstem (Table 9). However, high nutrient concentrations occurred downstream from the West Union WWTP on Beasley Fork. Nutrient samples from the West Union WWTP, Peebles WWTP, Seaman WWTP and Hillcrest Nursing Home all were elevated for either ammonia, nitrate+nitrite-N or total phosphorus. Muddy Fork also had elevated nutrient levels above reference conditions which may be associated with wildlife and/or farming activities in the headwaters. Farming activity is more prevalent in the western section of the watershed and elevated nutrients were found in several of these streams including Grace Run, Cherry Fork, West Fork, Little West Fork and Lick Run. Failing home septic treatment systems may also contribute to elevated nutrient levels.

Table 8. Exceedences of Ohio Water Quality Standards criteria (OAC3745-1) for chemical/physical parameters measured in the Ohio Brush Creek watershed, 2007. Bacteria exceedances are presented in the Recreation Use section.

Location with River Mile (RM)	**Parameter (value – ug/l unless noted)**
Exceptional Warm Water Habitat (EWH) Stream Sites in the Ohio Brush Creek Watershed	
Ohio Brush Cr. @ Peach Orchard Rd (RM 52.49)	D.O. (5.39 mg/l [b])
Ohio Brush Creek Dst Elk Run (RM 47.16)	Iron (9570[c]), D.O. (4.96 mg/l [a])
Ohio Brush Creek at Heron Ford Rd (RM 45.14)	D.O. (5.34 mg/l [b])
Ohio Brush Creek dst Shimmer Run (RM 30.5)	D.O. (5.5 mg/l [b])
Ohio Brush Creek dst Hillcrest (RM 28.8)	D.O. (5.47 mg/l [b])
Ohio Brush Creek at TR 84 (RM 15.2)	D.O. (5.83 mg/l [b])
Ohio Brush Creek at SR 348 (RM 13.16)	D.O. (5.91 mg/l [b], 5.83 mg/l [b])
Ohio Brush Creek at SR 125 (RM 10.0)	D.O. (5.29 mg/l [b])
West Fk. Ohio Brush Creek at CR 37 (12.7)	D.O. (4.39 mg/l [a])
West Fk. Ohio Brush Creek (RM 10.5)	D.O. (4.7 mg/l[a], 4.92 mg/l[a])
West Fk. Ohio Brush Cr at SR 32(RM 6.1)	D.O. (5.71 mg/l [b])
West Fk. Ohio Brush Cr at Peterson Rd (RM 0.37)	D.O. (5.66 mg/l [b])
Cedar Run near mouth (RM 0.38)	D.O. (5.35 mg/l [b])
Warm Water Habitat (WWH) Stream Sites in the Ohio Brush Creek Watershed	
Ohio Brush Creek at US Rt 52 (RM0.5)	D.O. (4.54 mg/l [b])
W. Fk. Ohio Br. Cr. Heaton Road (RM 20.5)	D.O. (2.61 mg/l [a], 4.34 mg/l[b])
W. Fk Ohio Brush Cr @ Melblanc Rd. (RM 17.9)	D.O. (4.06 mg/l [b])
W. Fk. Ohio Br. Cr. Dst Turkey Run (RM 15.6)	D.O. (3.67 mg/l [a])
Beasely Fork near mouth (RM 0.75)	D.O. (4.35 mg/l [b], 4.39 mg/l [b])
Elk Run N.E. of Belfast at Coss Rd (RM 0.9)	Iron (8250[c])
Little East Fork at mouth (RM 0.1)	D.O. (4.35 mg/l [b], 4.92 mg/l [b])
Trib to Lick Fork (RM 4.02) near mouth (RM 0.1)	D.O. (4.83 mg/l [b])
Cherry Fork at Paint Rd (RM 7.5)	Barium (244 [b])
Baker Fork at Dry Bone Road 9RM 14.8)	D.O. (4.29 mg/l [b], 4.54 mg/l [b])
Baker Fork at Fort Hill Road (RM 10.5)	D.O. (4.73 mg/l [b], 4.86 mg/l [b])
Crooked Creek at SR 73 (RM 2.2)	D.O. (4.17 mg/l [b])
Cherry Fork at Grace Run Rd (RM 2.61)	D.O. (3.92 mg/l [a])
Cherry Fork at SR 136 (RM 8.74)	D.O. (2.09mg/l [a], 3.49 mg/l [a])
Graces Run @ SR 247 (RM1.4)	D.O. (3.19 mg/l [a])
Buck Run at Armstrong Road (RM 0.38)	D.O. (3.3 mg/l [a])
Elk Fork dst Winchester WWTP at SR 32 (RM 1.61)	D.O. (3.84 mg/l)
Elm Run at Deadfall Rd (RM 1.75)	D.O. (3.54 mg/l)
Georges Creek at mouth (RM 0.1)	D.O. (2.81 mg/l [a], 4.83 mg/l [b])
Lost Fork at Peach Orchard Road (RM 1.7)	D.O. (4.59 mg/l [b])
Little West Fork at Forsyth Rd. (RM 6.26)	D.O. (4.88 mg/l [b])
Little West Fork at Shaw Baker Rd (RM 5.7)	D.O. (3.58 mg/l, 3.98 mg/l)
Middle Fk Baker Fk at Straight Cr. Rd. (RM 0.2)	D.O. (3.22 mg/l [a])
Straight Creek at Straight Creek Rd (RM 0.6)	D.O. (3.62 mg/l [a], 3.45 mg/l [a])
Cave Run (RM 0.1)	D.O. (4.63 mg/l [b])

[a] Exceedence of the aquatic life Outside Mixing Zone Maximum water quality criterion (below minimum for D.O.).

[b] Exceedence of the aquatic life Outside Mixing Zone Average water quality criterion (below **24 hour** average for D.O).

[c] Exceedence of the statewide water quality criteria for the protection of agricultural uses.

[d] Exceedence of the Human Health drink and non-drink criterion.

Table 9. Mean values for select nutrient water quality parameters sampled in the Ohio Brush Creek study area, 2007. The 90th percentile value from reference sites from the Western Allegheny Plateau (WAP) and Interior Plateau (IP) ecoregions are shown below for comparison. Reference values vary based on drainage area (DA) and ecoregion. Values above reference conditions are shaded green. Point source effluent data are shaded gray.

Location	RM	DA mi^2	Eco-region	Ammonia	Nitrate+Nitrite-N	Phosphorus-T
OHIO BRUSH CREEK NW OF BELFAST @ DEADFALL RD.	54.7	7.8	IP	0.041	0.098	0.023
Ohio Brush Creek @ Peach Orchard Rd.	52.49	26	WAP	0.036	0.090	0.007
Ohio Brush Creek DST Elk Run	47.16	52.4	WAP	0.047	0.063	0.050
OHIO BRUSH CK @ HERON RD FORD (TR 115) S OF COUNTY LINE	45.14	55	IP	0.043	0.070	0.023
OHIO BRUSH CK @ SR 73 AT SERPENT MOUND	40.4	130	IP	0.027	0.258	0.035
OHIO BRUSH CK JUST DST SHIMER RUN	30.5	174	IP	0.025	0.103	0.085
Ohio Brush Creek DST Hillcrest Nursing Home in Lawshe	28.8	176	WAP	0.025	0.075	0.011
OHIO BRUSH CK ADJ LAWSHE RD SW OF PEEBLES	25	315	IP	0.032	0.050	0.014
Ohio Brush Creek @ Fawcett Rd.	21.35	328	WAP	0.025	0.050	0.015
OHIO BRUSH CK @ END OF TR 84	15.2	371	IP	0.040	0.050	0.013
OHIO BRUSH CK @ SR 348 NR WEST UNION	13.16	387	IP	0.035	0.283	0.025
OHIO BRUSH CK @ SR 125 NR WEST UNION	10	396	IP	0.025	0.088	0.012
OHIO BRUSH CK DST BEASLEY FK	6	423	IP	0.025	0.150	0.024
Ohio Brush Creek at US Rt. 52	0.5	435	WAP	0.102	0.648	0.023
Beasley Fork DST West Union WWTP UST Landfill	5.8	0.9	WAP	0.025	13.625	2.993
BEASLEY FK ADJ SR 247 DST WEST UNION	4.6	3.4	IP	0.025	11.258	2.520
BEASLEY FK @ SR 247 DST WEST UNION	3.2	9.7	IP	0.032	4.040	0.957
BEASLEY FK @ FORD NR MOUTH	0.75	18	IP	0.030	0.684	0.104
CEDAR RUN JUST UPST STARLEY-GUSTIN RD (TR 58A) NR MOUTH	0.38	11.1	IP	0.025	0.183	0.005
LICK FK NE OF WEST UNION, UPST. TRIBUTARY (4.02)	4.1	7.9	IP	0.041	0.205	0.046
LICK FK JUST UPST VAUGHN RIDGE RD	1.03	30.9	IP	0.034	0.328	0.021
TREBER RUN @ SR 41 AT MOUTH	0.1	7.2	IP	0.025	0.070	0.015
CAVE RUN NEAR MOUTH, ADJ. GRAVEL LANE	0.1	3.8	IP	0.025	0.080	0.009
Bundle Run @ Trail off SR 781 from Jackson	0.68	6	WAP	0.025	0.300	0.033
LITTLE EAST FK @ SR 74 NW OF PEEBLES	0.9	6.9	IP	0.035	0.063	0.027
LITTLE EAST FORK NW OF PEEBLES @ MOUTH	0.1	10.1	IP	0.072	0.135	0.078
CROOKED CREEK NW OF LOCUST GROVE, UPST. ST. RT. 73	2.2	8.3	IP	0.119	0.328	0.047
W. Fk Ohio Brush Cr. @ Heaton Rd.	20.53	4.8	WAP	0.098	0.263	0.066
W. Fk Ohio Brush Cr @ Melblanc Rd.	17.92	12	WAP	0.078	0.248	0.053
W. FK. OHIO BRUSH CREEK NW OF WINCHESTER, DST. TURKEY RUN	15.6	21.9	IP	0.044	0.138	0.042
W FK OHIO BRUSH CK @ CR 37 NW OF SEAMAN	12.74	27.3	IP	0.039	0.300	0.041
W FK OHIO BRUSH CK UPST LITTLE WEST FK	10.5	38.9	IP	0.046	0.083	0.032
W FK OHIO BRUSH CK @ SR 32 NE OF SEAMAN	6.1	76	IP	0.044	0.050	0.052
W. FK. OHIO BRUSH CREEK W OF LAWSHE, DST. GEORGES CREEK	1.1	129	IP	0.086	0.120	0.021
W FK OHIO BRUSH CK @ PETERSON RD	0.37	134	IP	0.043	0.331	0.028
GEORGES CREEK N OF TRANQUILITY, ADJ. ST. RT. 770	3.2	5.9	IP	0.121	0.500	0.069

Table 9. Continued

Location	RM	DA mi^2	Eco-region	Ammonia	Nitrate+Nitrite-N	Phosphorus-T
GEORGES CK @ MOUTH	0.1	12.3	IP	0.048	0.058	0.029
Cherry Fork @ St. Rt. 136	8.74	5.7	WAP	0.827	0.403	0.201
CHERRY FORK E OF TOWN OF CHERRY FORK @ PAINT RD.	7.5	9.8	IP	0.054	0.093	0.071
CHERRY FK @ GRACES RUN RD AT HARSHAVILLE	2.61	20.3	IP	0.333	0.075	0.046
GRACE RUN S OF SEAMAN @ ST. RT. 247	1.4	6.3	IP	0.447	1.848	0.102
Buck Run @ Armstrong Rd.	0.38	10.7	WAP	0.176	0.208	0.048
Little West Fork @ Forsythe Rd.	6.26	5.5	WAP	0.473	0.300	0.040
LITTLE WEST FORK S OF SUGAR TREE RIDGE @ SHAW-BAKER RD.	5.7	9.2	IP	0.243	0.138	0.026
LITTLE WEST FORK NW OF SEAMAN @ MOUTH	0.1	22.5	IP	0.025	0.173	0.039
ELK FK @ SR 32 DST WINCHESTER WWTP	1.61	6.7	IP	0.190	0.350	0.059
FLAT RUN SE OF BELFAST, DST. ST. RT. 770	1.1	5.6	IP	0.025	0.050	0.083
Elm Run @ Deadfall Rd.	1.75	6.1	WAP	0.094	0.133	0.024
ELK RUN Ust. Elm Run	1.33	5.2	WAP	0.052	0.050	0.014
ELK RUN NE OF BELFAST @ COSS RD.	0.9	13.9	IP	0.025	0.120	0.045
LOST FORK S OF FOLSOM @ ST. RT. 247	2.5	5.9	IP	0.072	3.025	0.035
LOST FORK SE OF FOLSOM @ PEACH ORCHARD RD.	1.7	12.2	IP	0.041	0.092	0.015
BAKER FORK S OF CYNTHIANA @ DRY BONE RD.	14.8	12.8	IP	0.116	0.485	0.130
BAKER FORK AT FORT HILL RD.	10.5	21	IP	0.034	0.136	0.057
BAKER FK @ HORNER CHAPEL RD	1.49	43	IP	0.037	0.365	0.081
M. FK. BAKER FORK N OF ELMVILLE @ SINKING SPRING RD.	5.4	9.8	IP	0.025	0.075	0.009
M. FK. BAKER FORK NEAR MOUTH @ STRAIT CREEK RD.	0.2	20.3	IP	0.062	0.088	0.018
Moores Run at St. RT. 247	0.2	3.8	WAP	0.025	0.050	0.016
STRAIT CREEK S OF SINKING SPRING @ STRAIT CREEK RD.	0.6	6.1	IP	0.107	0.430	0.017
Muddy Fork @ Frost Road	0.39	6.1	WAP	0.085	1.048	0.246
TRIB. TO LICK FK (RM 4.02) @ FARM LANE	2.8	2.7	IP	19.807	0.127	0.461
TRIB. TO LICK FK (RM 4.02) NE OF WEST UNION @ MOUTH	0.1	8.3	IP	0.042	0.113	0.021
Trib. to Beasley Fork (RM 4.60)	0.17	4.9	WAP	0.025	0.403	0.024
TRIB TO W FK OHIO BRUSH CK (7.38) UPST SEAMAN WWTP	0.8	0.7	IP	0.053	1.060	0.319
SHIMER RUN JUST DST PEEBLES WWTP	2.1	1.4	IP	0.025	0.998	0.396
WEST UNION WWTP OUTFALL TO BEASLEY FK	6.65	0.3	IP	0.117	17.305	4.393
PEEBLES WWTP OUTFALL TO SHIMER RUN	2.2	1.4	IP	0.504	5.908	2.663
SEAMAN WWTP OUTFALL TO TRIB TO W FK OHIO BRUSH CK (7.38)	0.75	0.7	IP	1.396	12.300	4.028
HILLCREST NURSING HOME WWTP TO TRIB TO OHIO BRUSH CK (28.90)	0.1	176	IP	0.034	21.904	7.076

Reference Values for the *Western Allegheny Plateau (WAP) and Interior Plateau (IP) ecoregions*						
Sample type (Drainage area)	Ammonia IP	Ammonia-WAP	Nitrate+Nitrite-N IP	Nitrate+Nitrite-N WAP	Phosphorus – IP	Phosphorus – WAP
Headwater (<20mi^2)	0.064	0.060	0.606	0.606	0.090	0.090
Wading (>20 to <200 mi^2)	0.053	0.060	1.312	1.054	0.200	0.110
Small River (>200 to 1000mi^2)	0.126	0.174	1.879	1.462	0.350	0.160

Recreation Use Assessment

Water quality criteria for determining attainment of recreation uses are established in the Ohio Water Quality Standards (OAC 3745-1-07, Table 7-13) based upon the presence or absence of bacteria indicators in the water column. The indicator organism used for these determinations is the bacterium *Escherichia coli* (*E. coli*).

E. coli bacteria are microscopic organisms that are present in large numbers in the feces and intestinal tracts of humans and other warm-blooded animals. *E. coli* typically comprises approximately 97 percent of the organisms found in the fecal coliform bacteria of human feces (Dufour, 1977), but there is currently no simple way to differentiate between human and animal sources of coliform bacteria in surface waters, although methodologies for this type of analysis are becoming more practicable. These microorganisms can enter water bodies where there is a direct discharge of human and animal wastes, or may enter water bodies along with runoff from soils where these wastes have been deposited.

Pathogenic (disease causing) organisms are typically present in the environment in such small amounts that it is impractical to monitor them directly. *E. coli* bacteria, by themselves, are usually not pathogenic. However, some strains of *E. coli* can be pathogenic, causing serious illness. Although not necessarily agents of disease, *E. coli* may indicate the potential presence of pathogenic organisms that enter the environment through the same pathways. When *E. coli* bacteria are present in high numbers in a water sample, it invariably means that the water has received fecal matter from one source or another. Swimming or other recreational-based contact with water having a high *E. coli* count may result in ear, nose, and throat infections, as well as stomach upsets, skin rashes, and diarrhea. Young children, the elderly, and those with depressed immune systems are most susceptible to infection.

The Ohio Brush Creek basin is designated with the Primary Contact Recreation (PCR) use as defined in OAC Rule 3745-1-07. Water bodies with a designated recreation use of PCR "...are waters that, during the recreation season, are suitable for one or more full-body contact recreation activities such as, but not limited to, wading, swimming, boating, water skiing, canoeing, kayaking, and scuba diving" [OAC 3745-1-07 (B)(4)(b)]. The recreation use water quality criteria applicable to the Ohio Brush Creek basin for the current rule are reported in Table 7-13 of OAC 3745-1-07. Ohio EPA adopted new recreation uses and revised criteria into the Ohio WQS effective 3/15/2010. The new standard is based on *E. coli* only and allows for using all samples of bacteria collected over the entire recreation season (defined as May 1st through October 31st) in calculating the geometric mean. The geometric mean can be based on two or more samples and will be the only basis for attainment status when more than one sample is collected. Applicable criteria vary based on stream use designation and a class category based on observed and potential frequency and intensity of usage. The Ohio Brush Creek watershed is designated as both PCR Class A (portions of Ohio Brush Creek and West Fork Ohio Brush Creek) and PCR Class B (all other streams). Class A is typically reserved for lakes and popular paddling streams and Class B is typically rivers and streams that are wadeable or larger that have the potential for recreational activity.

Bacteria

Elevated bacteria was found in only a few locations. Failing home septic systems and livestock are the most likely sources of bacteria. Drought conditions in 2007 may have also contributed to high bacteria.

Summarized bacteria results for 2007, with a comparison of the prior WQS criteria using both fecal coliform and *E. coli* bacteria with the current standards using E. coli only, are listed in Table 10; the complete dataset is reported in Appendix Table 1. Sixty-two stream locations and four NPDES facilities in the Ohio Brush Creek basin were tested for bacteria levels one to five times, from July 23rd – August 20th, 2007. Evaluation of fecal coliform and *E. coli* results using the old standards revealed that 53 stream locations fully met and 9 locations were in non-attainment of the old criteria. Under the new criteria, based only on *E. coli* bacteria, 41 stream locations fully met and 15 locations were in non-attainment.

The Ohio Brush Creek mainstem fully met the designated Class A PCR use criteria at all sites sampled. Other Ohio Brush Creek tributary locations not attaining the designated recreation use were most likely affected by failing home septic treatment system (HSTS) discharges and/or waste from livestock with free access to the creeks. Bacteria colonies are most likely present in high numbers because of the rural nature of the watershed with few centralized sanitary sewer systems. Bacteria may also be caused from agricultural activities such as pasture land runoff and manure land application.

Drought conditions during 2007 may have also contributed to high bacteria numbers because low flows may have concentrated bacteria counts in pools where samples were collected. Evidence for this contention was available the following year (2008) when *E. coli* bacteria samples were collected at twelve locations and only one location was in non-attainment of the applicable PCR criteria (Table 11).

Table 10. A summary of fecal coliform and *E. coli* data for 66 locations sampled in the Ohio Brush Creek Basin, July 23 – August 20, 2007. Recreation Use (RU) was determined using criteria from both the previous WQS rule and current rule (Ohio Administrative Code 3745-1-07, Table 7-13), which became effective March 15, 2010. The old rule compares the geometric mean and 90th percentile of *E. coli* and fecal coliform bacteria values to the Primary Contact Recreation (PCR) criteria. The criteria of the new rule is based on both use designation and stream class and only uses the geometric mean *E. coli* values for 2 or more samples. If only one sample is available, then the maximum criterion is used. All values are expressed in colony forming units (cfu) per 100 ml of water.

			Fecal coliform		*E. coli*		RU Status Previous Rule	RU Status Current Rule
Location	River Mile	#	Geometric Mean	Maximum Value	Geometric Mean	Maximum Value		
Ohio Brush Creek at Deadfall Road	54.70	4	44	280	26	120	FULL	FULL
Ohio Brush Creek at Peach Orchard Rd	52.49	4	62	270	33	70	FULL	FULL
Ohio Brush Creek dst Elk Run	47.16	4	91	290	51	250	FULL	FULL
Ohio Brush Creek Heron Rd	45.14	4	12	40	5	5	FULL	FULL
Ohio Brush Creek at SR 73 near Serpent Mound [a]	40.40	4	8	20	5	5	FULL	FULL
Ohio Brush Creek dst Shimmer Run [a]	30.50	4	157	270	90	200	FULL	FULL
Ohio Brush Creek adj. Lawshe Road [a]	25.00	4	31	40	12	40	FULL	FULL
Ohio Brush Creek at Fawcett Road [a]	21.35	4	40	150	52	100	FULL	FULL
Ohio Brush Creek at end of TR 84 [a]	15.20	4	12	40	7	20	FULL	FULL
Ohio Brush Creek at SR 348 USGS gage [a]	13.16	4	24	110	14	50	FULL	FULL
Ohio Brush Creek at SR 125 [a]	10.00	4	13	30	12	30	FULL	FULL
Ohio Brush Creek dst Beasley Fork[a]	6.00	5	34	140	28	160	FULL	FULL
Ohio Brush Creek at US Rt. 52[a]	0.50	5	32	130	14	90	FULL	FULL
W. Fk. Ohio Brush Cr. at Heaton Rd.	20.53	4	90	600	49	360	FULL	FULL
W. Fk. Ohio Brush Cr. @ Melblanc Rd.	17.92	4	79	740	73	540 [b]	FULL	FULL
W. Fk. Ohio Brush Cr. dst Turkey Run	15.60	4	552	1200	365	630 [b]	FULL	NON[c]
W. Fk. Ohio Brush Cr. at CR 37	12.74	4	166	500	41	330	FULL	FULL
W. Fk. Ohio Brush Cr. upstream Little W. Fk.	10.50	4	215	300	104	220	FULL	FULL
W. Fk. Ohio Brush Cr. at SR 32 (Seaman) [a]	6.10	4	113	230	29	40	FULL	FULL
W. Fk. Ohio Brush Cr. dst Georges Creek [a]	1.10	4	95	1100	39	1100 [b]	FULL	FULL
W. Fk. Ohio Brush Cr. at Peterson Rd [a]	0.37	4	35	130	19	60	FULL	FULL
Lost Fork at SR 247	2.50	4	107	430	41	240	FULL	FULL
Lost Fork at Peach Orchard Rd.	1.70	4	204	270	116	180	FULL	FULL
Elk Run upstream Elm Run	1.33	4	192	940	87	460	FULL	FULL
Elk Run at Coss Rd	0.90	4	54	250	34	140	FULL	FULL
Elm Run at Deadfall Rd.	1.75	4	512	3400 [b]	347	1700 [b]	NON[c]	NON[c]
Muddy Fork at Frost Rd.	0.39	4	1736	2400[b]	1490	2100 [b]	NON[c]	NON[c]
Baker Fork at Dry Bone Rd	14.80	4	397	1700	168	1000 [b]	FULL	NON[c]

Table 10. continued.

Location	River Mile	#	Fecal coliform Geometric Mean	Fecal coliform Maximum Value	*E. coli* Geometric Mean	*E. coli* Maximum Value	RU Status Previous Rule	RU Status Current Rule
Baker Fork at Fort Hill Rd	10.50	4	317	390	195	320	FULL	NON[c]
Baker Fork at Horner Chapel Rd	1.49	4	128	310	77	130	FULL	FULL
Strait Creek at Strait Creek Rd	0.60	4	490	2500[b]	237	1700[b]	NON[c]	NON[c]
Middle Fk. Baker Fk. at Sinking Spring Rd.	5.40	4	501	970	278	530[b]	FULL	NON[c]
Middle Fk. Baker Fk. Straight Creek Rd.	0.20	4	26	100	18	50	FULL	FULL
Crooked Creek upstream SR 73	2.20	4	139	330	48	230	FULL	FULL
Little East Fork at SR 74 NW of Peebles	0.90	4	66	290	20	170	FULL	FULL
Little East Fork at mouth	0.10	4	167	470	114	370	FULL	FULL
Shimmer Run dst Peebles WWTP	2.18	4	265	3000[b]	213	2000[b]	NON[e]	NON[e]
Elk Fork at SR 32 dst Winchester WWTP	1.61	4	294	800	124	550[b]	FULL	FULL
Little West Fork at Forsythe Rd.	6.26	3	433	510	241	400	FULL	NON[c]
Little West Fork at Shaw-Baker Rd	5.70	4	177	980	98	780[b]	FULL	FULL
Little West Fork NW of Seaman at mouth	0.10	4	250	640	129	390	FULL	FULL
Buck Run at Armstrong Rd.	0.38	4	268	700	147	580[b]	FULL	FULL
W. Fk. OBC Trib (7.38) upt Seaman WWTP	0.80	4	797	2100[b]	396	1500[b]	NON[c]	NON[c]
Cherry Fork at St. Rt. 136	8.74	4	1311	2000	461	2000[b]	FULL	NON[c]
Cherry Fork at Paint Rd	7.50	3	369	760	101	130	FULL	FULL
Cherry Fork at Grace Run Rd	2.61	4	78	550	52	310	FULL	FULL
Grace Run at SR 247	1.40	4	3413	21000[b]	1832	22000[b]	NON[c]	NON[c]
Georges Creek at SR 247	3.20	4	416	2300[b]	203	1100[b]	NON[c]	NON[c]
Georges Creek at mouth	0.10	4	98	340	57	140	FULL	FULL
Bundle Run off SR 781	0.68	1	20	20	10	10	FULL	FULL
Lick Fork NE of West Union	4.10	4	60	420	39	150	FULL	FULL
Lick Fork upstream Vaughn Ridge Rd	1.03	4	96	3000[b]	81	1800[b]	NON[c]	FULL
Trib to Lick Fork at Unity Rd	2.80	4	5641	60000[b]	3530	80000[b]	NON[d]	NON[d]
Trib to Lick Fork at SR 41 near West Union	0.10	4	204	870	125	630[b]	FULL	FULL
Cave Run off Cave Run Rd.	0.10	4	195	950	113	770[b]	FULL	FULL

Table 10. continued.

Location	River Mile	#	Fecal coliform		*E. coli*		RU Status Previous Rule	RU Status Current Rule
			Geometric Mean	Maximum Value	Geometric Mean	Maximum Value		
Treber Run at SR 41	0.10	4	17	20	12	40	FULL	FULL
Cedar Run upst Starley-Gustin Rd (TR 58A)	0.38	3	206	360	83	130	FULL	FULL
Beasley Fork adj SR 247 Dst West Union WWTP	4.60	3	336	570	168	280	FULL	NON[c]
Beasley Fork adj SR 247	3.20	5	113	280	44	130	FULL	FULL
Beasley Fork at ford near mouth	0.75	4	159	370	81	200	FULL	FULL
Trib to Beasley Fork at RM 4.60	0.17	5	157	780	69	410	FULL	FULL
Moores Run at SR 247	0.20	5	42	150	23	100	FULL	FULL
Peebles WWTP	*2.20*	*4*	*186*	*60000*	*121*	*57000*	*NA*	*NA*
Hillcrest Nursing Home(Lawshe)	*0.10*	*5*	*7*	*10*	*5*	*5*	*NA*	*NA*
Seaman WWTP	*0.75*	*4*	*317*	*570*	*67*	*230*	*NA*	*NA*
West Union WWTP	*6.65*	*4*	*32*	*1100*	*20*	*580*	*NA*	*NA*

Statewide numerical criteria for Primary Contact Recreation use

Previous Rule[e] at least one of the two bacteriological standards (fecal coliform or *E. coli*) must be met		
	Geometric Mean	Maximum Value
Fecal Coliform	1000	2000
E. Coli	126	298

Current Rule[b] based only on *E. coli* and the stream class			
	Class A (lakes and popular paddling streams)	Class B (most streams not class A or C)	Class C (infrequent recreation)
Geometric mean	<126	< 161	< 206
Maximum Value	≤ 298	≤ 523	≤ 940

a -Ohio Brush Creek and West Branch are designated PCR Class A streams in these locations because they are considered popular paddling streams. All other streams in the table are designated PCR Class B.

b - For the current rule, the attainment status is determined based on geometric *E. coli* bacteria mean except at locations with only one sample. At such locations, attainment is determined based on the single sample maximum. For the previous standards, attainment status is determined based on a geometric mean of 5 samples collected in a 30 day period. If 5 samples in a thirty day period are not available, then attainment status is based on the maximum value.

c - Source of non-attainment from either failing home septic treatment systems or farming activity.

d - Source of non-attainment due to no flow conditions.

e - Source of non-attainment on Shimmer Run due to Peebles WWTP.

Table 11. A summary of *E. coli* bacteria data from 12 locations sampled in the Ohio Brush Creek basin, May 22 – August 13, 2008. Attainment based on comparing the geometric mean, when more than one sample collected, to the Primary Contact Recreation (PCR) criteria of the existing standard (Ohio Administrative Code 3745-1-07, Table 7-13). All values are expressed in colony forming units (cfu) per 100 ml of water.

Site #	Location	River Mile	#	Geometric Mean	Maximum Value	Recreation Use Attainment Status	Source of Bacteria
Class A (lakes and popular paddling streams) – Geometric Mean < 126 Maximum Value ≤ 298							
1	Ohio Brush Creek	40.4	6	37	400*	FULL	NA
2	Ohio Brush Creek	25	7	35	500*	FULL	NA
3	Ohio Brush Creek	13.16	7	24	700*	FULL	NA
4	W. Fk. Ohio Brush Cr	12.74	7	39	200	FULL	NA
5	W. Fk. Ohio Brush Cr	0.37	7	68	220	FULL	NA
Class B – Geometric Mean < 161 Maximum Value ≤ 523							
6	Little West Fork	0.1	7	88	1800*	FULL	NA
7	Baker Fork	10.5	7	318	550*	**NON**	Farming activity/Failing HSTS
8	Baker Fork	1.49	7	114	720*	FULL	NA
9	Middle Fk. Baker Fk.	0.2	7	61	430	FULL	NA
10	Cherry Fork	2.61	7	38	450	FULL	NA
11	Lick Fork	1.03	7	44	350	FULL	NA
12	Trib to Lick Fork	0.1	7	61	500*	FULL	NA

Sediment Quality

Sediment samples were collected from 13 locations in the Ohio Brush Creek study area by the Ohio EPA in August, 2007 (Table 12). Samples were analyzed for metals, volatile organic compounds, semivolatile organic compounds, organochlorinated pesticides, PCBs, nutrients, TOC, and particle size. Specific chemical parameters tested and results are listed in Appendix Tables 4 and 5. Sediment data were evaluated using guidelines established in Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems (MacDonald et.al. 2000), and Ohio Specific Sediment Reference Values (SRVs) for metals (Ohio EPA 2008). The consensus-based sediment guidelines define two levels of ecotoxic effects. A Threshold Effect Concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed, and is comparable to background conditions. A Probable Effect Concentration (PEC) indicates a level above which harmful effects are likely to be observed.

Sediment samples were sampled by focusing on depositional areas of fine grain material (silts and clays). These areas typically are represented by higher contaminant levels, compared to sands and gravels. All sediment sampling occurred in areas along the stream bank, which were represented by sparse deposits of fine grained material. These near bank areas comprised only a small fraction of the bottom substrates of the streams surveyed. Bottom substrates at sediment sites were dominated by gravel and cobble material. Organic chemical parameters were tested at all 13 sampling locations – sampling locations are noted in Table 8. All organic chemicals were reported as not detected.

Select detectable levels of metals are presented in Table 12. Values above ecological screening guidelines are noted with various colors of shading. One location on the West Fork of Ohio Brush Creek had an arsenic concentration above the Probable Effect Concentration (PEC) as well as chromium, and iron values above the Sediment Reference Values. Arsenic, iron, mercury, nickel, and zinc were also found in Ohio Brush Creek at levels above the Threshold Effect Concentration (TEC) or the Sediment Reference Value. Values above the PEC may have a harmful effect on the biological community; however, these elevated sediment metals conditions did not negatively correlate with co-located biological sampling results. Exceptional biological integrity was documented in Ohio Brush Creek and the West Fork of Ohio Brush Creek. The sparse deposits of fine grained material at each sampling site contributed to low exposure levels of the biological communities to sediment contaminants.

Table 12. Chemical parameters measured above screening levels in sediment samples collected in the Ohio Brush Creek study area, 2007. Contamination levels were determined for parameters using consensus-based sediment quality guidelines (MacDonald et.al. 2000). Sediment reference values are listed in the Ohio EPA Ecological Risk Assessment Guidance (revised 2008). Shaded numbers indicate values above the following: Probable Effect Concentration – PEC (red), Threshold Effect Concentration -TEC (yellow), and Sediment Reference Value (orange). Sampling locations are indicated by stream and river mile (RM).

Stream	River Mile	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc
Ohio Brush	45.1	NA	NA	<19	<6.2	16200	8.41**J**	0.165	<25	21.6
Ohio Brush	40.4	NA	NA	<21	14.3	42600	23.7	<0.035	<28	114
Ohio Brush	25.0	16.3	0.108	<15	5.3	23500	13.5	0.147	<20	34.4
Ohio Brush	15.2	11.4	0.13	<19	7.5	19900	12.3	0.025	<26	38.6
Ohio Brush	13.2	12.5	0.168	13	9.9	23600	19	0.033	16	51.5
W. Fk. Ohio Brush Creek	12.7	4.15	<0.099	17	14.7	23700	6.47	<0.031	21	54.3
W. Fk. Ohio Brush Creek	1.1	45.9	0.26	31	8	55500	22.4	<0.025	<23	37.7
W. Fk. Ohio Brush Creek	0.4	7.87	<0.12	<18	8.3	18400	12.9	0.041	<24	33.2
Baker Fork	1.5	13.1	1.71	<39	16.8	23400	22.1	<0.047	<52	162
Cherry Fork	2.6	10.2	<0.214	<32	11.3	24600	13.9	<0.069	<43	75.5
Lick Fork	1.0	NA	NA	18	11.5	48100	14.8	<0.025	<22	43.2
Treber Run	0.1	NA	NA	<25	10.9	26800	12.1	<0.042	<33	50.8
Little East	0.9	NA	NA	23	21.7	27300	8.01	0.446	27	58.4

J - The analyte was positively identified, but the quantitation was below the reporting limit (RL).
< - Not detected at or above the method detection limit (MDL value reported with the less than symbol).

Physical Habitat for Aquatic Life

The assessment of the influence of physical stream features and riparian conditions on ambient biological performance for the Ohio Brush Creek basin will proceed in a longitudinal manner (upstream to downstream). The discussion of tributaries will either be treated in the aggregate, or if sufficiently large, tributaries or sub-basins will be broken-out separately for discussion. For the purposes of continuity, this longitudinal reporting structure will also be applied to the assessment of ambient biological performance throughout this document.

Ohio Brush Creek

As part of the 2007 fish sampling effort, the quality of near and in-steam macrohabitats of the Ohio Brush Creek mainstem were evaluated at 12 sampling locations, assessing approximately 55 miles of the mainstem between RM 54.7 (Deadfall Rd.) and RM 0.5 (US 52). QHEI values ranged between 84.5 and 57.0, with a mean score of 73.4 (±9.34 SD). A matrix of QHEI macrohabitat features, by stations, and the longitudinal performance of the QHEI for Ohio Brush Creek are presented in Table 13 and Figure 8.

Mean QHEI values from rivers or river segments equal to or greater than 60.0 generally indicate a level of macrohabitat quality sufficient to support an assemblage of aquatic organisms fully consistent with the WWH aquatic life use designation. Reach average values at greater than 75.0 are generally considered adequate to support fully exceptional (EWH) communities (Rankin 1989 and Rankin 1995). Values between 55 and 45 indicate limiting components of physical habitat are present and may exert a negative influence upon ambient biological performance. However, due to the potential for compensatory stream features (e.g., strong ground water influence) or other watershed variables, QHEI scores within this range do not necessarily exclude WWH or even EWH assemblages. Values below 45 indicate a higher probability of habitat derived aquatic life use impairment, but should not be viewed as determinant.

By and large, the channel configuration of the mainstem appeared in a natural state, displaying adequate sinuosity and development. Dominant substrates were coarse, consisting of a mixture of native limestone, dolomite, shale, sandstone, and tills, and were generally unencumbered with extensive deposits of clayey silts. Riparian areas at most sites were vegetated, more often wooded, attenuating sunlight and providing in-stream structure in the form of woody debris and rootwad formations.

As measured by the QHEI, the quality of near and in-stream macrohabitat through the length of Ohio Brush Creek appeared capable of supporting diverse, functionally organized, and well-structured assemblages of aquatic organisms, consistent with its existing EWH aquatic life use. Most sites contained an adequate compliment of positive channel, substrate, and riparian features, displaying form and function representative of the complex physiography and geology of the Interior Plateau ecoregion, as found in southwestern Ohio.

Table 13. A matrix of macrohabitat features and QHEI scores for the Ohio Brush Creek study area, 2007.

			WWH Attributes														MWH Attributes																							
																	High Influence					*Moderate Influence*																			
Key QHEI Components			No Channelization or Recovered	Boulder, Cobble, Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/Heavy Silt Cover	Extensive/Moderate Cover	Fast Current, Eddies	Low/Normal Overall Embeddedness	Max Depth > 40 cm	Low/Normal Riffle Embeddedness					Channelization/No Recovery	Silt/Muck Substrates		No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (MD, HW)			Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle			
River Mile	QHEI	Gradient (ft/mile)														**Total WWH Attributes**							**Total HJ, MWH Attributes**																	**Total MJ, MWH Attributes**	**(MWH HJ+1)/(WWH+1) Ratio**	**(MWH MJ+1)/(WWH+1) Ratio**
(10-200) Ohio Brush Creek																																								
Year: 2007																																								
54.7	67.0	28.57	■				■	■		■	■					5							0				•			•				•				3	0.17	0.67
52.5	73.0	9.30	■	■		■	■	■		■	■					7							0		•		•			•				•				4	0.13	0.63
47.2	57.0	11.24	■							■	■					3					♦		1		•		•	•		•		•		•				6	0.50	2.00
44.9	66.5	11.70	■			■	■	■		■	■					6					♦		1		•		•	•		•		•		•				6	0.29	1.14
40.4	74.5	9.17	■	■		■	■	■		■	■					7							0		•					•		•		•				4	0.13	0.63
30.4	79.5	11.49	■	■		■	■	■		■	■	■				8							0		•					•		•	•					4	0.11	0.56
24.8	81.0	5.14	■	■		■				■	■	■				6					♦		1		•				•			•						4	0.29	0.86
21.4	84.5	6.06	■	■		■		■			■	■				6							0		•				•			•						4	0.14	0.71
15.2	79.5	3.91	■	■		■	■	■			■	■				7							0		•		•					•						4	0.13	0.63
10.4	83.0	3.82	■	■		■	■	■	■		■	■				8					♦		1		•								•					2	0.22	0.44
6.0	77.5	4.05	■	■		■	■	■			■					6							0		•							•		•		•		4	0.14	0.71
0.5	58.0	0.10	■	■							■					3					♦		1		•		•	•		•		•		•		•		6	0.50	2.00
(10-205) Beasley Fork																																								
Year: 2007																																								
4.7	66.0	42.55	■			■	■				■	■				5				♦	♦		2		•					•		•						3	0.50	1.00
3.2	60.0	52.63	■	■			■	■		■	■	■				7					♦		1	•	•		•			•		•						5	0.25	0.88
0.8	81.5	13.21	■	■		■	■	■		■	■	■				8							0									•						1	0.11	0.22
(10-206) Moore Run																																								
Year: 2007																																								
0.2	52.5	66.67	■	■		■	■			■	■					6				♦	♦		2				•		•		•		•				•		4	0.43	1.00
(10-209) Cedar Run																																								
Year: 2007																																								
0.4	74.0	14.71	■	■		■	■	■			■	■				7							0		•							•		•				3	0.13	0.50
(10-211) Lick Fork																																								
Year: 2007																																								
4.3	63.0	50.00	■			■	■			■	■					5					♦		1		•							•		•		•		4	0.33	1.00
0.7	72.0	10.70		■			■				■	■				4					♦		1	•	•		•	•				•		•				6	0.40	1.60
(10-212) Treber Run																																								
Year: 2007																																								
0.1	59.5	30.77	■	■		■	■			■	■					6					♦		1				•					•				•		3	0.29	0.71
(10-213) Cave Run																																								
Year: 2007																																								
0.1	59.0	57.14	■	■			■			■	■					5					♦		1				•					•				•		3	0.33	0.83

Table 13. continued.

			WWH Attributes											MWH Attributes																		
														High Influence					*Moderate Influence*													
Key QHEI Components			No Channelization or Recovered	Boulder, Cobble, Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Gradient	Extensive/Moderate Cover	Fast Current, Eddies	Low Normal Overall Embeddedness	Max Depth > 40 cm	Low Normal Riffle Embeddedness		Channelization or No Recovery	Silt, Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (MD, HW)		Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle			
River Mile	QHEI	Gradient (ft/mile)											Total WWH Attributes						Total MWH Attributes													Total MWH Attributes	(MWH HJ+1)/(WWH+1) Ratio	(MWH MJ+1)/(WWH+1) Ratio
(10-215) Trib. to Lick Fork (RM 4.02)																																		
Year: 2007																																		
2.8	43.5	28.40	■	■									2			♦	♦	♦	3		•			•		•	•	•	•	•	•	8	1.33	4.00
0.2	56.5	46.51	■	■			■			■	■		5				♦		1					•			•			•	3	0.33	0.83
(10-216) Little East Fork																																		
Year: 2007																																		
0.9	68.0	36.36	■	■		■	■			■	■	■	7				♦		1		•			•			•		•			4	0.25	0.75
0.4	57.5	44.44	■	■						■	■	■	5			♦	♦		2					•			•				2	0.50	0.83
(10-218) Crooked Creek																																		
Year: 2007																																		
2.2	67.5	7.72	■	■		■	■	■		■	■		7						0	•	•						•		•	•		5	0.13	0.75
(10-220) West Fork Ohio Brush Creek																																		
Year: 2007																																		
20.5	48.5	43.48	■	■							■		3			♦	♦		2		•			•			•		•		•	5	0.75	2.00
17.9	79.0	20.00	■	■		■	■	■			■	■	7						0		•						•		•			3	0.13	0.50
15.2	61.0	18.87	■	■		■	■			■	■		6				♦		1		•						•		•		•	4	0.29	0.86
12.7	64.5	18.35	■			■	■	■		■	■		6				♦		1		•			•			•		•		•	5	0.29	1.00
10.5	65.5	19.05	■	■		■	■	■		■	■		7				♦		1		•						•		•		•	4	0.25	0.75
6.1	67.0	19.05	■			■		■			■		4				♦		1		•			•	•		•		•		•	6	0.40	1.60
1.1	70.5	7.60	■			■	■	■			■		5				♦		1		•						•		•		•	4	0.33	1.00
(10-222) Georges Creek																																		
Year: 2007																																		
3.2	58.0	26.32	■	■		■	■				■		5			♦	♦		2		•						•		•		•	4	0.50	1.17
0.1	71.5	42.55	■	■		■	■	■		■	■	■	8						0		•			•			•		•			4	0.11	0.56
(10-224) Cherry Fork																																		
Year: 2007																																		
8.7	51.5	7.87	■	■			■			■			4			♦	♦	♦	3		•			•			•		•		•	5	0.80	1.80
7.5	52.5	28.57	■			■	■				■		4			♦	♦		2		•			•			•		•		•	5	0.60	1.60
2.6	51.5	22.47	■				■				■		3				♦		1		•			•			•		•		•	5	0.50	1.75
(10-225) Grace Run																																		
Year: 2007																																		
1.3	31.5	28.99									■		1	♦	♦	♦	♦		4	•	•			•			•		•		•	6	2.50	5.50
(10-228) Buck Run																																		
Year: 2007																																		
0.4	63.0	26.32	■	■		■	■				■		5			♦	♦		2		•			•			•		•		•	5	0.50	1.33

Table 13. continued.

Key QHEI Components			WWH Attributes													MWH Attributes																	
																High Influence				Moderate Influence													
River Mile	QHEI	Gradient (ft/mile)	No Channelization or Recovered	Bruce, Cobble, Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Gradient	Extensive/Moderate Cover	Fast Current/Eddies	Low/Normal Overall Embeddedness	Max Depth > 40 cm	Low/Normal Riffle Embeddedness	Total WWH Attributes	Channelization/Recovering	Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (MD, HM)	Total HI. MWH Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	Total MI. MWH Attributes	(MWH HI.+1)/(WWH+1) Ratio	(MWH MI.+1)/(WWH+1) Ratio
(10-229) Little West Fork																																	
Year: 2007																																	
6.3	56.5	37.04	■					■			■		3				♦	♦	2		•		•			•		•		•	5	0.75	2.00
5.7	57.5	40.00	■			■	■			■	■		5				♦	♦	2				•			•				•	3	0.50	1.00
0.1	53.5	18.93	■	■			■	■			■		5					♦	1		•		•		•	•		•		•	6	0.33	1.33
(10-230) Elk Fork																																	
Year: 2007																																	
1.6	68.5	21.05	■	■		■	■			■	■		6					♦	♦	2		•						•		•		4	0.43	1.00
(10-233) Elm Run																																	
Year: 2007																																	
1.8	50.5	19.61	■	■		■	■				■		5				♦	♦	2		•		•		•	•		•		•	6	0.50	1.50
(10-234) Elk Run																																	
Year: 2007																																	
1.4	60.5	16.81	■	■		■	■	■		■	■		7					♦	1				•			•				•	3	0.25	0.63
0.8	51.0	18.87	■	■		■					■		4				♦	♦	2		•		•		•	•		•		•	6	0.60	1.80
(10-237) Lost Fork																																	
Year: 2007																																	
2.5	49.5	13.99	■	■							■		3				♦	♦	2		•		•			•		•		•	5	0.75	2.00
1.7	59.0	13.99	■	■		■	■				■		5						0		•		•			•		•		•	5	0.17	1.00
(10-240) Baker Fork																																	
Year: 2007																																	
14.7	50.5	4.72					■	■			■		3				♦		1	•			•			•		•	•	•	5	0.50	1.75
10.5	71.0	8.70	■	■		■	■	■		■	■	■	8						0		•			•	•	•		•			5	0.11	0.67
1.5	73.5	7.78	■	■		■	■	■		■	■	■	8						0		•		•			•		•			4	0.11	0.56
(10-241) Middle Fork Baker Fork																																	
Year: 2007																																	
5.4	69.5	24.10	■	■		■	■	■		■	■	■	8						0		•					•		•			3	0.11	0.44
0.3	64.0	6.38	■	■		■	■	■			■		6					♦	1		•		•			•		•		•	5	0.29	1.00
(10-245) Strait Creek																																	
Year: 2007																																	
0.8	69.0	16.13	■	■		■	■	■		■	■	■	8				♦		1		•		•			•		•			4	0.22	0.67
(10-246) Muddy Fork																																	
Year: 2007																																	
0.4	58.0	8.77		■			■	■		■		■	5					♦	1	•	•		•			•					4	0.33	1.00

Table 13. continued.

			WWH Attributes											MWH Attributes																	
														High Influence				Moderate Influence													
Key QHEI Components			No Channelization or Recovered	Boulder, Cobble, Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current, Eddies	Low/Normal Overall Embeddedness	Max Depth > 40 cm	Low/Normal Riffle Embeddedness	Total WWH Attributes	Channelization/No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	Total MW Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	Total MW Attributes	(MWH HW+1)/(WWH+1) Ratio	(MWH WD+1)/(WWH+1) Ratio
River Mile	QHEI	Gradient (ft/mile)																															
(10-248) Shimer Run																																	
Year: 2007																																	
0.1	76.5	58.82	■	■		■	■	■		■	■	■	8				♦		1								•				1	0.22	0.33
(10-252) Trib. to Beasley Fork (RM 4.60)																																	
Year: 2007																																	
0.2	61.0	46.51	■			■	■	■		■	■	■	7				♦	♦	2		•		•				•		•		4	0.38	0.88

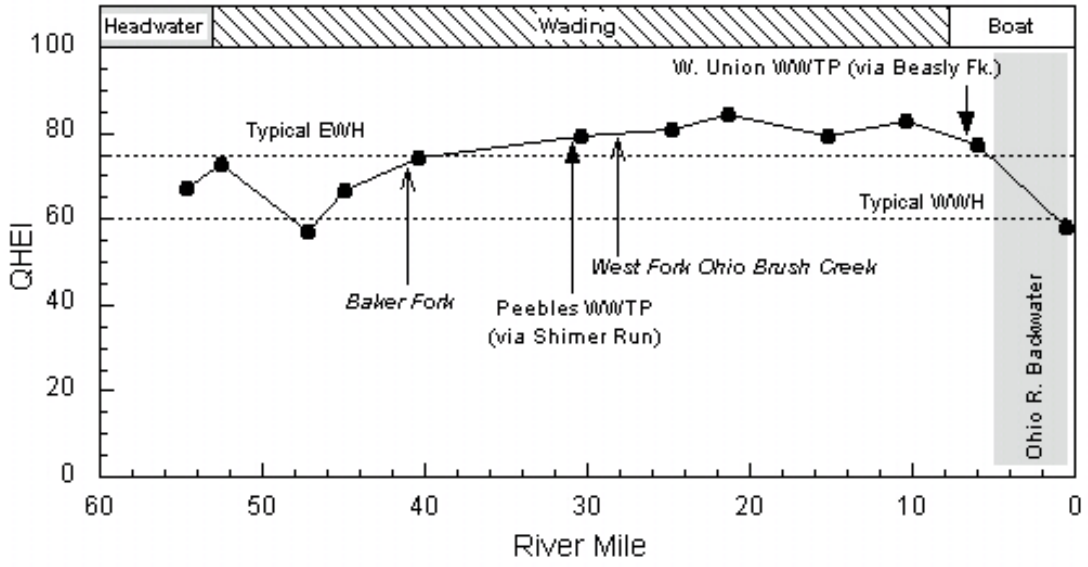


Figure 8. Longitudinal performance of the Qualitative Habitat Evaluation Index (QHEI), Ohio Brush Creek, 2007.

Degraded, diminished or otherwise substandard habitat on the mainstem was limited to two segments, described by three sampling stations. The first reach included adjacent sites at RMs 47.2 (adj. Sider Rd.) and 44.9 (adj. TR 113), representing a transitional reach between the glaciated uplands (Illinoian age) and the unglaciated, eastern half of the basin. The remaining under performing reach included RM 0.5 (US 52), representing the lowest segment of Oho Brush Creek, impounded by the Ohio River. Together, the upper sites (RMs 47.2 and 44.9) yielded QHEI values that ranged between 66.5 and 57.0, and constituted an abrupt departure from both the mainstem average (73.4) and scores from adjacent stations or segments. The lower segment yielded a QHEI of 58.0. Although profoundly degraded macrohabitat was not indicated, these values were significantly below that expected for exceptional waters. Deficient features were common to both upper and lower segments and included limited sinuosity, retarded channel development, inadequate cover, and increased substrate embeddedness (sedimentation). However, causes of the deficient macrohabitat for these two reaches were strongly divergent.

The habitat deficit documented within the upper portion of the basin appeared related to significant loss of surface flow. During the 2007 sampling effort, the entire basin was subjected to a severe drought (Ohio DNR 2007), and as such, nearly every station bore the effects of the basin-wide dewatering. However, conditions observed between RMs 47.2 and 44.9, were decidedly more acute, to the point that the majority of the active channel was largely abandoned, reducing the reach to a series of pools separated by 50 to 75 meters of dry stream bed. Aside from the obvious loss of aqueous habitat, the abandonment of much of the active channel was so complete as to significantly and negatively affect the QHEI. Basic positive habitat features were physically present (de-watered or former riffles, runs, glides, etc.) within the active channel, but were rendered non-functional due to the absence of water. In comparison with other drought-affected waters throughout the study area, it is important to emphasize the acute and atypical nature of the desiccation observed for this segment, particularly in light of both the large drainage upstream of this area (55 mile^2) and greater discharge upstream and downstream from this segment. Perhaps not coincidentally, atypical desiccation of the mainstem through this segment occurred within a physiographic transition between the glaciated uplands and unglaciated lowlands, terminating near the western limits of the Serpent Mound Disturbances, an ancient meteor impact zone (Baranoski et al., 2003). Possibly, surface water from the mainstem is entrained to deep factures (up to 3000 feet) associated with the impact zone, thus locally exacerbating the effects of the severe drought of 2007. Alternatively, surface flows from these two areas may have been captured by and entrained to unrelated karst or pseudo-karst features common to the region (Pavey et al. 2002).

Habitat deficits observed for the lower reach of Ohio Brush Creek (RM 0.5) were similarly monotonous, but due instead to the inundation of lower Ohio Brush Creek by the impounded Ohio River.

Ohio Brush Creek Tributaries

Twenty-five direct and indirect Ohio Brush Creek tributaries were surveyed and assessed as part of the 2007 field sampling effort. Forty-five sampling stations were deployed to

these waters, evaluating the macrohabitat quality of 97 cumulative liner stream miles. QHEI values for these tributaries ranged between 81.5 and 31.5, with a mean score of 61.6 (±9.61 SD). Performance of the QHEI by stream and station are presented in Table 13 and Figures 9 and 10.

As measured by the QHEI, significantly deficit macrohabitat was limited to one waterbody: Grace Run. This stream was evaluated at one location, 1.3 miles upstream from the mouth, at SR 247, and represented one of only two waterbodies within the Ohio Brush Creek basin that were significantly affected by channelization. Physical conditions were further impacted by adjacent and upstream agricultural land use, primarily unrestricted cattle access. Poorly managed pasturage can result in severe bank erosion, sedimentation, and nutrient enrichment. Stream desiccation, common throughout the study area in 2007, very likely served to exacerbate the obvious physical deficits observed on Grace Run. Specific negative channel and substrates features included limited sinuosity, sparse in-stream cover, limited development, and heavy deposits of clayey silts, the latter approaching six to ten inches in depth. In this regard, Grace Run stood alone in the watershed with regards to the extent and magnitude of fine sediment deposits. The paucity of positive habitat features, particularly the heavy siltation and lack of continuous surface flow, yielded a QHEI score well into the poor range (QHEI=31.5). In the absence of mitigating factors (e.g., strong ground water flow, significant hyporheic flow, or nonrepresentative sampling due to conditions observed being highly localized or otherwise anomalous), these results suggested a high probability of habitat related use impairment for lower Grace Run. Other important observations made on Grace Run included algal mats on the surface of the extant pools and a pronounced or otherwise very strong manure odor throughout the reach sampled. These and other observations (namely severe sedimentation) appeared a result of poorly managed pasturage or other agricultural activities upstream.

Other macrohabitat deficits were observed at many streams and stations within the basin, but did not approach the magnitude or share the common antecedents of those observed for Grace Run. Rather, diminished surface flow, a result of the combined effects of drought (Ohio DNR 2007) and the natural tendency of this basin to low summer discharge (Ohio EPA 1989a), clearly depressed QHEI scores for many streams and, more importantly, may have served to limit biological performance in a more meaningful way than that measured by the QHEI alone. However, the effects of both drought and native drainage patterns that gave rise to the observed desiccation were not evenly distributed throughout the Ohio Brush Creek watershed, and instead appeared concentrated in the glaciated (Illinoian age) uplands that form the northwestern portion of the basin. In contrast, and almost without exception, adequate flow and generally intact macrohabitat were found throughout the Ohio Brush Creek tributaries draining the unglaciated portion of the basin (Figures 3 and 11). Mean QHEI scores and the range of observed values between the unglaciated and

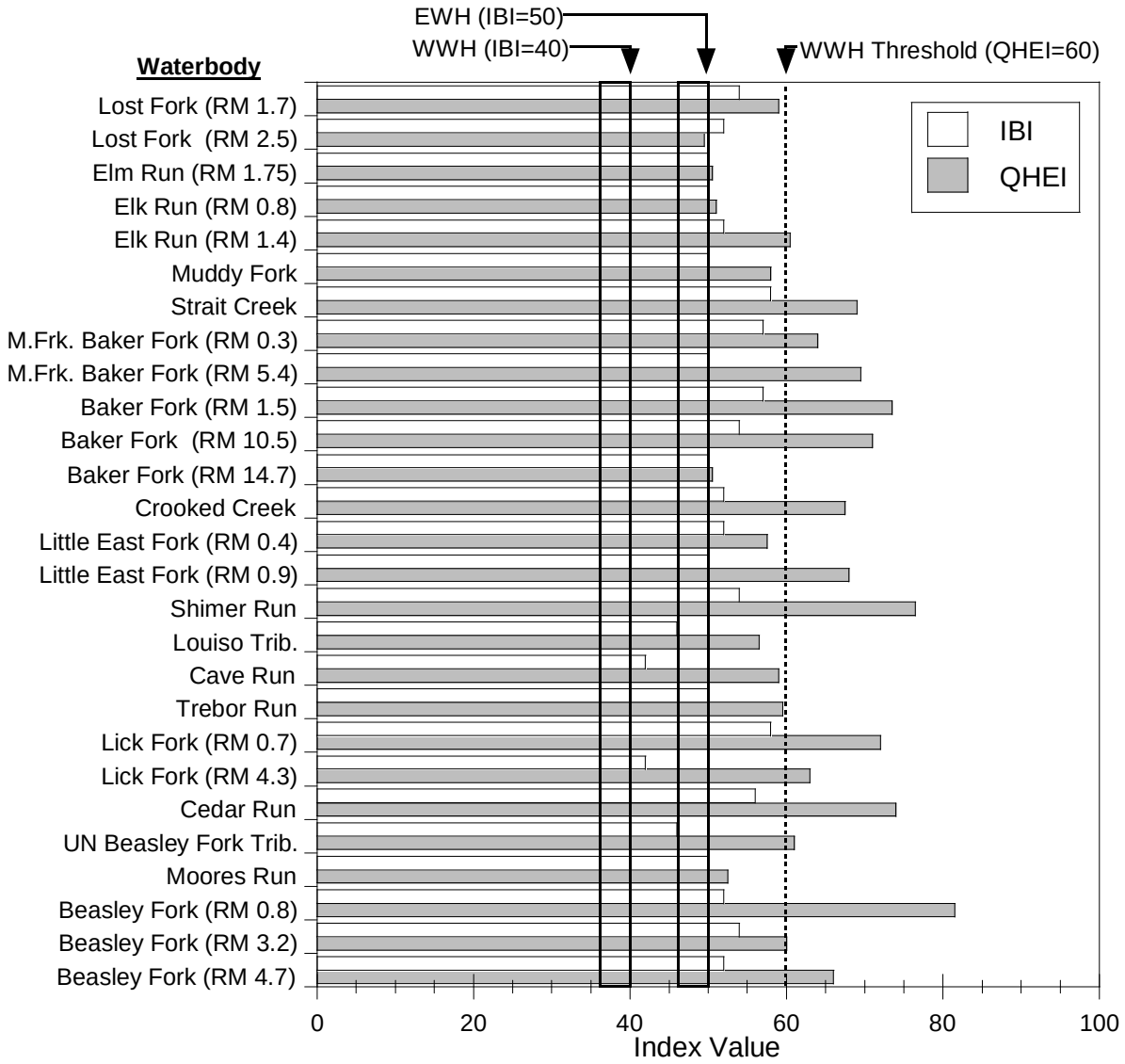


Figure 9. Performance of the Qualitative Habitat Evaluation Index (QHEI) and Index of Biotic Integrity (IBI) for all mainstem tributaries assessed as part of the Ohio Brush Creek survey, 2007. Rectangles indicate the WWH and EWH biocriteria and ranges of non-significant departure. Dashed line indicates typical WWH QHEI score.

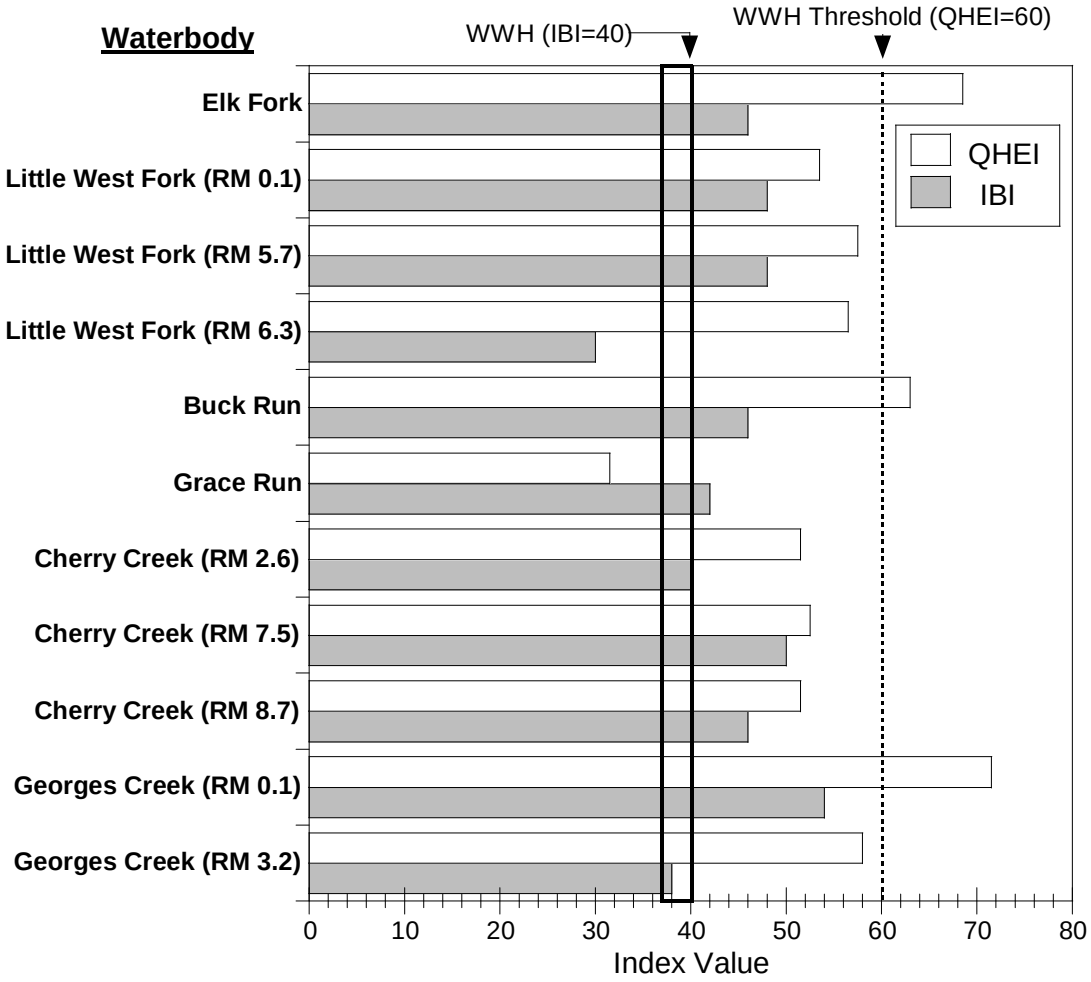


Figure 10. Performance of the Qualitative Habitat Evaluation Index (QHEI) and Index of Biotic Integrity (IBI) for all West Fork Ohio Brush Creek tributaries assessed as part of the Ohio Brush Creek basin survey, 2007. Rectangles indicate the WWH biocriteria and ranges of non-significant departure. Dashed line indicates typical WWH QHEI score.

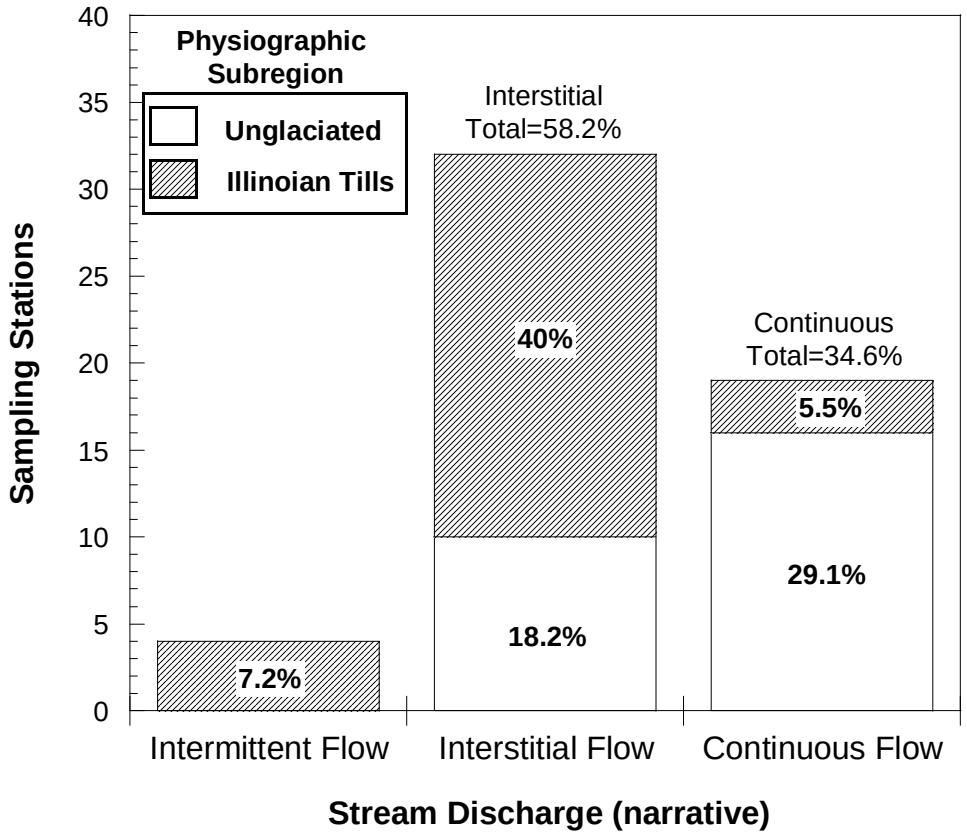


Figure 11. Distribution of narrative stream flow categories by physiographic sub-region [glaciated (Illinoian age) and unglaciated], contained within the Ohio Brush Creek study area, 2007.

glaciated portions of the study area, were 68.3 (±9.60 SD), range 81.5-52.5, for unglaciated streams and 58.8 (±7.82 SD) range 79.0-31.5, for glaciated streams. The difference are largely a result of flow, or lack thereof, and, at times, more intensive agricultural land use (livestock) common to the glaciated portion of the basin. Only one stream, Crooked Creek, displayed surface flow regimes in contrast to this pattern. The relatively small drainage area of this direct Ohio Brush Creek tributary is contained entirely within the unglaciated potion of the basin. Despite Crooked Creek's physiographic disposition, the stream was found ephemeral by mid-summer 2007. This observation was inconsistent with similarly sized tributaries similarly located. Upon further investigation, it became apparent that a portion of Crooked Creek's catchment included the Serpent Mound Disturbance. Furthermore, it appears that the stream's course clearly conforms to the impact zone's southern boundary. Perhaps, as speculated for a short segment of the mainstem, a portion of Crooked Creek's discharge is entrained into the deep fissures associated with this geological disturbance, thus explaining the anomalous water levels observed in comparison to those from similar Ohio Brush Creek basin waterways.

The question of stream desiccation and its effects upon ambient biological performance bears additional discussion, as ephemeral waters can be rationally subdivided into two important and meaningful categories: intermittent and interstitial. Ephemerality, in and of itself, does not necessarily represent a severe or debilitating habitat deficit. On the contrary, there are many statewide examples of ephemeral streams supporting WWH or EWH assemblages, despite a *subpar* QHEI score or the absence of a fully wetted channel, or both. Intermittent or interstitial waters both tend to yield low QHEI scores given absence of flow dependent channel and substrate features (e.g., riffles and runs). However, it is critical to note the distinctions between interstitial flow and true intermittence. The first, interstitial, constitutes a category of streams or stream reaches that during the dry summer months regularly lacks visible surface flow, the wetted channel consisting of a series of pools, separated by dry substrates. The pools are kept from becoming stagnant or septic through inputs of cool subsurface or hyporheic flow. Interstitial streams often do possess continuous flow, it's just not readily apparent, as water is conveyed below and through the streambed. Healthy and intact headwater aquatic faunas are adapted to interstitial conditions, finding the residual pools or subsurface flow more than adequate refugium during periods of drought. In contrast, truly intermittent streams, as a class, are completely desiccated during dry periods or are reduced to a few hydrologically isolated pools. These residual wetted areas, where present, quickly stagnate and are rendered inhospitable to all but the most tolerant and facultative organisms. True intermittency significantly affects the biological potential of a water body, virtually precluding the permanent establishment of a diverse and healthy assemblage of aquatic organisms. Even during periods of abundant surface flow (spring or fall), intermittent stream typically support only transient populations of pioneering species.

Each organism group employed by Ohio EPA to evaluate surface water quality has been found to react in divergent ways to stream desiccation. If the summer flow regime of a given waterbody is interstitial, typically the fish assemblage will perform well, having taken refuge in the residual pools. The monitoring and assessment results for the macrobenthos under the same conditions, however, can vary considerably, but typically yields samples and subsequent evaluations ranging within the fair range; this because many important macrobenthos taxa resort to life history adaptations or behaviors when faced with the loss of the wetted channel and are thus precluded from late summer collections. These behaviors include migration to the the hyporheic zone, accelerated emergence as adults, and diapauses (Lytle and Poff 2004; Harper and Peckarsk 2006). The paucity of accessible benthic macroinvertebrates ultimately results in depressed final community assessments. In contrast, truly intermittent waters (as described above) typically show both depressed fish and benthic macroinvertebrate faunas and commensurate assessments due to the true absence of adequate aqueous habitat. Based upon observations made over the course of the 2007 survey and those proffered in the prior evaluation of Ohio Brush Creek (Ohio EPA 1987), most ephemeral waters appeared interstitial as opposed to intermittent. The extent and magnitude of natural and temporal desiccation were likely heightened by the drought of 2007, and as such, diminished

ambient biological performance. This was particularly evident in the benthic macroinvertebrate community, especially those collected from streams with diminished surface flow draining the Illinoian Till plains. This sub-region contained the majority of ephemeral or otherwise desiccated waters in the Ohio Brush Creek basin.

Biological Assessment of the Macroinvertebrate Community

Macroinvertebrate communities were assessed at 57 sampling locations in the Ohio Brush Creek watershed in 2007. One additional stream, Flat Run, was scheduled for sampling but not assessed because the channel was dry. Qualitative samples from the natural substrates were collected from all sampling locations. Quantitative, artificial substrate samplers were scheduled for deployment at 21 sites (>20 miles^2 and/or regional reference locations). However, most samplers were either not set or not collected due to low stream flows and a lack of adequate current and water depth. As a result, artificial substrates were only retrieved from five Ohio Brush Creek sites and one Baker Fork site. Where quantitative data were lacking, narrative assessments based on the qualitative collections were substituted. A summary of the macroinvertebrate data are presented in Table 14, while ICI metric scores and raw data are presented in Appendix Tables 8-10. Sampling locations were evaluated using either Warmwater Habitat or Exceptional Warmwater Habitat biocriteria.

Ohio Brush Creek watershed sites achieved the applicable WWH/EWH biocriterion at only 31 of 57 sites (54%) evaluated in 2007. Twenty sites were not achieving the WWH biocriteria and six additional sites were not meeting the EWH biocriteria, representing 46% of the watershed sites. Of the 26 impaired sites, 6 were rated good (EWH streams), 19 were of fair quality and one (West Fork Ohio Brush Creek RM 20.5) was rated as poor.

The Ohio Brush Creek mainstem was evaluated at 10 sites between RMs 54.7 and 0.5. The 57.1 mile stream is free-flowing and designated EWH from its source in Highland County to the confluence with Beasley Fork at RM 6.1. Beginning at RM 6.1, the designation changes from EWH to WWH as the creek transitions from a free-flowing to lentic condition in the impounded backwaters reach between Beasley Fork and the Ohio River.

The EWH aquatic life use was met in Ohio Brush Creek at all but two sites on the upper mainstem between RMs 54.7 and 45.1. Extreme low flow conditions and stream intermittence were considered the primary causes of impairment. Beginning downstream from Serpent Mound (RM 39.0) and extending through the remaining 33 mile reach to Beasley Fork (RM 6.1), macroinvertebrate performance fell almost entirely into the exceptional range. Flow conditions through this reach were very low but remained continuous during the sampling period. An abundance of both pollution sensitive and Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa were found in the stretch, averaging 41 and 27 per site, respectively. No significant change or declines in community health were noted until the flooded river mouth near the Ohio River confluence (ICI=12 at RM 0.5). However, current WWH criteria do not apply to these lotic habitats and the poor community composition was considered fairly typical for a deep, silty, impounded habitat.

Table 14. Summary of macroinvertebrate data collected from artificial substrates (quantitative data) and natural substrates (qualitative data) in the Ohio Brush Creek basin, July-September, 2007. Data ranked by narrative evaluation category.

River	RM	Drn. Area	Qual. Total	Qual. Sen.*	Qual. EPT	Density[a]	ICI[b]	Flow	Predominant Populations[c]
Exceptional									
Ohio Brush Cr.	47.16	52.4	51	25	20	Low	--	V. Low	Mayflies (I)
Ohio Brush Cr.	39.00	136.0	72	36	24	Mod.	--	Low	Mayflies, fingernet caddisflies (I)
Ohio Brush Cr.	30.40	174.0	76	39	28	Low	--	Low	Mayflies, caddisflies (I, F); helgramites (I)
Ohio Brush Cr.	21.35	328.0	75	37	23	High	--	Low	Mayflies, caddisflies (I, F); helgramites (I)
Ohio Brush Cr.	15.20	371.0	64	35	27	Mod.	--	V. Low	Mayflies, caddisflies (I, F); riffle beetles (F)
Ohio Brush Cr.	6.00	423.0	61	35	22	1533	48	Low	Mayflies (I)
Elk Run	1.50	5.2	61	24	18	Mod.	--	V. Low	Fingernet caddisflies (I); riffle beetles (F)
Baker Fork	10.50	21.0	50	26	14	1295	48	Moderate	Mayflies (I, F), hydropsychid caddisflies (F)
Baker Fork	1.49	43.0	59	27	17	Mod.	--	V. Low	Mayflies (I)
Strait Cr.	0.60	5.9	47	24	14	Mod.	--	Moderate	Mayflies, caddisflies (I, F)
Cedar Run	0.38	11.1	47	25	24	Mod.	--	Moderate	Fingernet caddisflies, mayflies, (I)
Very Good									
Ohio Brush Cr.	52.50	26.0	55	19	17	Mod.	--	Low	Fingernet caddisflies (I)
Ohio Brush Cr.	24.80	315.0	56	27	24	1446	44	V. Low	Riffle beetles (F); mayflies, caddisflies (I, F)
Ohio Brush Cr.	10.00	396.0	66	35	25	1886	44	Low	Mayflies, caddisflies (I, F); helgramites (I)
Middle Fork Baker Fork	5.40	9.8	57	18	18	Mod.	--	Low	Mayflies, caddisflies (I, F); riffle beetles (F)
Good									
Ohio Brush Cr.	54.70	8.7	57	15	14	Mod.	--	Low	Fingernet caddisflies (I); mayflies, flatworms (F)
Lost Fork	1.70	12.2	38	14	14	High	--	V. Low	Stoneflies (I), hydropsychid caddisflies (F)
Elk Run	0.90	13.9	48	18	14	Mod.	--	V. Low	Fingernail clams (F), stoneflies, caddisflies (I)
Middle Fork Baker Fork	0.30	20.3	47	19	14	Mod.	--	Interstitial	Mayflies (I, F)
Shimer Run	0.10	5.9	36	14	13	Low	--	Low	Mayflies, hydropsychid caddisflies (F)
West Fork Ohio Brush Cr.	15.20	22.7	51	16	13	Mod.	--	V. Low	Riffle beetles (F), water pennies (I)
West Fork Ohio Brush Cr.	12.74	27.3	48	15	15	Mod.	--	V. Low	Riffle beetles (F)
West Fork Ohio Brush Cr.	10.50	38.9	40	17	14	High	--	V. Low	Riffle beetles (F)
West Fork Ohio Brush Cr.	1.10	129.0	49	16	13	High	--	V. Low	Riffle beetles (F)

Table 14. Summary of macroinvertebrate data collected from artificial substrates (quantitative data) and natural substrates (qualitative data) in the Ohio Brush Creek basin, July-September, 2007. Data ranked by narrative evaluation category.

River	RM	Drn. Area	Qual. Total	Qual. Sen.*	Qual. EPT	Density[a]	ICI[b]	Flow	Predominant Populations[c]
Lick Fork	1.03	30.9	41	18	13	Low	--	Low	Riffle beetles, mayflies (F)
Cave Run	0.10	3.8	28	11	12	Low	--	V. Low	Riffle beetles (F)
Beasley Fork	3.20	9.7	31	11	14	Mod.	--	Mod.	Water pennies (I), hydropsychid caddisflies (F)
Beasley Fork	0.75	18.0	37	14	14	High	--	Low	Caddisflies (I, F), mayflies (F)
Trib. to Beasley Fk. (RM 4.6)	0.17	4.9	34	9	12	Low	--	Low	Hydropsychid caddisflies (F), mayflies (I, F)
Marginally Good									
Ohio Brush Cr.	44.90	55.0	32	11	9	Mod.	--	Intermittent	Mayflies (I, F)
Baker Fork	14.80	12.8	45	12	8	Mod.	--	Mod	Baetid mayflies, hydropsychid caddisflies (F)
West Fork Ohio Brush Cr.	6.10	76.0	54	13	12	Mod.	--	V. Low	Fingernet caddisflies (I), flatworms (F)
Buck Run	0.38	10.7	44	11	9	Mod.	--	V. Low	Isopods, Riff. Beetles (F)
Treber Run	0.10	7.2	33	9	8	Low	--	Interstitial	Mayflies, isopods, riffle beetles (F)
Beasley Fork	4.70	3.4	30	7	9	Mod.	--	Mod.	Baetid mayflies, hydropsychid caddisflies (F)
Moore Run	0.40	3.8	27	7	10	Mod.	--	V. Low	Baetid mayflies (F)
Fair									
Lost Fork	2.50	5.9	33	6	6	Mod.	--	Interstitial	Mayflies, red midges (F)
Elm Run	0.60	7.4	39	8	7	Mod.	--	Interstitial	Mayflies, red midges (F)
Muddy Fork	0.39	6.1	45	9	7	Mod.	--	Low	Baetid mayflies, flatworms (F)
Crooked Cr.	2.20	8.3	37	8	6	Mod.	--	Intermittent	Water beetles (T), fingernail clams (F)
Little East Fork	0.90	6.9	27	7	6	Low	--	Interstitial	Mayflies (I, F)
Little East Fork	0.40	10.1	17	5	7	Mod.	--	Intermittent	Burrowing mayflies (I)
West Fork Ohio Brush Cr.	17.92	12.0	49	13	7	Low	--	V. Low	Riffle beetles, red midges (F)
Elk Fork	1.61	6.7	34	3	5	Low	--	V. Low	Scuds, hydropsychid caddisflies (F)
Little West Fork	6.26	5.5	50	10	10	Low	--	Interstitial	Caddisflies (I, F), water beetles (T)
Little West Fork	5.70	9.2	43	8	8	Low	--	Interstitial	Fingernail clams (F)
Little West Fork	0.10	22.5	30	7	7	Mod.	--	Interstitial	Riffle beetles (F)
Cherry Fork	8.74	5.7	27	2	4	Mod.	--	Intermittent	Mayflies (F), red midges (F, T)
Cherry Fork	7.50	9.8	25	6	4	High	--	Intermittent	Water beetles (T), mayflies (F)
Cherry Fork	2.61	20.3	41	8	10	Mod.	--	V. Low	Fingernail clams (F)

Table 14. Summary of macroinvertebrate data collected from artificial substrates (quantitative data) and natural substrates (qualitative data) in the Ohio Brush Creek basin, July-September, 2007. Data ranked by narrative evaluation category.

River	RM	Drn. Area	Qual. Total	Qual. Sen.*	Qual. EPT	Density[a]	ICI[b]	Flow	Predominant Populations[c]
Grace Run	1.40	6.3	30	3	6	Mod.	--	V. Low	Flatworms (F)
Georges Cr.	3.80	5.9	35	7	6	Mod.	--	Interstitial	Mayflies, riffle beetles (F)
Georges Cr.	0.10	12.3	32	8	8	Low	--	V. Low	Riffle beetles (F)
Lick Fork	4.30	7.9	32	6	8	Low	--	V. Low	Isopods, riffle beetles (F)
Trib. to Lick Fk. (RM 4.02)	0.20	8.3	32	5	6	Mod.	--	V. Low	Riffle beetles (F)
Poor									
Ohio Brush Cr.	0.50	435.0	25	3	1	3450	12	Impounded	Midges, zebra mussels (F)
West Fork Ohio Brush Cr.	20.53	4.8	22	1	3	Low	--	Intermittent	Water beetles, snails (T), mayflies (F)

***** Sen. - Sensitive taxa and are those listed on the Ohio EPA macroinvertebrate taxa list as being either Moderately Intolerant (MI) or Intolerant (I).

[a] Observed relative density of the benthos on natural substrates; numbers represent individuals collected per square foot from artificial substrates where quantitative data are available.

[b] Invertebrate Community Index. ICI not available for sampling locations with drainage area <20mi^2 (excluding reference sites) or sites with inadequate depth or current velocity for artificial substrate use.

[c] Predominant taxa are those observed on natural substrates. Tolerance categories for taxa groups are parenthetically expressed: VT = Very Tolerant, T = Tolerant, MT = Moderately Tolerant, F = Facultative, MI = Moderately Intolerant, I = Intolerant.

The 21.5 mile length of the West Fork of Ohio Brush Creek was assessed at seven sites between Heaton Road (RM 20.5) and the mouth (RM 1.1). Macroinvertebrate performance ranged from poor at Heaton Road to good at sites downstream from RM 15.2, but only one achieved the applicable WWH or EWH biocriterion (14% full attainment). Interstitial flows in the West Fork were observed as far downstream as the mouth but the most severe intermittence and macroinvertebrate impairment was found in the headwaters. The lower 15 stream miles were of good quality and included adequate numbers of both pollution sensitive and EPT taxa (mean 15.4 and 13.4 per site, respectively). However, macroinvertebrate performance was not considered near even minimum EWH levels throughout the reach.

At all but one location, impairment in the Ohio Brush Creek basin appeared related to severe, but natural, low flow conditions associated with the extended 2007 drought. Drainage areas for impaired WWH sites averaged 9 square miles (n=19) while the impaired EWH stream sites averaged 56 square miles (n=6). Physically, degraded sites were often characterized by interstitial or even intermittent flow (Figure 12) while performance at nearly all sites with continuous flow met minimum WWH standards (*i.e.* marginally good quality or better).

Drought impacted communities that fell below WWH performance standards were characterized by low total richness, low EPT, and low sensitive taxa richness (means = 33.3, 6.3, and 6.3, respectively). Correspondingly higher numbers of pollution tolerant taxa (mean 7.8) were also found at these sites; tolerant varieties were often associated with excessive enrichment, siltation, or temperature. Impaired EWH designated stream sites contained comparatively greater numbers of EPT and sensitive taxa but performance still fell below EWH standards *(e.g.,* good or marginally good quality).

The large majority of drought impaired sites (81%) were located in the western half of the basin, in Illinoian aged glacial deposits. While the entire Interior Plateau ecoregion is prone to low flow due to the shallow, underlying bedrock, low macroinvertebrate performance was particularly common in the glaciated streams. In addition to low flow, impairment was often exacerbated by siltation and unrestricted cattle access. For example, moderate to heavy siltation was noted at 22 survey sites and 13 were impaired (59%); 12 of those 13 impaired sites (92%) were located within the Illinoian till moraine drainage.

Muddy Fork is a channelized tributary to upper Baker Fork, located in the extreme headwaters of Ohio Brush Creek. The channel was deeply incised and substrates were composed of loose sand and silt. The tributary was the only site where impairment appeared influenced by habitat alteration as opposed to drought.

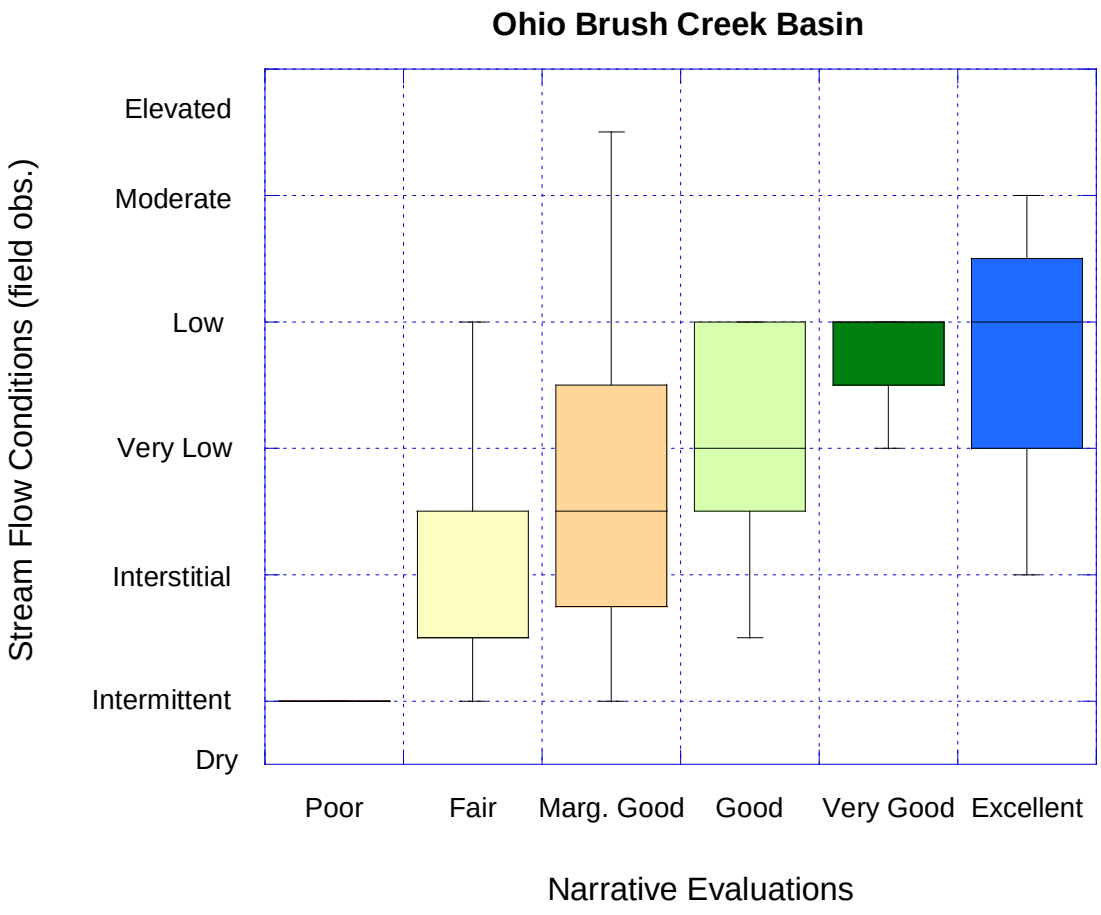


Figure 12. Box and whisker plots of macroinvertebrate community health and corresponding stream flow conditions noted at 56 lotic sampling sites in the Ohio Brush Creek basin, 2007. One Ohio Brush Creek site in the Ohio River backwaters was excluded from the analysis.

The Serpent Mound Disturbance

Despite the pervasive drought conditions during the summer of 2007, the trend of severe stream de-watering and biological impairment was almost entirely restricted to the glaciated portion of the basin. One area that did not fit this trend was a tract of several square miles in the unglaciated section of the basin near the Serpent Mound. In this area, nearby Crooked Creek was the only non-glaciated stream in the study area impaired by low flow. Communities from the lower reaches of Baker Fork and Middle Baker Fork attained their aquatic life use but, based on field observations, flow appeared much lower compared to sites sampled miles upstream. Ohio Brush Creek flow declined from continuous to intermittent between the headwaters at RM 52.5 and RM 44.0, a few miles upstream from

the Serpent Mound area; macroinvertebrate quality declined from exceptional to marginally good in the same reach.

Coupled with observations of altered stream flow in the Serpent Mound area is the presence of an ancient geologic feature that may affect surface volume. The Serpent Mound disturbance (Baranoske, et al., 2003) is the site of an ancient meteor strike that occurred prior to the late Permian era (256 million years ago). The impact zone is near the present day junction of Adams, Highland, and Pike counties and lies roughly between the communities of Sinking Spring, Louden, and Locust Grove. This massive impact and explosion fractured and severely disrupted the local bedrock strata for several thousand feet down and for miles in each direction. Overall, the impact affected a circular area of approximately 20 square miles (5 miles in diameter). Today, ancient cracks and fissures extend as far as 3,000 feet below the surface, some breaching the surface (Johnson, pers. comm.) In addition to the impact zone, much of the upper Ohio Brush Creek basin is riddled with karst features (*i.e.*, sinkholes, swallets, fractures) that could potentially influence stream flow (Figures 13 and 14). The phenomenon of lost flow in the area can be found in local nomenclature as the village of Sinking Spring, immediately to the north, was named for a surface spring that is entrained to the bedrock near the village (Cottingham 1949).

Macroinvertebrate sampling in 2007 was not conducted to specifically evaluate potential influences from the ancient meteor impact or other karst features in the basin. Sampling dates and locations did not follow a strict chronology and, therefore, flow variation from site to site and week to week may have been related to rainfall, drought or other factors. For example, a water pump used for irrigation was also observed on the upper Ohio Brush Creek mainstem between RMs 54.7 and 52.5 so some flow may have been physically removed. Still, the coincidental evidence of altered flow and biological decline near this ancient geologic feature is intriguing and should prompt additional study. A program of intensive, dedicated flow measurements from streams in the area might be one method to confirm or discount the 2007 observations.

Ohio Brush Creek Mussels

For its size and location within Ohio, collection records show Ohio Brush Creek supports a disproportionately diverse mussel fauna including 27 taxa, five of which are presently state endangered; several others are considered rare with special state status (Watters 1988) (Table 15). The presence of the rare and endangered yellow sandshell (*Lampsilis teres*) is of particular significance.

As part of the 2007 Ohio Brush Creek survey macroinvertebrate survey, a cursory search for live or freshly dead freshwater mussel specimens was included during the qualitative, natural substrate collections. Out of 57 total sites, nine mussel species from 15 locations were collected in the basin (Table 16). The Ohio EPA totals did not match historical collection records (27) and did not include state endangered or rare specimens. However, this discrepancy is probably more attributable to the cursory sampling methodology and limited site coverage, rather than a significant change or decline in water quality conditions.

Mussel abundance and species richness was greatest at eight stations in Ohio Brush Creek between Baker Fork and Shimer Run (RMs 39.0-6.0) and from the largest tributary to the mainstem, West Fork Ohio Brush Creek at RM 1.1. An average 5.5 species per site (range 3-5) were found at these locations. In contrast, mussel specimens were absent from all but six of the remaining 49 sampling sites (mostly small drainages) with no more than two species found at any location (mean = 0.1 species/site). Specimens were limited to the most common and widespread Ohio species, including fat mucket, giant floater, and plain pocketbook (one site). Fat mucket and giant floater are particularly ubiquitous and often tolerate small stream sizes, intermittent flow, pooled or impounded habitats, and soft, depositional substrates (Watters et. al 2009). Macroinvertebrate performance at these sites was often impaired by low flow and extensive drought conditions and rarely surpassed good quality.

In contrast, stream characteristics at sites with the greatest mussel richness were very similar and included exceptional biological performance (7 of 8 sites), exceptional biological potential (*i.e.,* an existing EWH aquatic life use designation; 7 of 8 sites), contiguous stream flow (8 of 8 sites), exceptional habitat quality (mean QHEI = 78.8; range 70.5-84.5), and large drainage (mean = 284 sq. miles; range 129-423). Collections from these sites often included more prized specimens associated with larger, free-flowing creeks and rivers, coarse substrates, firm stream bottoms, and low silt deposition (*e.g.,* maple leaf, three ridge, fluted shell, white heelsplitter) (Watters et. al 2009). The high quality mussel sites mirrored the mainstem reach demonstrating the highest level of biological performance and habitat integrity. It is interesting to note the reach began downstream from Baker Fork, despite potential de-watering influences from karst features and the adjacent Serpent Mound disturbance area. In addition to increased stream size, this may be a further reflection of the unique hydrology of Baker Fork and the beneficial effects to Ohio Brush Creek from the sustained ground water flow originating in the headwaters.

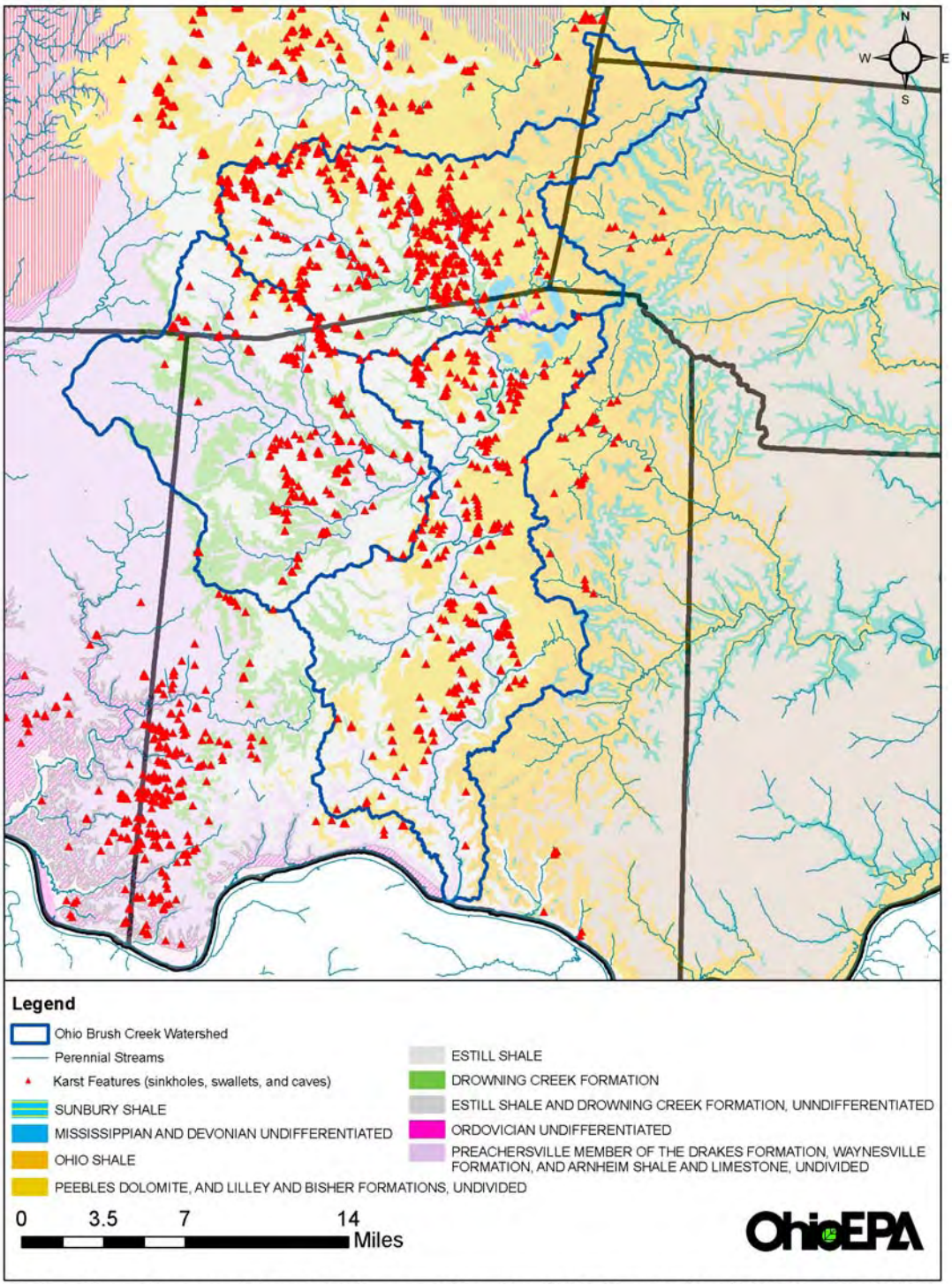
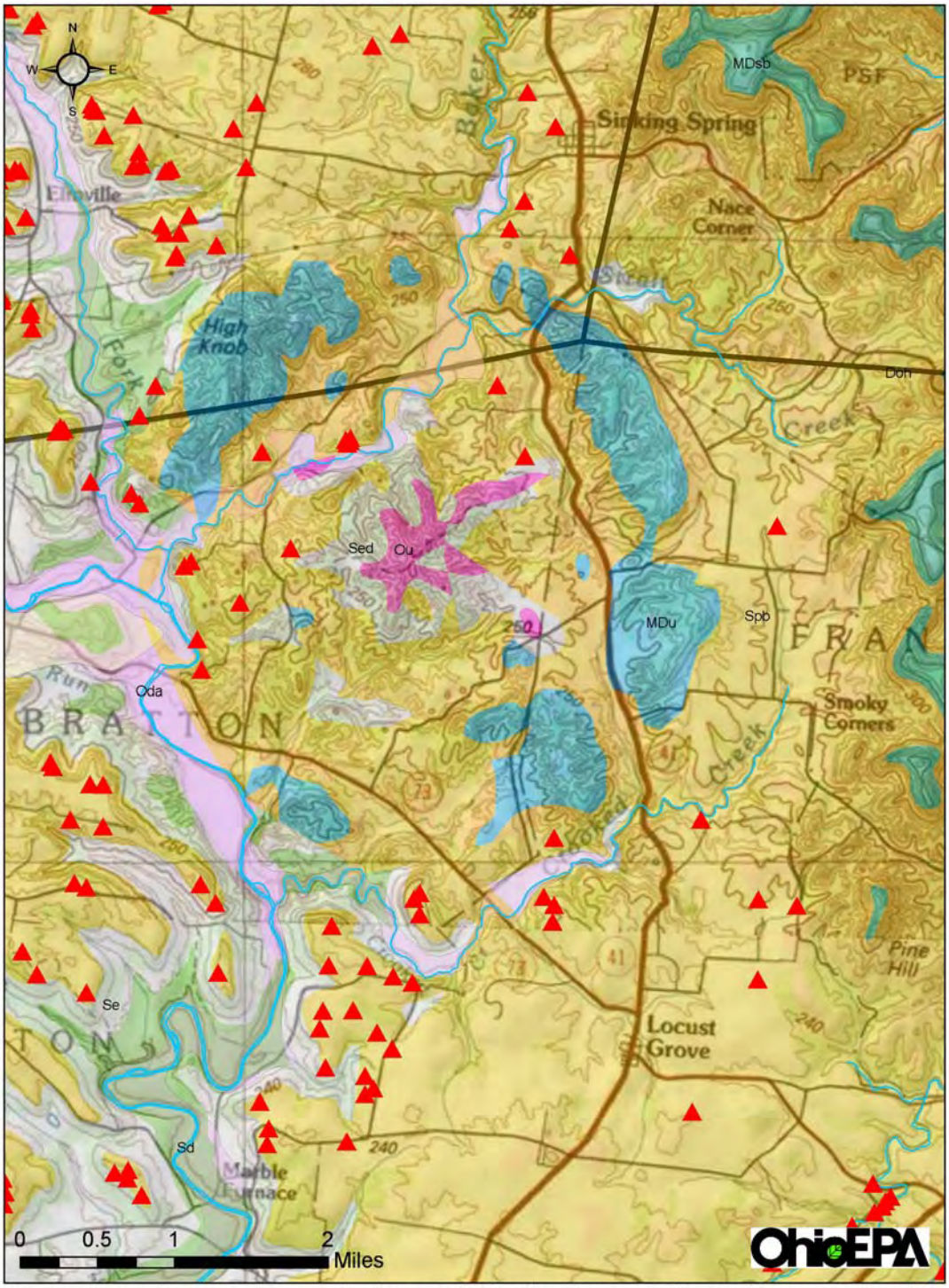


Figure 13. Bedrock geology and karst features within the Ohio Brush Creek watershed, Ohio.



Bedrock geology and karst features within the Serpent Mound impact structure, Ohio Brush Creek Watershed.

Figure 14. Bedrock geology and karst features within the Serpent Mound Disturbance, Ohio Brush Creek watershed, Ohio.

Table 15. Mussel taxa reported from the Ohio Brush Creek watershed (Watters 1988). Nomenclature follows Watters (1993) and Cummings and Mayer (1992). Author acknowledges that some of the common and scientific nomenclature provided below may not be current. In Ohio: **E**-endangered, **T**-threatened, **S**-Species of Concern, **X**-extirpated (Ohio DNR 2009).

Actinonaias l. ligamentina (Mucket)**X**	*Magnonaias nervosa* (Washboard)**E**
Alasmidonta viridis (Slippershell Mussel)	*Obliquaria reflexa* (Threehorn Wartyback)**T**
Amblema plicata plicata (Threeridge)	*Obovaria subrotunda* (Round Hickorynut)
Anodontoides ferussacianus (Cylindrical Papershell)	*Pleurobema clava* (Clubshell)**E**
Cyclonaias tuberculata (Purple Wartyback)**S**	*Potamilus latus* (Pink Heelsplitter)
Pyganodon grandis grandis (Giant Floater)	*Potamilus ohioensis* (Pink Papershell)
Fusconaia flava (Wabash Pigtoe)	*Ptychobranchus fasciolaris* (Kidney Shell)**S**
Lasmigona complanata (White Heelsplitter)	*Quadrula cylindrica cylindrica* (Rabbitsfoot)**E**
L. costata (Fluted-Shell)	*Quadrula quadrula* (Mapleleaf)
Lampsilis ovata (Sharp-ridged Pocketbook)**E**	*Strophitus undulates undulatus* (Squawfoot)
L. radiate luteola (Fatmucket)	*Truncilla truncata* (Deertoe)**S**
L.teres (Yellow Sandshell)**E**	*Truncilla donaciformis* (Fawnsfoot)**T**
L. ventricosa (Plain Pocketbook)	*Tritogonia verrucosa* (Pistolgrip)
Leptodea fragilis (Fragile Papershell)	

Table 16. Freshwater mussel collection records from the Ohio Brush Creek mainstem and selected tributary sites where live or fresh-dead specimens were found, 2007.

Stream / RM	Location	Common Name	Scientific Name
Ohio Brush Creek			
54.72	Deadfall Rd	--	--
52.49	Peach Orchard Rd.	Fatmucket	*Lampsilis radiata luteola*
47.16	Dst. Elk Run	Fatmucket	*Lampsilis radiata luteola*
44.90	Adj. TR 113	--	--
39.0	End of Wallace Rd.	Threeridge	*Amblema plicata plicata*
		Fatmucket	*Lampsilis radiata luteola*
		Pink heelsplitter	*Potamilus alatus*
		Plain pocketbook	*Lampsilis cardium*
		Fluted-shell	*Lasmigona costata*
30.43	Dst. Shimer Run	Fatmucket	*Lampsilis radiata luteola*
		Plain pocketbook	*Lampsilis cardium*
		Fluted shell	*Lasmigona costata*
		Fragile papershell	*Leptodea fragilis*
		Pistolgrip	*Tritogonia verrucosa*
24.80	Adj. Lawshe Rd.,	Plain pocketbook	*Lampsilis cardium*
		Fluted-shell	*Lasmigona costata*
		Fragile papershell	*Leptodea fragilis*
		Pink heelsplitter	*Potamilus alatus*
21.35	Fawcett Rd.	Threeridge	*Amblema plicata plicata*
		White heelsplitter	*Lasmigona complanata*
		Pink heelsplitter	*Potamilus alatus*

Table 16. Freshwater mussel collection records from the Ohio Brush Creek mainstem and selected tributary sites where live or fresh-dead specimens were found, 2007.

Stream / RM	Location	Common Name	Scientific Name
15.2	End of TR 84	Fatmucket	*Lampsilis radiata luteola*
		Pink heelsplitter	*Potamilus alatus*
		Plain pocketbook	*Lampsilis cardium*
		Fluted-shell	*Lasmigona costata*
10.4	SR 125	Fatmucket	*Lampsilis radiata luteola*
		Mapleleaf	*Quadurla quadurla*
		Plain pocketbook	*Lampsilis cardium*
		Fragile papershell	*Leptodea fragilis*
6.1	Dst. Beasly Fork	Threeridge	*Amblema plicata plicata*
		Pink heelsplitter	*Potamilus alatus*
		Plain pocketbook	*Lampsilis cardium*
		Fluted-shell	*Lasmigona costata*
		Fragile papershell	*Leptodea fragilis*
0.5	SR 7 (impounded)	--	--
Baker Fork			
1.5	Horner Chapel Rd.	Fatmucket	*Lampsilis radiata luteola*
		Plain pocketbook	*Lampsilis cardium*
West Fork Ohio Brush Creek			
17.92	Melblanc Rd	Fatmucket	*Lampsilis radiata luteola*
10.5	Ust. Little West Fork	Fatmucket	*Lampsilis radiata luteola*
1.1	Dst. Georges Creek	Mapleleaf	*Quadurla quadrula*
		Pink heelsplitter	*Potamilus alatus*
		Plain pocketbook	*Lampsilis cardium*
		Fatmucket	*Lampsilis radiata luteola*
Crooked Creek			
2.15	SR 73	Giant floater	*Pyganodon grandis*
Little West Fork			
5.69	Shaw Baker Rd	Fat mucket	*Lampsilis radiata luteola*

Biological Assessment of the Fish Community

Ohio Brush Creek

A total of 17,832 fish comprising 58 species and five hybrids was collected from Ohio Brush Creek between July and August, 2007. The fish sampling effort included 23 sampling events, at 12 stations, evaluating 53 miles of the mainstem between RM 54.7 (Deadfall Rd.) and RM 0.5 (US 52).

Based on aggregated catch statistics, numerically predominant species (no./km) included central stoneroller (16.9%), bluntnose minnow (15.0%), striped shiner (10.0%), longear sunfish (5.6%), greenside darter/sand shiner (5.0%), rainbow darter (4.7%), and golden redhorse (4.0%). In terms of relative biomass (kg/km), dominant species were golden redhorse (18.5%), black redhorse (10.4%), freshwater drum (9.7%), smallmouth bass (7.0%), channel catfish (6.3%), gizzard shad (5.7%), and northern hog sucker (5.6%). Remarkably, over 40% of all fish and fully 50% of total biomass collected from the mainstem were pollution sensitive taxa.

Fish species classified as rare, threatened, endangered, or otherwise recognized for special conservation status by the Ohio DNR (2003), included the mooneye, river redhorse, and slenderhead darter. These species were limited to the lower reaches of the mainstem, and in Ohio are common associates of medium to large river within the Ohio River drainage (Trautman 1981). Other highly intolerant, rare, declining or otherwise ecologically significant species included mooneye, slenderhead darter, black redhorse, silver chub, southern redbelly dace, silver shiner, mimic shiner, brindled madtom, stonecat, and banded darter (Ohio EPA 1987 and 1996). Although not presently imperiled, species so defined have experienced a significant reduction in their historical distributions statewide or have been found to be extremely sensitive to a wide range of environmental disturbance, and, therefore, their presence is considered indicative of the best riverine habitats in Ohio.

Community indices and accompanying narrative evaluations for Ohio Brush Creek ranged between exceptional (IBI=58/MIwb=10.5) and marginally good (IBI=37/MIwb=8.2). It must be noted, however, the lower limits of community performance were described by samples from the Ohio River backwaters and thus represent outlying values. Median community performance, as measured by the IBI and MIwb, remained within the *exceptional* range (IBI=52.5 and MIwb=9.75). Longitudinal performance of the IBI, MIwb, and other relevant indicators are presented in Figure 15. Summarized index scores and community statistics by station are presented in Table 17. Index metrics, scores and fish species and abundance data by sampling location are located in Appendix Tables 6 and 7.

As measured by the IBI and MIwb (the latter, where applicable), community performance through the entire length of Ohio Brush Creek was found fully consistent with the existing EWH and WWH biocriteria. Every station was found to support an assemblage of fish possessing the expected structure, functional organization, and species richness comparable to reference conditions within the ecoregion. Environmentally sensitive taxa were well represented and comprised a significant proportion of the catch from each fish sampling station. The incidence of serious disease or other external anomalies was typically at or below expected levels, and mean values were never greater than 0.2% of individuals collected at any sampling site. As measured or otherwise indicated by the performance of the fish community, all point and non-point source pollutant loads currently delivered to Ohio Brush Creek appeared safely assimilated.

The need to discuss community performance at a reach or station scale is limited to the river segments between RMs 47.2 and 44.9, and the lower site at RM 0.5. Despite diminished QHEI scores, related primarily to desiccation and its attendant effects, the segment between RMs 47.2 and 44.9 was found to support a fish community consistent with EWH biocriteria. As articulated in the Physical Habitat Section of this report, residual pools present through this otherwise dry stream segment proved more than adequate as a dry weather refuge. This was largely due to the contribution of either hyporheic flow or a direct connection to the water table, or both. The ability of native fish assemblages to endure an ephemeral flow regime, provided certain conditions are met, has been well-documented statewide. Similarly, the segment impounded by the Ohio River backwater, evaluated at RM 0.5, supported a marginally good assemblage just meeting the prescribed biocriteria, despite the simplified habitats associated with flooded river mouths.

Table 17. Fish community indices, descriptive statistics, and biological narratives for the Ohio Brush Creek basin, 2007.

Stream River Mile	Mean No. Species	Total Species	Mean Rel. No. (No./km)	Mean Rel. Wt. (wt./km)	QHEI	IBI	MIwb	Narrative
Ohio Brush Creek (10-200)								
Interior Plateau (IP) - EWH Aquatic Life Use (Existing)								
54.7 [H]	22.0	22	1563.0	4.68	67.0	56	NA	Exceptional
52.5 [W]	26.5	30	1096.5	23.7	73.0	53	9.6	Exceptional
47.2 [W]	23.0	25	1227.8	14.8	57.0	51	9.2[ns]	Except./Very Good
44.9 [W]	26.5	27	1150.5	14.3	66.5	55	9.8	Exceptional
40.4 [W]	30.0	32	1158.4	35.1	74.5	51	9.8	Exceptional
30.4 [W]	34.5	38	1693.5	34.8	79.5	58	10.4	Exceptional
24.8 [W]	33.5	38	1209.0	11.7	81.0	52	9.5	Exceptional
21.4 [W]	32.0	38	1478.3	31.3	84.5	57	10.4	Exceptional
15.2 [W]	30.0	34	1442.3	30.5	79.5	51	10.4	Exceptional
10.4 [W]	34.5	42	1164.8	29.6	83.0	54	10.0	Exceptional
Interior Plateau (IP) - WWH Aquatic Life Use (Existing)								
6.0 [B]	31.0	36	707.0	56.4	77.5	49	9.8	Very Good/Except.
0.5 [B]	18.5	24	457.0	24.3	58.0	37[ns]	8.2[ns]	Marginally Good
Lost Fork (10-237)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
2.5[H]	19.0	19	1288.0	4.59	49.5	52	NA	Exceptional
1.7[H]	24.0	24	840.0	32.9	59.0	54	NA	Exceptional
Elk Run (10-234)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
1.4 [H]	24.0	24	2139.4	12.5	60.5	52	NA	Exceptional
0.8 [H]	19.0	19	1111.7	7.99	51.0	50	NA	Exceptional
Elm Run (10-233)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
1.75 [H]	20.0	20	2310.0	11.5	50.5	50	NA	Exceptional
Baker Fork (10-240)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
14.7[H]	18.0	18	1434.0	6.65	50.5	50	NA	Exceptional
Interior Plateau (IP) - EWH Aquatic Life Use (Existing/Recommended)								
10.5 [W]	25.5	27	1125.0	14.6	71.0	54	9.6	Exceptional
1.5 [W]	31.0	33	1797.8	16.7	73.5	57	10.6	Exceptional
Middle Fork Baker Fork (10-241)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
5.4 [H]	23.0	23	1383.0	32.3	69.5	58	NA	Exceptional
0.3 [W]	26.0	28	1089.0	8.73	64.0	57	9.5	Exceptional
Strait Creek (10-245)								
Interior Plateau (IP) - WWH/EWH Aquatic Life Use (Existing/Recommended)								
0.8 [H]	24.0	24	957.0	6.97	69.0	58	NA	Exceptional

Table 17. continued.

Stream River Mile	Mean No. Species	Total Species	Mean Rel. No. (No./km)	Mean Rel. Wt. (wt./km)	QHEI	IBI	MIwb	Narrative
Muddy Fork (10-246)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
0.4 [H]	17.0	17	1942.0	7.79	58.0	50	NA	Exceptional
Crooked Creek (10-218)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
2.2[H]	21.0	21	1641.0	19.4	67.5	52	NA	Exceptional
Little East Fork (10-216)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
0.9[H]	22.0	22	894.0	3.22	68.0	50	NA	Exceptional
0.4[H]	17.0	17	453.3	1.81	57.5	52	NA	Exceptional
Shimer Run (10-248)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
0.1[H]	17.0	17	492.0	3.37	76.5	54	NA	Exceptional
West Fork Ohio Brush Creek (10-220)								
Interior Plateau (IP) - EWH/WWH Aquatic Life Use (Existing/Recommended)								
20.5[H]	14.0	14	654.0	1.99	48.5	46	NA	Very Good
17.9[H]	21.0	21	879.0	8.48	79.0	42	NA	Good
15.2[W]	22.5	23	2355.0	17.9	61.0	49	9.7	V. Good/Exceptional
Interior Plateau (IP) - EWH Aquatic Life Use (Verified)								
12.7[W]	23.5	26	1255.8	8.54	64.5	55	9.6	Exceptional
10.5[W]	29.0	33	2246.3	34.7	65.5	52	10	Exceptional
6.1[W]	22.0	33	864.0	20.3	67.0	52	9.5	Exceptional
1.1[W]	30.5	35	1289.3	18.8	70.5	55	9.9	Exceptional
Elk Fork (10-230)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
1.6[H]	14.0	14	782.0	7.59	68.5	46	NA	Very Good
Little West Fork (10-229)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
6.3[H]	10.0	10	1093.9	3.85	56.5	30*	NA	Fair
5.7[H]	17.0	17	1058.0	7.24	57.5	48	NA	Very good
0.1[W]	29.0	25.5	1650.0	4.73	53.5	48	8.9	Very Good
Buck Run (10-225)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
0.4[H]	23.0	23	1172.0	10.9	63.0	46	NA	Very Good
Cherry Fork (10-224)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
8.7[H]	15.0	15	1270.0	4.87	51.5	46	NA	Very Good
7.5[H]	19.0	19	1402.5	11.4	52.5	50	NA	Exceptional
2.6[W]	21.0	23	2239.5	10.1	51.5	40	9.0	Good/Very Good
Grace Run (10-225)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
1.3[H]	15.0	15	1984.0	15.2	31.5	42	NA	Good

Table 17. continued.

Stream River Mile	Mean No. Species	Total Species	Mean Rel. No. (No./km)	Mean Rel. Wt. (wt./km)	QHEI	IBI	MIwb	Narrative
Georges Creek (10-222)								
Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)								
3.2[H]	13.0	13	440.0	4.46	58.0	38[ns]	NA	Marginally Good
0.1[H]	27.0	27	14453.3	12.1	71.5	54	NA	Exceptional
Lick Fork (10-211)								
Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)								
4.3[H]	12.0	12	1496.3	10.6	63.0	42	NA	Good
0.7[H]	27.0	27	372.0	13.5	72.0	58	8.7	Exceptional/Good
Trebor Run (10-212)								
EWH/WWH Aquatic Life Use (Existing/Recommended)								
0.1[H]	23.0	23	1152.0	7.80	59.5	50	NA	Exceptional
Cave Run (10-213)								
Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)								
0.1[H]	10.0	10	242.0	1.18	59.0	42	NA	Good
UN Lick Fork Trib. at RM 4.02 (10-215) [AKA Louiso Tributary]								
EWH/WWH Aquatic Life Use (Existing/Recommended)								
0.2[H]	15.0	15	1552.0	6.79	56.5	46	NA	Very Good
Cedar Run (10-209)								
Interior Plateau (IP) - EWH Aquatic Life Use (Verified)								
0.4[H]	26.0	26	957.0	11.6	74.0	56	NA	Exceptional
Beasley Fork (10-205)								
Interior Plateau (IP) - WWH Aquatic Life Use (Verified)								
4.7[H]	14.0	14	2720.0	11.8	66.0	52	NA	Exceptional
3.2[H]	18.0	18	4518.0	16.9	60.0	54	NA	Exceptional
0.8[H]	22.0	22	1261.5	8.38	81.5	52	NA	Exceptional
UN Beasley Fork Trib. at RM 4.6 (10-205)								
Interior Plateau (IP) – WWH Aquatic Life Use (Unlisted/Recommended)								
0.2[H]	13.0	13	2614.0	7.18	61.0	46	NA	Very Good
Moores Run (10-206)								
Interior Plateau (IP) – EWH/WWH Aquatic Life Use (Existing/Recommended)								
0.2[H]	12.0	12	2200.0	4.37	52.5	50	NA	Exceptional

a - Relative abundance and relative weight estimates normalized to 0.3 km for wading sites and 1.0 km for boat sites.
H - Headwaters: sites draining areas $\leq$ 20 miles^2.
W - Wadable streams: sites draining areas > 20 miles^2.
B - Boat sites (large waters).
ns - Non-significant departure from the biocriteria ($\leq$4 IBI units or $\leq$0.5 MIwb units).
* - Significant departure from the biocriteria (>4 IBI units or >0.5 MIwb units).

Table 17. continued.

Ecoregional Criteria (OAC 3745-1-07, Table 7-15)

Interior Plateau Ecoregion (IP)

Index-Site Type	WWH	EWH	MWH[d]
IBI- Headwater/Wading	40	50	24
MIwb-Wading	8.1	9.4	6.2
IBI-Boat	38	48	24
MIwb-Boat	8.5	9.6	5.8

d – Modified Warmwater Habitat (MWH) for channel modified or impounded areas.

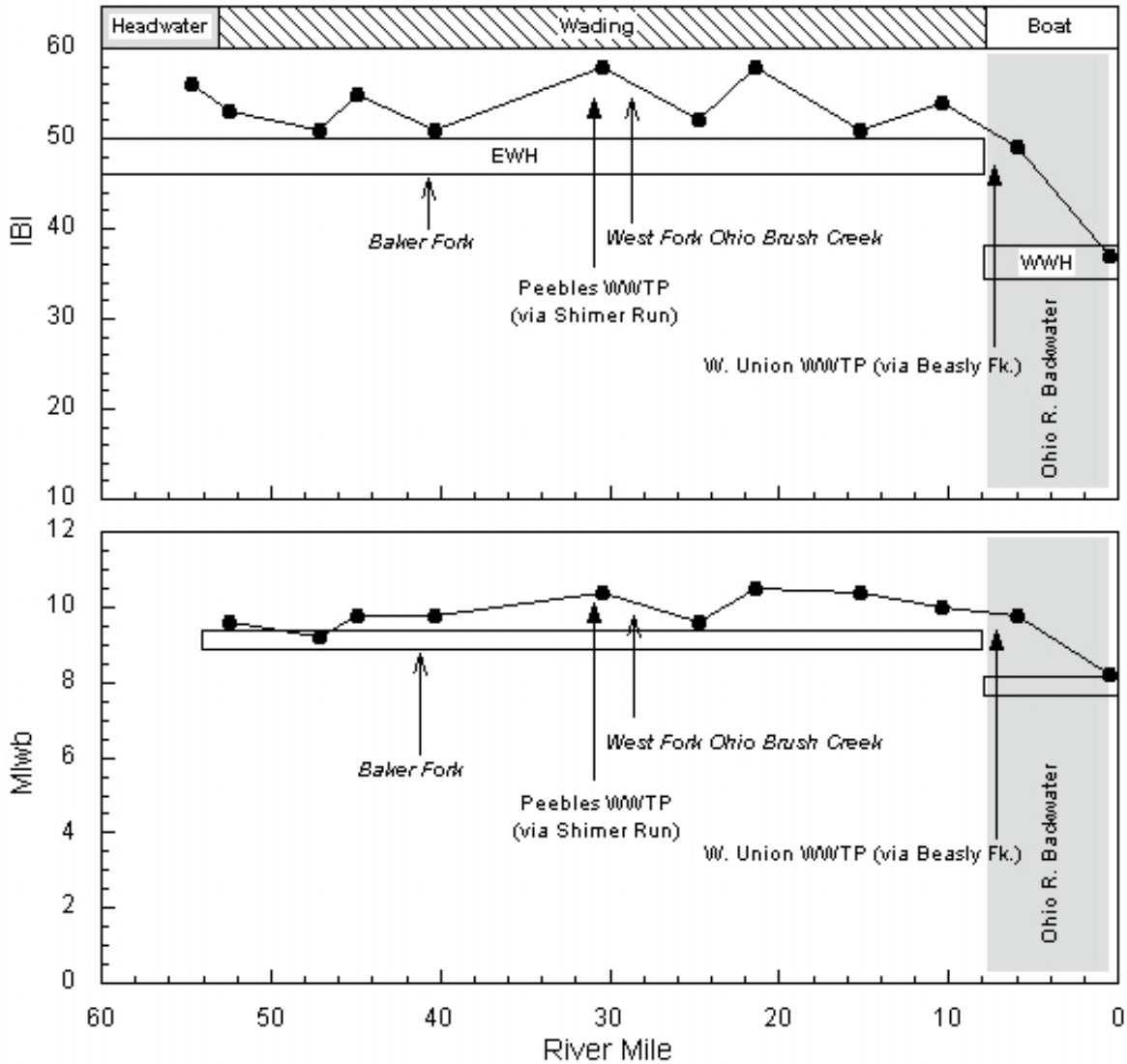


Figure 15. Longitudinal performance of the Index of Biological Integrity (IBI) and Modified Index of well-being (MIwb), Ohio Brush Creek, 2007. Vertical shaded area represents the lower reach impounded by the Ohio River. Horizontal rectangles represent biocriteria and areas of non-significant departure in support of the existing EWH and WWH aquatic life use designations. Arrows identify direct and indirect points of discharge for NPDES permitted entities.

Ohio Brush Creek Tributaries

The fish assemblages of 25 direct and indirect tributaries that comprise the principal drainage network of Ohio Brush Creek were surveyed and assessed in 2007. Forty-five sampling stations were deployed to this effort, evaluating 97 cumulative stream miles. Survey results between July and August, 2007, yielded a total of 48,128 fish comprising 54 species and four hybrids.

Based on aggregated catch statistics, numerically predominant species (no./km) included, central stoneroller (22.3%), bluntnose minnow (16.3%), striped shiner (10.5%), longear sunfish (6.13%), rainbow darter (5.5%), and fantail darter (5.1%). In terms of relative biomass (kg/km), dominant species were golden redhorse (10.0%), central stoneroller (9.4%), longear sunfish (9.3%), black redhorse (8.8%), white sucker (8.4%), smallmouth bass (8.1%), and striped shiner (6.8%). Forty percent of all fish and fully 50% of total biomass collected from the tributary sites were pollution sensitive taxa.

No fish species classified as rare, threatened, endangered, or otherwise recognized for special conservation status by the Ohio DNR (2009) were collected from Ohio Brush Creek tributaries surveyed as part of the 2007 field effort. However, highly intolerant, declining or otherwise ecologically significant species included black redhorse, silver shiner, southern redbelly dace, mimic shiner, brindled madtom, stonecat, and banded darter (Ohio EPA 1987 and 1996). Although not presently imperiled, species so defined have experienced a significant reduction in their historical distributions statewide or have been found to be sensitive to a wide range of environmental disturbance, and, therefore, their presence is considered indicative of high quality riverine habitats in Ohio.

Community indices and accompanying narrative evaluations for Ohio Brush Creek tributaries ranged between exceptional (IBI=58/MIwb=10.6) and marginally good/very good (IBI=30/MIwb=8.9). Median community performance, as measured by the IBI and MIwb, remained within the exceptional range (IBI=50.0 and MIwb=9.6). Longitudinal performance of the IBI, MIwb, and other relevant indicators for the West Fork Ohio Brush Creek, the largest tributary, is presented in Figure 16. Summarized index scores and community statistics for all tributary sites are presented in Table 17. IBI metrics and scores and fish species and abundance data by tributary sampling location are located in Appendix Tables 6 and 7.

Biological performance narratives for 87% of tributary sampling stations (38 sites), evaluating all or a portion of 23 streams, ranged between very good and exceptional. Eleven percent of tributary stations supported good to marginally good communities. A narratively fair fish assemblage was indicated at only one sampling station (2% of the entire tributary sampling effort). More importantly, fully 98% of Ohio Brush Creek tributary sampling sites were found to support a fish assemblage fully consistent with existing and recommended aquatic life uses (WWH or EWH).

Only the uppermost reach of the Little West Fork, sampled at RM 6.3 (Forsythe Rd.), failed to support a fish assemblage consistent with the recommended WWH aquatic life use. In comparison to adjacent sites, the fish assemblage for the upper reach of the Little West Fork showed a marked decline in environmentally sensitive fish taxa, including specialist

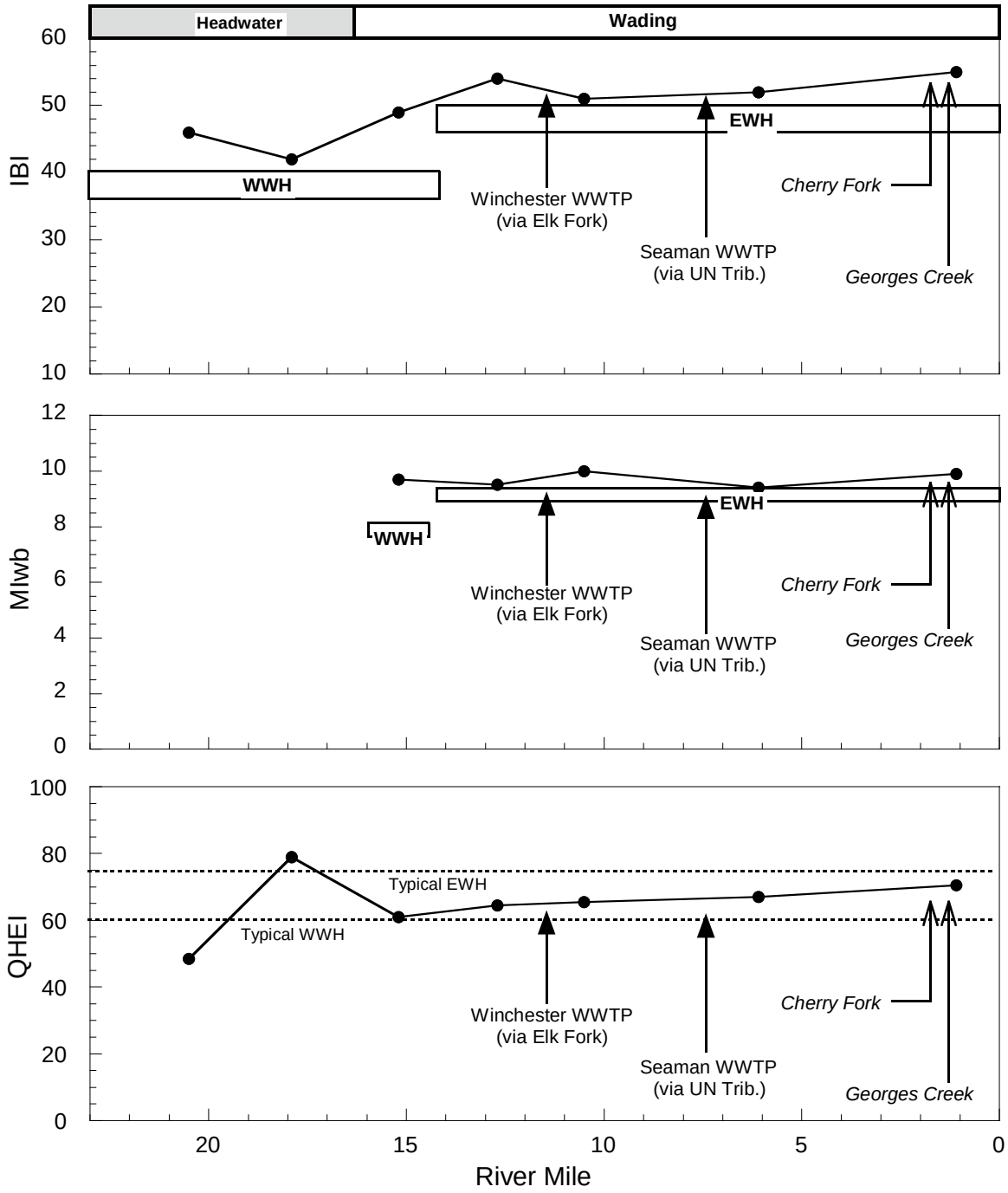


Figure 16. Longitudinal performance of the IBI, MIwb, and QHEI for the West Fork Ohio Brush Creek, 2007. Horizontal rectangles represent biocriteria and ranges of non-significant departure in support of the existing and recommended WWH and EWH aquatic life use designations. Dashed lines indicate typical QHEI values associated with WWH and EWH performance. Arrows identify direct and indirect points of discharge for NPDES permitted entities.

insectivores, and a significant increase in the proportion of environmentally tolerant and omnivorous species. All sampling sites on the Little West Fork bore evidence of livestock, as much of the area that comprises this subbasin appeared in pasture. Departure from the recommended WWH biocriterion on the uppet reach appeared related to unrestricted cattle access and its attendant effects. However, the condition of the fish assemblage here was not indicative of profound degradation, and it is likely that the impact documented in 2007 was temporal in nature. The deleterious effects of the pollutant loads and impacts to macrohabitat quality associated with unrestricted cattle access were very likely brought to the fore by drought, the effects of which were more forcefully realized in the uppermost reaches that drain only a fraction of the basin. Through time, community performance likely varies with flow regime, and the net performance of the assemblage likely hovers near the minimum criterion, varying with the season's hydrology.

All remaining tributary stations were found to support fish assemblages fully consistent with the biocriteria applicable to existing and recommended aquatic life uses. Community performance below the minimum WWH, Interior Plateau biocriteria (and statewide EWH where applicable) was not observed. As measured or otherwise indicated by the performance of the fish community, point and non-point source pollutant loads currently delivered to these tributaries appeared safely assimilated.

Ambient Biological Trends Assessment

Benthic Macroinvertebrates: 1984-2007

Historical sampling in the Ohio Brush Creek basin tends to support the 2007 findings of exceptional quality through most of the mainstem and negative influences associated with summer low flow conditions in small drainages, particularly in the western half of the basin.

Since 1984, sampling on the Ohio Brush Creek mainstem has been conducted at 32 locations during longitudinal surveys and from the RM 15.2 historical reference site near West Union (Figure 17). Due to sampler loss or inadequate current velocities at some sites, ICI scores based on the qualitative sample narrative evaluation were substituted for trend analysis.

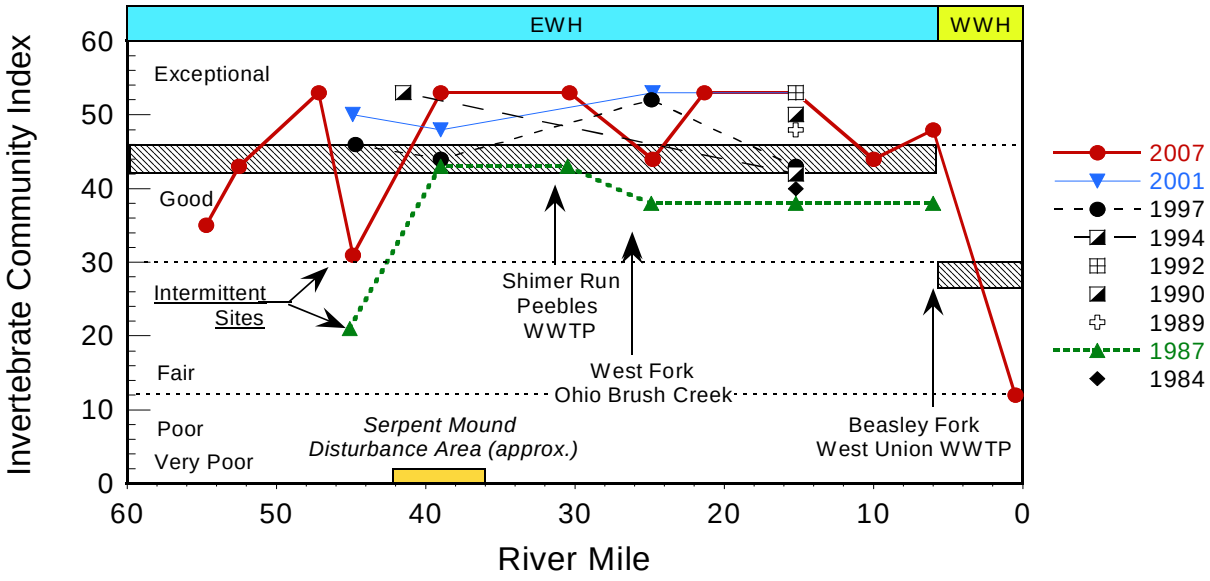


Figure 17. Invertebrate Community Index (ICI) trends in Ohio Brush Creek, 1984-2007. Where valid artificial substrate results were lacking, an ICI score based on the qualitative narrative evaluations was substituted.

Since 1989, nearly all mainstem sampling sites have reflected very good to exceptional quality and met the current EWH use designation. Performance below EWH standards was limited to only two 2007 sites in the upper mainstem under intermittent or very low-flow conditions. A 1987 mainstem survey was also conducted during an extreme drought with similar results; fair quality under intermittent flow conditions was detected near the same non-attaining location in 2007 (RM 44.9). Macroinvertebrate performance in 1987 also appeared to drop slightly below EWH standards through the 18 mile stretch from West Fork Ohio Brush Creek to Beasley Fork (RMs 23.6-6.1). Massive filamentous algal growth, particularly at the RM 15.2 reference site, suggested nutrient enrichment during the period.

Still, the age of the survey data (20 years) coupled with reliance on the qualitative, narrative evaluations makes broad statements about historic changes in quality difficult to ascertain.

Year to year performance in smaller Ohio Brush Creek drainages was more variable and more strongly related to low flow and drought conditions than at the mainstem sites. Sampling during the higher flow summers in 1997 and 2001 found the majority of sites performed above WWH (1997) or EWH criteria (2001) (Figure 18). In contrast, a majority of sites fell below WWH criteria during the extremely low flow conditions encountered in 2007 and 1987.

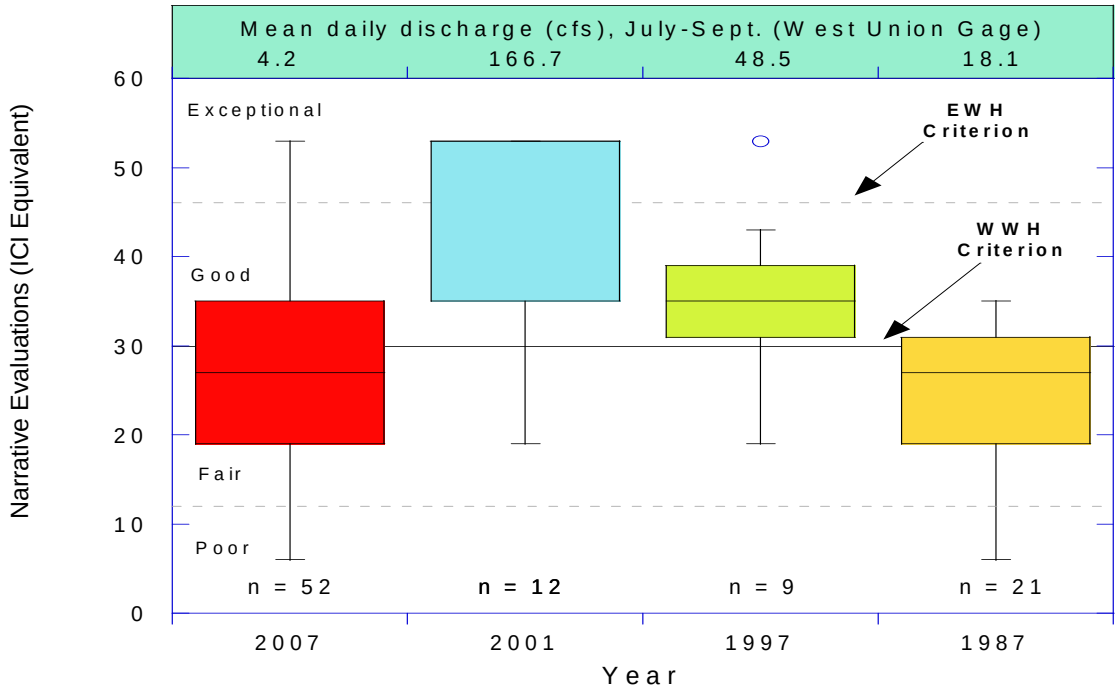


Figure 18. Box and whisker plots of macroinvertebrate performance based on narrative evaluations and expressed as equivalent ICI scores at Ohio Brush Creek basin sampling sites less than 150 square miles in drainage area, 1987, 1997, 2001, and 2007.

This trend of flow related variability in performance was often observed in the same streams at the same locations. For example, similar sites in Cherry Fork, Little East Fork and Little West Fork ranged from fair during very low flow years to good or exceptional during higher flow surveys. Qualitative EPT and sensitive taxa richness followed a mostly similar trend with greater numbers found during the high flow years (Figure 19), particularly from small drainages in the western half of the basin.

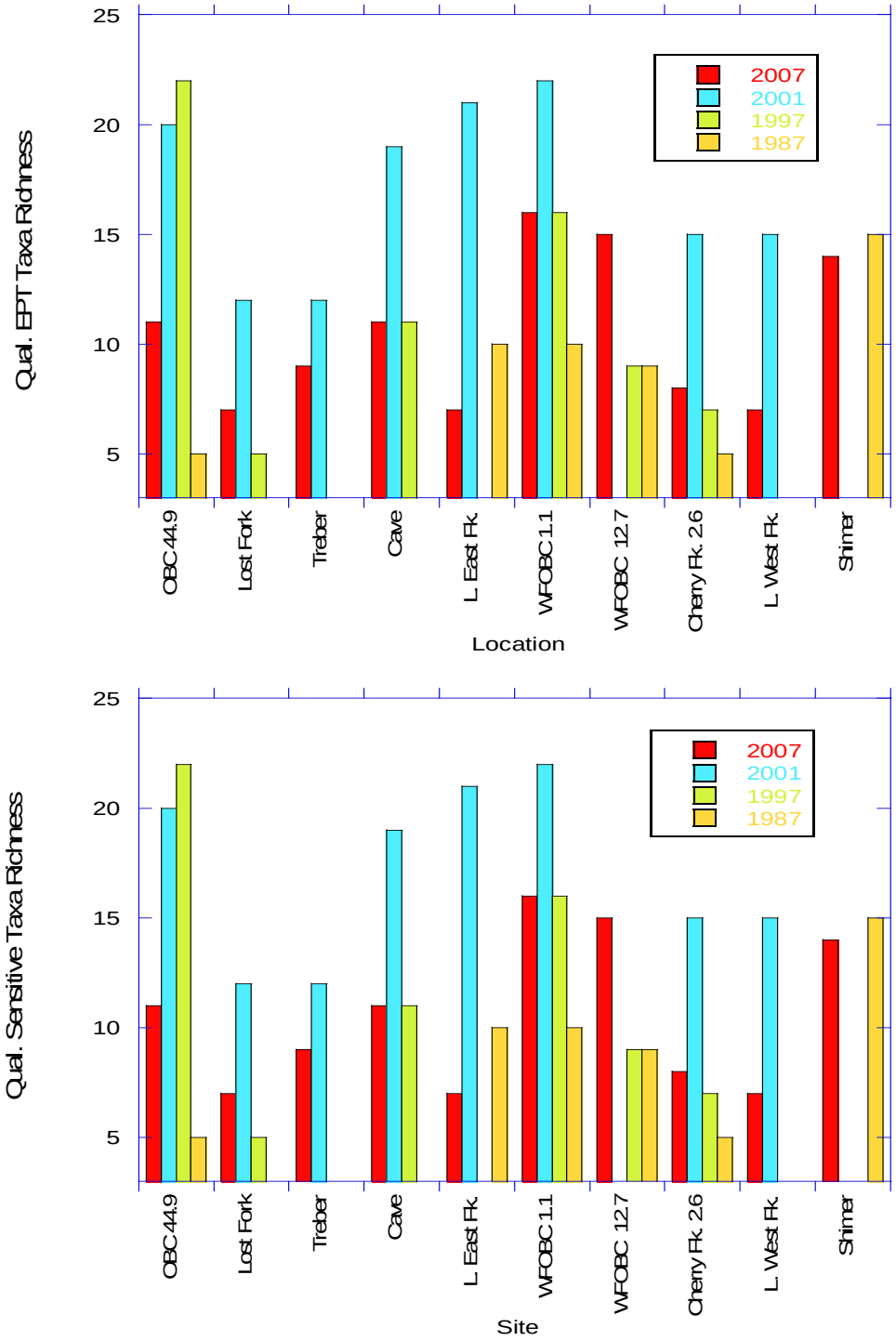


Figure 19. EPT and sensitive taxa richness from selected Ohio Brush Creek basin sites less than 150 square miles drainage area sampled during multiple years, 1987-2007.

Fish Communities: 1987-2007

The fish fauna of Ohio Brush Creek basin has been regularly surveyed and assessed by Ohio EPA since 1984. Prior field work has included all or portions of the mainstem and selected tributaries, supporting various water quality management goals (e.g. NPDES, stream regionalization, use attainability analysis, and reference site monitoring). The most thorough of these historical sampling efforts was done in 1987, where the majority of the basin (mainstem and tributaries) was systematically sampled (Ohio EPA 1989a). The 2007 survey results represent the most comprehensive effort to date, extending sampling coverage of the mainstem and tributaries beyond all previous efforts. For the purposes of trends assessment, the historical results, where compatible, will be compared against contemporary conditions.

In order to succinctly summarize and compare survey results between field years, analysis of trends will take two forms: 1) aggregated annual trends, examining cumulative performance from comparable field years through time and 2) comparative longitudinal trends, relative to the principal associated stressors, through time. Where stream specific data are limited to a few sampling stations, trend assessment will take the form of a narrative, as these data do not lend themselves to statistical treatment, aggregation, or longitudinal display. A great deal of overlap between field years provides an excellent opportunity to evaluate meaningful changes, or lack thereof, in the environmental conditions of the Ohio Brush Creek watershed through the period of record. This approach will be applied to both the mainstem of Ohio Brush Creek and its tributaries.

<u>Aggregate Community Performance: Ohio Brush Creek, 1987-2007</u>

Mainstem survey efforts 1987 were complimentary, nearly duplicating the 2007 coverage of the mainstem. Sporadic sampling efforts from the intervening field years (1995-2001) are not suited to aggregation, given the limited number of sample site for each year. Alternatively, these data are best suited to a longitudinal trend assessment.

Cumulative community performance summarized by box and whisker plots of the IBI for Ohio Brush Creek is presented in Figure 20. Community performance appeared modestly improved, with the 2007 results showing higher median, 75th percentile, and 25th percentile values, with less interquartile variation, in comparison with the basline surveys of the mid-1980s. It is important to note that results from both periods coincided with severe drought (Ohio DNR 1987 and 2007). Considering expected natural variation, conditions within the watershed appeared stable to improving, through time.

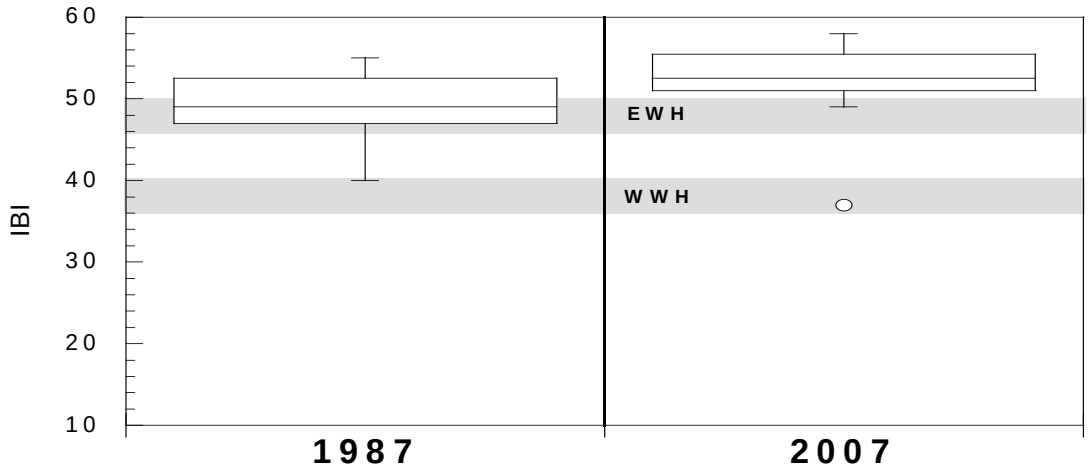


Figure 20. Aggregated Index of Biotic Integrity (IBI) scores from Ohio Brush Creek, 1987 and 2007. Shaded areas represent WWH and EWH biocriteria and ranges of non-significant departure.

Longitudinal Trends: 1987-2007

Multiple data sets were available to assess the environmental conditions of Ohio Brush Creek over the past 20 years. So as to better display longitudinal performance, through time, fish sampling results from the years 1987, 1997, 2001, and 2007 are presented in Figure 21. IBI and MIwb scores derived from historical sampling efforts were remarkably consistent, comporting, almost exclusively, with the prescribed biocriteria. Departures were indicated only in 1997 and 2001 and were highly localized (limited to one station), modest in nature, and manifest in the MIwb alone. However, by 2007 this slight deficiency was recovered to a fully exceptional level. Furthermore, all other common stations were found to contain comparable fish assemblages indicating remarkable ecological stability through the period of record.

Longitudinal trends in the West Fork Ohio Brush Creek were derived from the 1987 and 2007 sampling results. At stations common to both surveys, high quality and stable fish assemblages were indicated (Figure 22). All sites supported communities fully consistent with the existing and recommended aquatic life use designations. As indicated by the condition of the resident fish assemblage, waste loads from POTWs delivered to the West Fork appeared safely assimilated through time.

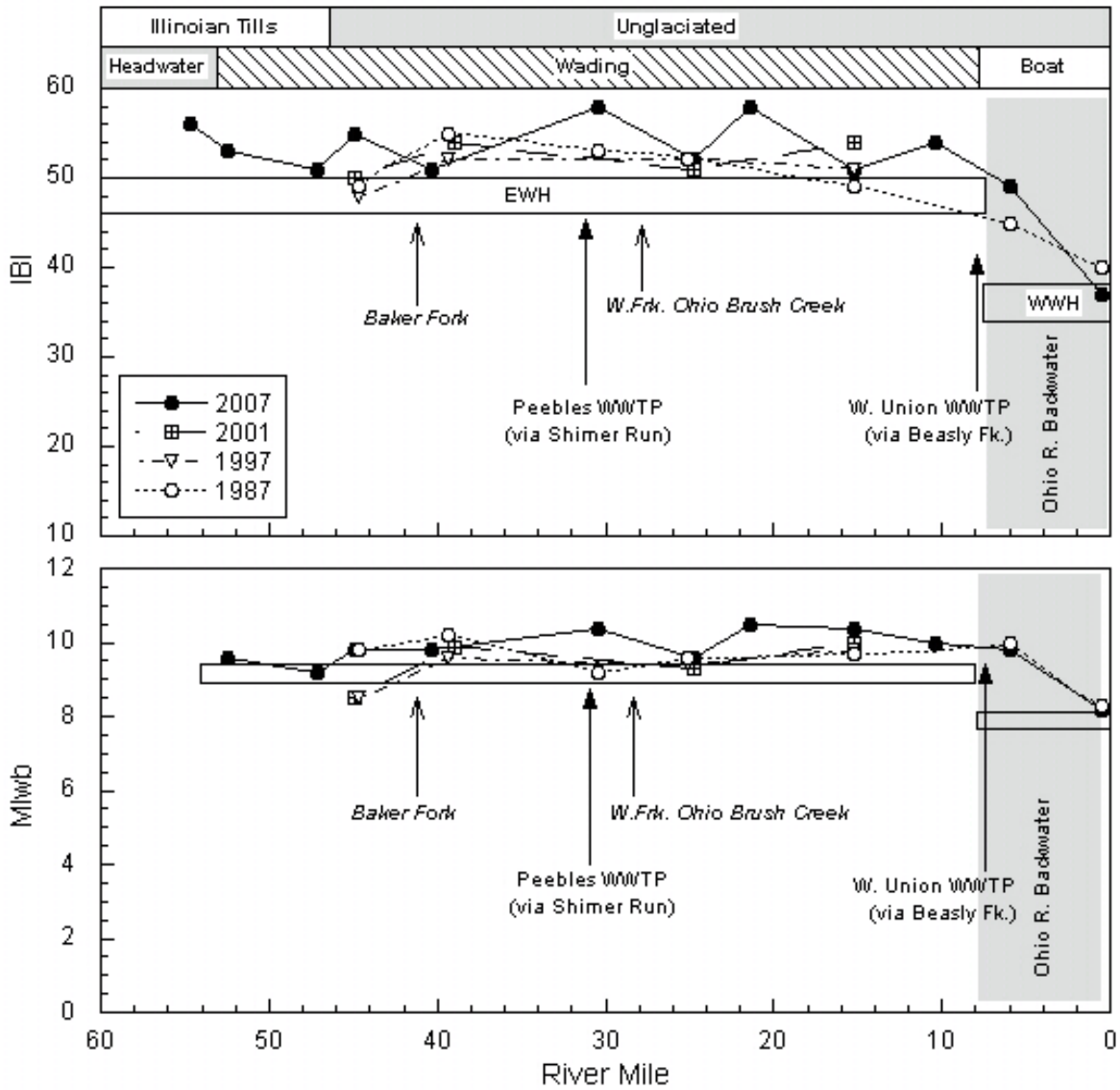


Figure 21. Longitudinal performance of the Index of Biotic Integrity (IBI) and Modified Index of well-being (MIwb) for Ohio Brush Creek, 1987-2007. Vertical shaded area represents the lower reach impounded by the Ohio River. Horizontal rectangles represent biocriteria and ranges of non-significant departure in support of the existing EWH and WWH aquatic life use designations. Arrows identify direct and indirect points of discharge for NPDES permitted entities.

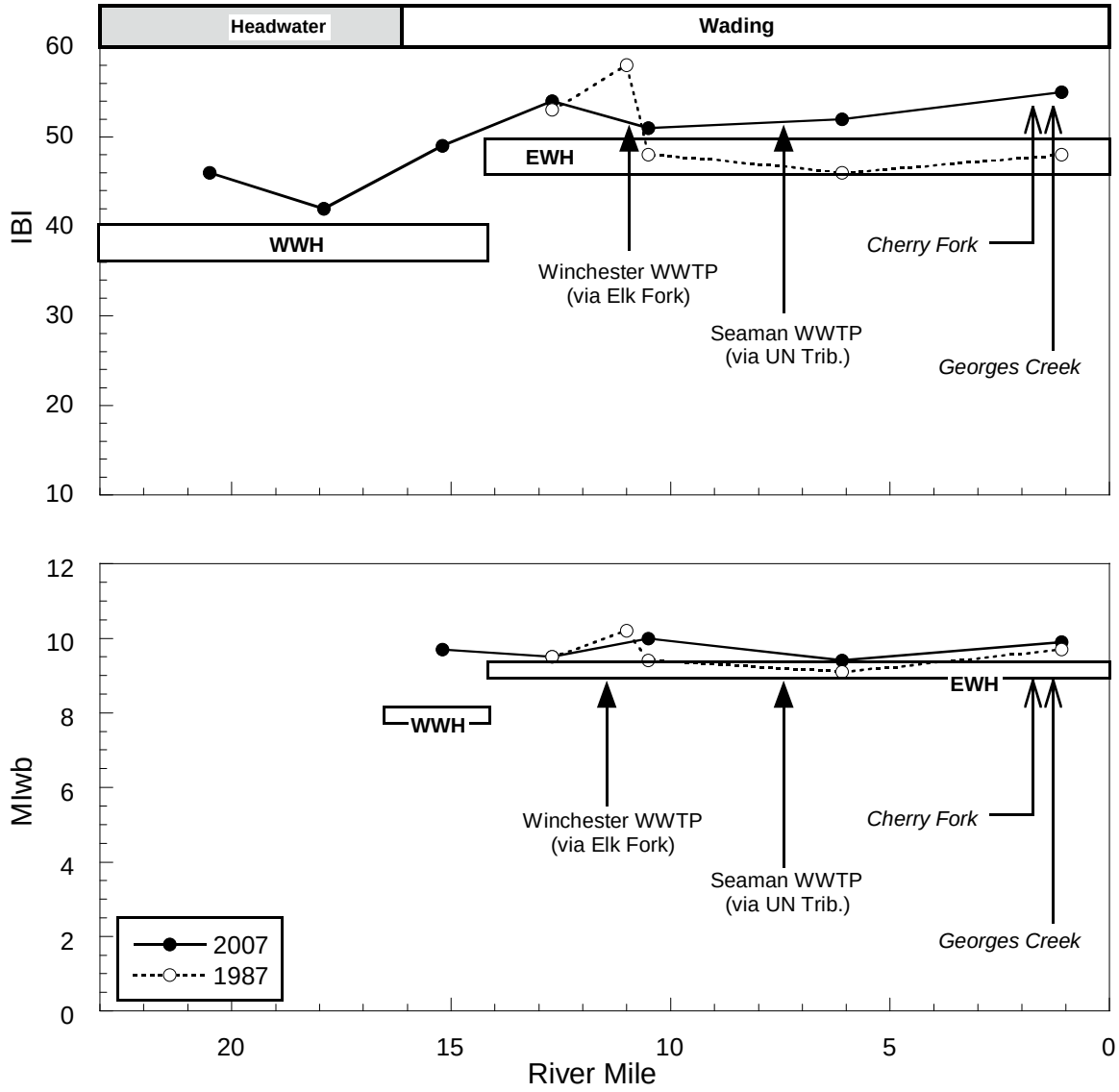


Figure 22. Longitudinal performance of the Index of Biotic Integrity (IBI) and Modified Index of well-being (MIwb) for the West Fork Ohio Brush Creek, 1987 and 2007. Horizontal rectangles represent biocriteria and ranges of non-significant departure in support of the existing and recommended WWH and EWH aquatic life use designations. Dashed lines indicate typical QHEI values associated with WWH and EWH performance. Arrows identify direct and indirect points of discharge for NPDES permitted entities.

Narrative Trends for Selected Tributaries: 1986-2007

A variety of fish community data has been gathered by Ohio EPA from other selected Ohio Brush Creek tributaries since 1986 including Baker Fork, Middle Fork Baker Fork, Little East Fork, Cherry Fork, Shimer Run, and Beasley Fork. Stable and high quality fish communities were collected from Middle Fork Baker Fork, Cherry Fork, Shimer Run, and Little East Fork. These streams have continued to support fish assemblages consistent with their associated biocriteria. Previous surveys between 1986 and 1987 found modest impairments in both the upper reaches of Beasley Fork and Baker Fork. In 1987, upper Beasley Fork was impacted by the West Union WWTP. In addition to depressed biology, water quality downstream from this minor WWTP was poor (e.g., low DO values, sludge deposits, high concentrations of fecal coliform bacteria, and elevated nutrients) [Ohio EPA 1989a]. Based upon the 2007 survey results, the fish assemblages were fully recovered; this attributed to pollution abatement efforts by West Union. Similarly, the impact identified in the headwaters of Baker Fork was abated in 2007. The improvement, however, was attributed to natural restoration or physical recovery of an otherwise habitat modified stream.

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Biological and Water Quality Study of Ohio Brush Creek and Principal Tributaries, 2007

Appendix

Adams, Highland, Brown, and Pike Counties

February 14, 2011
OHIO EPA Technical Report EAS/2010-7-10

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Appendix Table 1. Ohio Brush Creek chemical/physical and bacteriological water sampling results, 2007. NA = not analyzed.

		Site Location: **Ohio Brush Creek @ Deadfall Road** River Mile: 54.7 Storet: 200740					Site Location: **Ohio Brush Creek @ Peach Orchard Rd.** River Mile: 52.49 Storet: 300295				
					Dupl. A	Dupl. B					
		6/25/2007	7/30/2007	8/8/2007	9/12/2007	9/12/2007	6/25/2007	7/30/2007	8/8/2007	9/12/2007	
Parameter	Units	11:55 AM	12:06 PM	11:12 AM	11:51 AM	11:51 AM	12:49 PM	12:45 PM	11:45 AM	12:21 PM	
Aluminum	ug/L	212	<200	<200	<200	<200	<200	245	411	339	
Ammonia	mg/L	<0.050	<0.050	<0.050	0.067	0.061	<0.050	<0.050	0.069	<0.050	
Arsenic	ug/L	2.2	2.3	3	2.1	2	<2.0	<2.0	<2.0	<2.0	
BOD5	mg/L	3.3	NA	NA	<2.0	<2.0	<2.0	NA	NA	2	
Barium	ug/L	71	54	63	53	52	49	50	53	51	
CBOD5	mg/L	2.2	3.8	6.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
COD	mg/L	35	15	15	19	19	27	<10	<10	13	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	47	42	45	45	45	55	47	45	41	
Chloride	mg/L	104	15.4	17.8	21.4	21.6	10.9	10.7	10.9	11.8	
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30	<30	
Conductivity	µmhos/cm	694	426	435	341	342	445	415	409	303	
Copper	ug/L	<10	<10	<10	11	11	<10	<10	<10	<10	
Hardness, Total	mg/L	216	216	228	228	224	244	224	219	205	
Iron	ug/L	415	163	194	147	134	241	357	530	508	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	24	27	28	28	27	26	26	26	25	
Manganese	ug/L	230	55	92	66	61	52	66	87	93	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40	<40	
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	0.17	0.17	0.21	<0.10	<0.10	<0.10	
Nitrite	mg/L	0.02	<0.020	<0.020	0.022	0.024	<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	4	5	6	6	6	2	3	3	4	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	53	8	10	10	10	<5	5	5	5	
Strontium	ug/L	119	248	314	348	343	91	89	89	84	
TKN	mg/L	0.76	0.55	0.57	0.71	0.73	<0.20	0.31	<0.20	0.32	
Total Dissolved Solids	mg/L	414	254	268	282	282	266	232	232	228	
Total Phosphorus	mg/L	0.015	0.012	0.027	0.03	0.029	<0.010	<0.010	0.013	<0.010	
Total Suspended Solids	mg/L	25	20	19	7	7	5	7	15	22	
Zinc	ug/L	12	<10	<10	<10	<10	<10	16	<10	<10	
Field Measurements											
Temperature	°C	24.23	28.38	31.27	21.92	21.92	23.18	25.23	26.82	19.29	
Conductivity	µmhos/cm	413.5	404.6	433	420.9	420.9	451.7	374.6	406	358.3	
D.O. Saturation	%	82.6	83	118.6	79	79	93.5	72.9	67.5	70.7	
Dissolved Oxygen	mg/L	6.91	6.45	8.76	6.92	6.92	7.99	5.99	5.39	6.51	
pH	S.U.	8.02	8.29	8.49	8.08	8.08	8.08	8.09	7.99	8.08	

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek dst. Elk Run** River Mile: 47.16 Storet: 300294					Site Location: **Ohio Brush Creek @ Heron Rd Ford (TR 115)** River Mile: 45.14 Storet: X04S22				
Parameter	Units	6/25/2007 1:33 PM	7/30/2007 1:23 PM	8/8/2007 12:36 PM	9/12/2007 1:06 PM		6/25/2007 2:00 PM	7/30/2007 1:43 PM	8/8/2007 12:49 PM	9/12/2007 1:23 PM	
Aluminum	ug/L	<200	235	6120	2040		<200	222	<200	268	
Ammonia	mg/L	<0.050	<0.050	0.063	0.073		<0.050	<0.050	<0.050	0.098	
Arsenic	ug/L	2.1	<2.0	5.2	5.3		<2.0	<2.0	2	2.5	
BOD5	mg/L	<2.0	NA	NA	6		<2.0	NA	NA	<2.0	
Barium	ug/L	51	49	114	55		42	52	55	59	
CBOD5	mg/L	<2.0	<2.0	3.7	4.2		<2.0	<2.0	<2.0	<2.0	
COD	mg/L	22	15	21	31		24	12	11	10	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	46	38	77	57		44	46	43	39	
Chloride	mg/L	10.4	12.3	14.8	11		10.1	12.3	13.2	15.6	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	407	371	430	315 RC		398	419	411	307	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	218	194	316	200		209	222	214	200	
Iron	ug/L	310	460	9570	3050		350	364	262	480	
Lead	ug/L	<2.0	<2.0	6.7	2.4		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	25	24	30	14		24	26	26	25	
Manganese	ug/L	66	81	1290	483		66	62	61	65	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	0.1		<0.10	<0.10	<0.10	0.13	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	2	3	4	8		3	3	3	4	
Selenium	ug/L	<2.0	<2.0	<4.0 UJ	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	5	6	7	5		5	6	6	7	
Strontium	ug/L	83	78	103	75		82	91	93	92	
TKN	mg/L	0.55	0.54	0.65	0.78		<0.20	0.37	0.28	0.59	
Total Dissolved Solids	mg/L	226	218	220 RC	314 RC		224	242	250	228	
Total Phosphorus	mg/L	0.019	0.013	0.096	0.072		<0.010	0.012	0.02	0.054	
Total Suspended Solids	mg/L	10	12	412	97		6	9	13	11	
Zinc	ug/L	<10	<10	21	14		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	26.63	29.36	31.75	26.18		25.5	28.37	32.38	24.83	
Conductivity	µmhos/cm	408.7	355	380	373.7		405.6	393.1	413.9	358.4	
D.O. Saturation	%	99.3	102.6	95	61.4		84.4	77.2	73.6	80.8	
Dissolved Oxygen	mg/L	7.96	7.84	6.97	4.96		6.91	6	5.34	6.7	
pH	S.U.	8.19	8.08	8.27	8.18		8.17	8.19	8.2	8.1	

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek @ SR 73 AT Serpent Mound** River Mile: 40.40 Storet: X04G01									
Parameter	Units	12/19/2006 10:07 AM	1/23/2007 9:50 AM	2/26/2007 11:37 AM	3/21/2007 10:48 AM	4/9/2007 10:05 AM	5/29/2007 10:40 AM	6/25/2007 2:18 PM	7/30/2007 2:28 PM	Dup A/B 8/8/2007 1:02 PM	Dup A/B 9/12/2007 1:32 PM
Aluminum	ug/L	<200	<200	1360	<200	<200	<200	<200	<200	<200/<200	229/248
Ammonia	mg/L	<0.050	<0.050	0.054	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050/<0.05	<0.050/<0.05
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2/<2.0	2.6/2.6
BOD5	mg/L	NA	NA	NA	NA	NA	NA	<2.0	NA	NA	3/2.9
Barium	ug/L	44	39	40	39	39	61	67	70	73/73	79/80
CBOD5	mg/L	NA	NA	NA	NA	NA	NA	<2.0	<2.0	<2.0/<2.0	2/<2.0
COD	mg/L	<10	13	12	<10	<10	14	16	15	11.0/11.0	15/18
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20/<0.20
Calcium	mg/L	59	57	32	54	53	54	49	46	48/47	48/48
Chloride	mg/L	10.7	8.9	9.1	10.2	8.2	10.7	11.8	11.3	12.4/12.2	14.7/14.6
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30	<30<30	<30<30
Conductivity	µmhos/cm	469	439	241	352	333	475	428	412	421/422	328/328
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10<10	<10<10
Hardness, Total	mg/L	263	245	138	238	235	254	225	214	223/216	227/227
Iron	ug/L	116	188	1940	173	128	260	198	233	245/227	383/413
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0/<2.0
Magnesium	mg/L	28	25	14	25	25	29	25	24	25/24	26/26
Manganese	ug/L	16	20	67	18	22	64	38	48	55/55	90/91
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20/<0.20
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40	<40/<40	<40/<40
Nitrate+nitrite	mg/L	0.15	0.74	0.98	0.24	0.33	0.11	0.17	0.18	<0.10<0.10	<0.10<0.10
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020/<0.02	<0.020/<0.02
Potassium	mg/L	2	2	3	2	<2	3	3	4	4.0/ 4.0	4.0/ 4.0
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0/<2.0
Sodium	mg/L	6	5	<5	6	5	6	6	7	8.0/7.0	8.0/8.0
Strontium	ug/L	86	73	46	76	73	92	90	83	89/88	90/91
TKN	mg/L	0.2	0.22	0.57	<0.20	0.3	<0.20	0.26	0.32	0.29/0.31	0.43/0.48
Total Dissolved Solids	mg/L	286	244	150	256	242	268	242	234	246/240	264/262
Total Phosphorus	mg/L	0.206	0.019	0.089	0.014	<0.010	0.013	<0.010	<0.010	0.014/0.016	0.019/0.18
Total Suspended Solids	mg/L	<5	53	50	5	<5	<5	5	6	5/<5	12.0/12/0
Zinc	ug/L	<10	<10	14	<10	<10	<10	<10	<10	<10/<10	<10/<10
Field Measurements											
Temperature	°C	NA	2.13	3.59	9.48	5.05	24.17	25.46	27.83	30.1	23.66
Conductivity	µmhos/cm	NA	455.3	288.7	394.9	446.7	430	431.5	386.1	416.1	405.2
D.O. Saturation	%	NA	121.1	102.3	118.6	109.7	95.6	90.8	93.3	80.5	76.6
Dissolved Oxygen	mg/L	NA	16.67	13.55	13.54	13.98	8.02	7.44	7.32	6.07	6.48
pH	S.U.	NA	8.15	8.22	8.33	8.28	8.07	8.13	8.21	8.13	8.23

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek dst. Shimer Run** River Mile: 30.5 Storet: X04S20					Site Location: **Ohio Brush Creek dst. Hillcrest Nursing Home** River Mile: 28.8 Storet: 300292				
Parameter	Units	6/25/2007 5:49 PM	7/30/2007 1:36 PM	8/8/2007 12:58 PM	9/12/2007 2:56 PM		7/30/2007 1:38 PM	8/8/2007 1:00 PM			
Aluminum	ug/L	<200	218	356	<200		239	276			
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050			
Arsenic	ug/L	<2.0	<2.0	2	2.3		<2.0	2			
BOD5	mg/L	<2.0	NA	NA	<2.0		NA	NA			
Barium	ug/L	56	60	64	68		60	62			
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0			
COD	mg/L	21	<10	<10	19		<10	<10			
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20			
Calcium	mg/L	48	45	41	37		44	41			
Chloride	mg/L	15.4	14	18.4	31.8		14.2	18.1			
Chromium	ug/L	<30	<30	<30	<30		<30	<30			
Conductivity	µmhos/cm	474	425	421	349		423	420			
Copper	ug/L	<10	<10	<10	<10		<10	<10			
Hardness, Total	mg/L	235	215	209	199		209	209			
Iron	ug/L	198	404	511	240		378	386			
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0			
Magnesium	mg/L	28	25	26	26		24	26			
Manganese	ug/L	36	53	80	62		52	62			
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20			
Nickel	ug/L	<40	<40	<40	<40		<40	<40			
Nitrate+nitrite	mg/L	<0.10	0.11	<0.10	0.2		0.1	<0.10			
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020			
Potassium	mg/L	3	3	4	5		3	4			
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0			
Sodium	mg/L	9	8	11	19		8	11			
Strontium	ug/L	86	84	88	87		83	86			
TKN	mg/L	1.16	0.3	2.39	0.57		0.26	<0.20			
Total Dissolved Solids	mg/L	262	246	252	288		238	260			
Total Phosphorus	mg/L	0.067	0.103	0.103	0.067		0.01	0.011			
Total Suspended Solids	mg/L	6	13	19	9		8	8			
Zinc	ug/L	22	<10	<10	<10		<10	<10			
Field Measurements											
Temperature	°C	26.24	26.02	28.57	22.58		26.24	28.65			
Conductivity	µmhos/cm	472.5	432	442.1	437.5		433.1	439.4			
D.O. Saturation	%	112.1	83.5	71	74.8		79.7	70.7			
Dissolved Oxygen	mg/L	9.04	6.77	5.5	6.46		6.44	5.47			
pH	S.U.	8.23	8.08	8.1	8.19		8.01	8.02			

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek adj. Lawshe Rd SW of Peebles** River Mile: 25.0 Storet: X04S19					Site Location: **Ohio Brush Creek @ Fawcett Rd.** River Mile: 21.35 Storet: 300291				
Parameter	Units	6/25/2007 10:13 AM	Dup. A 7/30/2007 3:25 PM	Dup. B 7/30/2007 3:25 PM	8/8/2007 3:22 PM	9/12/2007 2:25 PM	6/25/2007 10:31 AM	7/30/2007 3:11 PM	8/8/2007 3:05 PM	9/12/2007 2:11 PM	
Aluminum	ug/L	<200	215	214	226	321	270	245	213	252	
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050	0.059	<0.050	<0.050	<0.050	<0.050	
Arsenic	ug/L	<2.0	<2.0	<2.0	2.3	2.4	<2.0	<2.0	2	2.4	
BOD5	mg/L	<2.0	NA	NA	NA	<2.0	<2.0	NA	NA	<2.0	
Barium	ug/L	58	58	57	53	57	59	61	58	68	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
COD	mg/L	22	<10	12	15	13	25	34	11	18	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	52	42	41	37	34	55	44	41	40	
Chloride	mg/L	14.2	17.3	17.6	23.3	29.3	14.7	25.4	17.6	23.6	
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30	<30	
Conductivity	µmhos/cm	465	408	409	406	315	472	443	409	324	
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Hardness, Total	mg/L	245	200	193	175	180	261	204	197	203	
Iron	ug/L	279	349	332	388	567	424	395	378	435	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3	<2.0	<2.0	
Magnesium	mg/L	28	23	22	20	23	30	23	23	25	
Manganese	ug/L	75	67	67	73	113	68	57	58	70	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40	<40	
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	3	4	4	4	4	3	4	4	4	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	8	9	9	11	13	8	13	10	11	
Strontium	ug/L	96	90	88	91	98	103	98	90	102	
TKN	mg/L	0.35	0.36	0.45	0.32	0.43	<0.20	0.44	0.33	0.38	
Total Dissolved Solids	mg/L	266	234	236	236	250	272	250	244	258	
Total Phosphorus	mg/L	0.011	<0.010	0.01	0.02	0.025	0.01	0.015	0.014	0.021	
Total Suspended Solids	mg/L	10	11	12	12	23	10	10	9	15	
Zinc	ug/L	<10	<10	<10	<10	<10	<10	11	<10	<10	
Field Measurements											
Temperature	°C	23.44	29.73	29.73	33.57	22.66	23.24	28.37	31.66	24.47	
Conductivity	µmhos/cm	474.5	356.4	356.4	366.1	377.6	485.4	388.4	366.7	398	
D.O. Saturation	%	85.9	119	119	110.5	86.4	72.3	100.2	94.8	74.1	
Dissolved Oxygen	mg/L	7.3	9.03	9.03	7.86	7.45	6.17	7.79	6.96	6.18	
pH	S.U.	8.02	8.4	8.4	8.36	8.25	7.84	8.26	8.3	8.21	

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek @ End of TR 84** River Mile: 15.2 Storet: X04S18						Site Location: **Ohio Brush Cr. @ SR 125** River Mile: 10.0 Storet: 600650			
Parameter	Units	Dup. A 6/25/2007 4:20 PM	Dup. B 6/25/2007 4:20 PM	7/30/2007 12:51 PM	8/8/2007 12:23 PM	Dup. A 9/12/2007 10:26 AM	Dup. B 9/12/2007 10:26 AM	6/25/2007 3:32 PM	7/30/2007 12:12 PM	8/8/2007 12:45 PM	9/12/2007 11:06 AM
Aluminum	ug/L	<200	<200	300	218	<200	311	<200	206	213	<200
Ammonia	mg/L	<0.050	<0.050	<0.050	0.07	0.072	<0.050	<0.050	<0.050	<0.050	<0.050
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2	<2.0	<2.0	<2.0	2
BOD5	mg/L	<2.0	<2.0	NA	NA	<2.0	<2.0	<2.0	NA	NA	<2.0
Barium	ug/L	51	48	57	50	51	54	56	54	59	60
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.4	<2.0
COD	mg/L	31	33	12	11	13	13	32	12	11	12
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Calcium	mg/L	55	53	45	39	37	38	59	44	45	38
Chloride	mg/L	15.1	14.8	16.3	17.2	20.2	20.2	14.4	13.3	15.4	20
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Conductivity	µmhos/cm	463	454	434	383	309 B	308	474	423	425	323 B
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Hardness, Total	mg/L	257	248	219	184	199	202	267	217	219	214
Iron	ug/L	238	224	546	354	156	659	210	321	382	257
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Magnesium	mg/L	29	28	26	21	26	26	29	26	26	29
Manganese	ug/L	37	36	78	43	49	116	31	40	52	39
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.2
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Potassium	mg/L	3	3	3	3	4	4	3	3	3	4
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	mg/L	8	8	9	9	10	10	7	7	9	10
Strontium	ug/L	102	97	88	84	92	92	103	82	88	93
TKN	mg/L	0.28	0.24	0.31	0.37	0.34	0.35	<0.20	0.34	0.58	0.29
Total Dissolved Solids	mg/L	260	264	248	212	244	240	282	264	258	262
Total Phosphorus	mg/L	0.012	<0.010	0.012	0.013	0.017	0.018	<0.010	<0.010	0.016	0.021
Total Suspended Solids	mg/L	7	7	19	8	40	42	<5	7	11	9
Zinc	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	20	<10
Field Measurements											
Temperature	°C	29.17	29.17	27.37	31.27	17.81	17.81	27.84	28.09	30.75	22.32
Conductivity	µmhos/cm	479.9	479.9	379.4	336.9	366.6	366.6	506	374.2	387.3	398.4
D.O. Saturation	%	141.5	141.5	108.5	112.2	61.4	61.4	89.9	91.9	70.9	69.2
Dissolved Oxygen	mg/L	10.84	10.84	8.58	8.29	5.83	5.83	7.05	7.18	5.29	6.01
pH	S.U.	8.2	8.2	8.28	8.28	8.1	8.1	8.08	8.31	8.08	8.28

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek @ SR 348 NR West Union** River Mile: 13.16 Storet: 600660									
Parameter	Units	12/19/2006 11:09 AM	1/23/2007 11:43 AM	2/26/2007 1:33 PM	3/21/2007 12:02 PM	4/9/2007 11:12 AM	5/29/2007 12:11 PM	Dup A/B 6/25/2007 3:51 PM	7/30/2007 12:24 PM	8/8/2007 1:00 PM	Dup A/B 9/12/2007 10:48 AM
Aluminum	ug/L	<200	232	2560	<200	<200	<200	<200/<200	<200	267	<200/207
Ammonia	mg/L	<0.050	<0.050	0.072	<0.050	<0.050	<0.050	<0.050/<0.05	<0.050	<0.050	0.061/0/064
Arsenic	ug/L	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0/<2.0
BOD5	mg/L	<2.0	<2.0	2.2	<2.0	NA	NA	<2.0/<2.0	NA	NA	<2.0/<2.0
Barium	ug/L	42	37	41	36	37	49	53/52	57	60	63/68
CBOD5	mg/L	NA	NA	NA	NA	NA	NA	<2.0/<2.0	<2.0	<2.0	<2.0/<2.0
COD	mg/L	<10	17	92	<10	<10	10	13/10	15	16	12/15.0
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20	<0.20/<0.20
Calcium	mg/L	62	60	36	57	59	58	57/56	47	45	52/55
Chloride	mg/L	14.4	10.4	11	13.9	9.4	12.5	13.6/13.5	15	19.4	17.5/16.9
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30/<30	<30	<30	<30/<30
Conductivity	µmhos/cm	468	457	245	371	373	492	475/480	445	428	345/343
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10/<10	<10	<10	<10/<10
Hardness, Total	mg/L	262	249	143	241	246	260	262/255	224	211	245/257
Iron	ug/L	205	388	3100	206	156	159	162/157	286	535	213/338
Lead	ug/L	<2.0	<2.0	3	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	3.5	<2.0/<2.0
Magnesium	mg/L	26	24	13	24	24	28	29/28	26	24	28/29
Manganese	ug/L	15	17	121	18	22	53	25/24	44	60	30/50
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20	<0.20/<0.20
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40/<40	<40	<40	<40/<40
Nitrate+nitrite	mg/L	0.15	0.96	0.97	0.26	0.38	<0.10	<0.10/<0.10	<0.10	0.16	0.14/0.17
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020/<0.02	<0.020	0.04	<0.020/<0.02
Potassium	mg/L	3	2	3	2	2	3	3.0/3.0	3	4	3.0/3.0
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0/<2.0
Sodium	mg/L	7	6	5	7	5	7	7.0/7.0	8	10	8/8.0
Strontium	ug/L	103	88	51	85	84	99	99/98	89	89	101/105
TKN	mg/L	0.3	0.25	0.69	0.35	0.6	<0.20	0.26/0.23	0.3	0.41	0.3/0/32
Total Dissolved Solids	mg/L	284	244	180	276	272	284	280/278	278	262	290/288
Total Phosphorus	mg/L	0.023	0.04	0.095	0.011	0.043	<0.010	<0.010/<0.01	<0.010	0.017	0.022/0.023
Total Suspended Solids	mg/L	<5	<5	97	5	<5	5	<5/<5	6	15	14/14
Zinc	ug/L	<10	<10	18	<10	<10	<10	<10/<10	<10	63	<10/<10
Field Measurements											
Temperature	°C	NA	2.44	4.78	10.33	6.05	27.26	28.67	27.03	30.99	22.4
Conductivity	µmhos/cm	NA	475	271.5	417.5	471.4	451.4	500.1	388.8	384.3	440.3
D.O. Saturation	%	NA	121.1	110.8	119	109.1	106.7	85.6	88	78.5	68.2
Dissolved Oxygen	mg/L	NA	16.53	14.22	13.32	13.54	8.46	6.62	7.01	5.83	5.91
pH	S.U.	NA	8.31	8.06	8.42	8.32	8.14	8.01	8.15	8.02	8.21

Appendix Table 1. Continued.

		Site Location: **Ohio Brush Creek dst. Beasley Fork** River Mile: 6.0 Storet: X04S17					Site Location: **Ohio Brush Creek @ US Rt. 52** River Mile: 0.5 Storet: 300290				
Parameter	Units	6/25/2007 2:34 PM	7/30/2007 10:32 AM	8/8/2007 10:13 AM	9/12/2007 11:41 AM		6/25/2007 2:56 PM	7/30/2007 10:13 AM	8/8/2007 9:51 AM	9/12/2007 12:01 PM	
Aluminum	ug/L	<200	411	<200	225		<200	<200	<200	214	
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050	0.056	0.163	0.162	
Arsenic	ug/L	<2.0	<2.0	2.1	2.3		<2.0	<2.0	<2.0	<2.0	
BOD5	mg/L	<2.0	NA	NA	<2.0		<2.0	NA	NA	<2.0	
Barium	ug/L	59	56	57	71		61	64	62	58	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	2.5	<2.0	<2.0	
COD	mg/L	14	12	15	15		27	<10	<10	12	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	63	47	47	52		41	40	38	44	
Chloride	mg/L	14.9	14.6	20.5	20.2		37.6	50.1	42.1	46.7	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	518	449	464	353		465	522	488	435	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	281	228	224	249		168	162	157	168	
Iron	ug/L	235	680	315	462		190	247	181	470	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	30	27	26	29		16	15	15	14	
Manganese	ug/L	68	72	113	101		54	35	26	76	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	<0.10	0.11	0.14	0.3		0.36	0.78	0.58	0.87	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	0.044	
Potassium	mg/L	3	3	4	4		3	3	3	4	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	8	8	12	11		30	38	35	34	
Strontium	ug/L	108	88	95	107		346	330	327	335	
TKN	mg/L	0.21	0.33	0.36	0.36		<0.20	0.5	0.53	0.44	
Total Dissolved Solids	mg/L	296	264	264	300		274	308	292	314	
Total Phosphorus	mg/L	<0.010	0.013	0.031	0.045		0.014	0.019	0.024	0.033	
Total Suspended Solids	mg/L	5	20	12	15		7	<5	<5	17	
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	26.62	25.73	29.04	23.65		28.94	27.04	29.34	26.64	
Conductivity	µmhos/cm	533.5	391	416	454		481.6	457.8	430.5	468.1	
D.O. Saturation	%	85	80.4	79.6	64.8		86.5	80.6	59.4	71.4	
Dissolved Oxygen	mg/L	6.81	6.55	6.11	5.49		6.65	6.41	4.54	5.72	
pH	S.U.	8.09	8.14	8.11	7.99		7.95	7.99	7.8	8.21	

Appendix Table 1. Continued.

		Site Location: **SHIMER RUN JUST DST PEEBLES WWTP** River Mile: 2.18 Storet: X04S32					Site Location: **BEASLEY FK DST West Union WWTP, UST Landfill** River Mile: 5.8 Storet: 300296				
Parameter	Units	6/25/2007 4:35 PM	7/30/2007 3:20 PM	8/8/2007 1:48 PM	9/12/2007 2:17 PM		6/25/2007 1:19 PM	7/30/2007 11:36 AM	8/8/2007 11:34 AM	9/12/2007 12:42 PM	
Aluminum	ug/L	<200	1220	599	318		<200	<200	<200	<200	
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	<0.050	
Arsenic	ug/L	3.5	4.2	3.5	5.7		3.1	3.3	3.1	3.8	
BOD5	mg/L	<2.0	NA	NA	<2.0		<2.0	NA	NA	<2.0	
Barium	ug/L	62	73	62	66		29	38	35	27	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
COD	mg/L	32	12	15	16		41	15	15	24	
Cadmium	ug/L	<0.20	<0.20	<0.20	0.31		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	67	73	59	70		63	72	67	63	
Chloride	mg/L	63.8	54.3	47.8	66.3		90.8	73.6	78.2	111	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	736	709	597	726		815	799	759	858 B	
Copper	ug/L	<10	<10	<10	<10		10	<10	<10	18	
Hardness, Total	mg/L	311	322	263	302		264	299	274	256	
Iron	ug/L	231	2600	1300	644		200	174	186	186	
Lead	ug/L	<2.0	3.6	2.1	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	35	34	28	31		26	29	26	24	
Manganese	ug/L	27	321	147	107		11	<10	<10	10	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.29	1.51	2.08	0.11		11	8.56	9.14	25.8	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	0.031	
Potassium	mg/L	7	7	6	11		12	8	9	16	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	41	34	31	48		65	46	51	82	
Strontium	ug/L	119	122	104	134		171	162	162	182	
TKN	mg/L	0.39	0.43	0.45	0.79		1.41	0.84	1.09	2.2	
Total Dissolved Solids	mg/L	436	420	380	454		526	476	494	576	
Total Phosphorus	mg/L	0.222	0.387	0.38	0.593		3.27	1.75	2.14	4.81	
Total Suspended Solids	mg/L	10	68	<5	39		7	5	8	8	
Zinc	ug/L	12	19	11	23		32	20	27	47	
Field Measurements											
Temperature	°C	26.78	27.46	30.62	21.66		24.78	24.04	26.95	20.27	
Conductivity	µmhos/cm	731.6	656	599.4	691.3		849.5	691.8	683.7	834.8	
D.O. Saturation	%	99.6	98.8	87.7	95.3		89.9	99.8	100.2	105.4	
Dissolved Oxygen	mg/L	7.96	7.79	6.55	8.37		7.44	8.38	7.98	9.51	
pH	S.U.	8.63	8.59	8.51	8.45		8.28	8.39	8.42	8.38	

Appendix Table 1. Continued.

		Site Location: **BEASLEY FK ADJ SR 247 DST WEST UNION** River Mile: 4.6 Storet: X04S24					Site Location: **BEASLEY FK @ SR 247 DST WEST UNION** River Mile: 3.2 Storet: X04S10				
Parameter	Units	6/25/2007 1:35 PM	7/30/2007 11:26 AM	8/8/2007 11:21 AM	9/12/2007 12:00 AM		6/25/2007 1:57 PM	7/30/2007 10:58 AM	8/8/2007 10:42 AM	9/12/2007 12:29 PM	
Aluminum	ug/L	286	219	<200	<200		302	326	328	279	
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	0.054	<0.050	
Arsenic	ug/L	5.3	3.8	3.7	5.9		6.3	3.2	4	7	
BOD5	mg/L	<2.0	NA	NA	<2.0		<2.0	NA	NA	<2.0	
Barium	ug/L	35	41	36	34		45	43	43	51	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	3.9	<2.0	
COD	mg/L	35	12	11	16		30	15	21	18	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	63	72	64	62		58	60	57	66	
Chloride	mg/L	94.7	65.6	57.6	103		78.7	45.6	41.2	114	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	809	757	670	861		721	622	581	854	
Copper	ug/L	<10	<10	<10	15		<10	<10	<10	<10	
Hardness, Total	mg/L	264	299	263	254		252	257	245	280	
Iron	ug/L	525	348	300	151		477	507	539	533	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	26	29	25	24		26	26	25	28	
Manganese	ug/L	17	17	14	<10		29	26	32	47	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	10.1	6.64	4.89	23.4		2.77	2.56	1.44	9.39	
Nitrite	mg/L	<0.020	<0.020	<0.020	0.026		<0.020	<0.020	<0.020	0.038	
Potassium	mg/L	13	8	8	16		10	6	7	12	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	70	41	39	80		56	27	27	81	
Strontium	ug/L	169	166	154	173		183	154	156	229	
TKN	mg/L	0.93	0.77	0.71	1.09		1.14	0.68	0.57	0.78	
Total Dissolved Solids	mg/L	530	456	416	578		438	376	352	570	
Total Phosphorus	mg/L	3.12	1.24	1.58	4.14		1.19	0.596	0.782	1.26	
Total Suspended Solids	mg/L	33	13	9	17		31	39	21	15	
Zinc	ug/L	28	19	38	37		<10	<10	11	13	
Field Measurements											
Temperature	°C	23.94	23.53	27.38	19.97		27.12	25.31	28.46	22.21	
Conductivity	µmhos/cm	861.2	653.4	603.4	831.5		747	536.6	515.7	835	
D.O. Saturation	%	101.1	101.9	98.2	97.2		116.3	111.2	94.9	104.3	
Dissolved Oxygen	mg/L	8.5	8.64	7.76	8.83		9.23	9.12	7.36	9.07	
pH	S.U.	8.33	8.28	8.28	8.22		8.63	8.37	8.28	8.49	

Appendix Table 1. Continued.

		Site Location: **BEASLEY FK @ FORD NR MOUTH** River Mile: 0.75 Storet: X04S23					Site Location: **Trib. to Beasley Fork (RM 4.60)** River Mile: 0.17 Storet: 300297				
Parameter	Units	6/25/2007 2:23 PM	7/30/2007 10:47 AM	Dup. A 8/8/2007 10:26 AM	Dup. B 8/8/2007 10:26 AM	9/12/2007 11:28 AM	6/25/2007 1:44 PM	7/30/2007 11:21 AM	8/8/2007 11:04 AM		
Aluminum	ug/L	<200	466	237	394	<200	249	494	320		
Ammonia	mg/L	<0.050	<0.050	0.05	<0.050	<0.050	<0.050	<0.050	<0.050		
Arsenic	ug/L	<2.0	<2.0	2.7	2.9	2.4	<2.0	<2.0	<2.0		
BOD5	mg/L	<2.0	NA	NA	NA	<2.0	<2.0	NA	NA		
Barium	ug/L	62	49	55	56	80	56	48	52		
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
COD	mg/L	28	<10	11	11	10	27	15	11		
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
Calcium	mg/L	72	55	57	58	75	57	52	53		
Chloride	mg/L	72.1	34.1	45.9	45.3	49.8	15	16.7	15.4		
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30		
Conductivity	µmhos/cm	749	550	597	598	660 B	538	490	490		
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10		
Hardness, Total	mg/L	324	236	249	252	319	290	245	252		
Iron	ug/L	260	688	458	883	698	384	620	465		
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Magnesium	mg/L	35	24	26	26	32	36	28	29		
Manganese	ug/L	171	130	146	200	516	38	32	36		
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40		
Nitrate+nitrite	mg/L	<0.10	1.14	1.07	1.11	<0.10	0.13	0.89	0.19		
Nitrite	mg/L	<0.020	<0.020	0.02	0.02	<0.020	<0.020	<0.020	<0.020		
Potassium	mg/L	5	5	6	6	4	4	5	5		
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		
Sodium	mg/L	39	21	29	29	28	7	9	8		
Strontium	ug/L	138	115	132	133	133	126	100	108		
TKN	mg/L	0.36	0.39	0.41	0.35	0.25	0.35	0.42	0.23		
Total Dissolved Solids	mg/L	430	312	360	358	410	334	296	304		
Total Phosphorus	mg/L	0.01	0.085	0.207	0.207	0.011	0.016	0.036	0.021		
Total Suspended Solids	mg/L	<5	17	9	9	12	17	16	12		
Zinc	ug/L	<10	<10	<10	<10	<10	<10	<10	<10		
Field Measurements											
Temperature	°C	25.99	23.73	26.9	26.9	19.04	24.06	24.38	27.96		
Conductivity	µmhos/cm	775.8	476	531.1	531.1	628.8	558.7	424.8	436.9		
D.O. Saturation	%	87.3	74.3	55	55	47	99.4	96	77		
Dissolved Oxygen	mg/L	7.07	6.26	4.39	4.39	4.35	8.34	8.01	6.02		
pH	S.U.	7.85	7.79	7.82	7.82	7.84	8.06	8.19	8.1		

Appendix Table 1. Continued.

		Station Location: **Moores Run at St. RT. 247** River Mile: 0.2 Storet: 300310					Site Location: **CEDAR RUN JUST UPST STARLEY-GUSTIN RD (TR 58A)** River Mile: 0.38 Storet: X04P10				
Parameter	Units	6/25/2007 2:09 PM	Dup. A 7/30/2007 11:12 AM	Dup. B 7/30/2007 11:12 AM	8/8/2007 10:49 AM		6/25/2007 4:04 PM	7/30/2007 12:32 PM	8/8/2007 1:09 PM		
Aluminum	ug/L	<200	476	462	333		<200	309	294		
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	<0.050		
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
BOD5	mg/L	<2.0	NA	NA	NA		<2.0	NA	NA		
Barium	ug/L	51	46	46	51		96	105	109		
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
COD	mg/L	27	12	<10	11		10	28	<10		
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20		
Calcium	mg/L	54	51	50	52		50	52	52		
Chloride	mg/L	55.4	24.1	23.9	20		7.4	12.9	11.7		
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30		
Conductivity	µmhos/cm	640	510	509	498		450	479	481		
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10		
Hardness, Total	mg/L	283	243	236	245		244	253	253		
Iron	ug/L	271	574	596	514		246	372	425		
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
Magnesium	mg/L	36	28	27	28		29	30	30		
Manganese	ug/L	14	24	23	29		47	48	57		
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20		
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40		
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	<0.10		0.11	0.3	0.14		
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020		
Potassium	mg/L	5	5	5	5		3	3	3		
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
Sodium	mg/L	28	14	14	13		5	6	7		
Strontium	ug/L	327	237	235	244		72	74	75		
TKN	mg/L	0.44	0.27	0.29	<0.20		<0.20	0.21	<0.20		
Total Dissolved Solids	mg/L	390	306	308	306		256	274	282		
Total Phosphorus	mg/L	0.01	0.016	0.016	0.022		<0.010	<0.010	<0.010		
Total Suspended Solids	mg/L	7	9	9	16		<5	6	8		
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10		
Field Measurements											
Temperature	°C	25.87	24.53	24.53	29.63		25.76	24.69	28.62		
Conductivity	µmhos/cm	658.2	441.1	441.1	445		463.4	416.3	430.6		
D.O. Saturation	%	98.1	92.7	92.7	97.9		100.3	86.1	69.2		
Dissolved Oxygen	mg/L	7.96	7.72	7.72	7.44		8.17	7.15	5.35		
pH	S.U.	8.3	8.28	8.28	8.34		8.04	8.06	7.99		

Appendix Table 1. Continued.

		Site Location: **LICK FK NE OF WEST UNION, UPST. TRIBUTARY (4.02)** River Mile: 4.1 Storet: X99Q05					Site Location: **TRIB. TO LICK FK (RM 4.02) @ FARM LANE** River Mile: 2.8 Storet: 200704				
Parameter	Units	6/25/2007 12:00 PM	7/30/2007 2:21 PM	8/8/2007 2:08 PM	9/12/2007 1:40 PM		6/25/2007 12:25 PM	7/30/2007 2:04 PM	8/8/2007 12:24 PM		
Aluminum	ug/L	751	274	<200	565		<200	908	1420		
Ammonia	mg/L	0.053	0.061	<0.050	<0.050		8.72	14.9	35.8		
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0		3.1	10.9	24		
BOD5	mg/L	<2.0	NA	NA	4.4		3.5	NA	NA		
Barium	ug/L	60	67	93	62		183	332	2980		
CBOD5	mg/L	<2.0	<2.0	<2.0	3		<2.0	6.7	19		
COD	mg/L	34	15	98	16		57	88	130		
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20		
Calcium	mg/L	58	67	81	47		70	51	57		
Chloride	mg/L	77.4	13.2	24.8	62.7		76.4	79.2	94.2		
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30		
Conductivity	µmhos/cm	678	504	625	571 B		780	800	1080		
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10		
Hardness, Total	mg/L	277	250	305	224		286	206	245		
Iron	ug/L	1010	375	205	1030		270	3490	8730		
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	5.1	10.5		
Magnesium	mg/L	32	20	25	26		27	19	25		
Manganese	ug/L	205	114	588	166		1220	2150	4240		
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20		
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40		
Nitrate+nitrite	mg/L	<0.10	0.23	0.27	0.27		<0.10	0.22	0.11		
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		0.078	0.114	<0.020		
Potassium	mg/L	6	5	5	7		30	51	92		
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
Sodium	mg/L	39	8	16	33		22	26	36		
Strontium	ug/L	340	159	227	278		132	95	157		
TKN	mg/L	0.9	0.55	0.33	0.66		9.55	16.2	31.7		
Total Dissolved Solids	mg/L	418	320	404	348		432	436	604		
Total Phosphorus	mg/L	0.025	0.022	0.013	0.122		0.052	0.414	0.916		
Total Suspended Solids	mg/L	45	<5	<5	55		5	40	90		
Zinc	ug/L	<10	<10	<10	<10		<10	19	1150		
Field Measurements											
Temperature	°C	23.38	27.14	28.64	19.66		22.53	24.91	27.14		
Conductivity	µmhos/cm	707.2	438.4	567.1	529.4		805.1	697.9	959.2		
D.O. Saturation	%	71.9	100.2	68.2	81.8		41.5	49.8	20.2		
Dissolved Oxygen	mg/L	6.11	7.96	5.27	7.48		3.59	4.11	1.6		
pH	S.U.	7.77	7.92	7.74	8.17		7.75	7.9	7.98		

Appendix Table 1. Continued.

		Site Location: **LICK FORK JUST UPST VAUGHN RIDGE RD** River Mile: 1.03 Storet: X04P09									
				Dup. A/B						Dup. A/B	
		12/19/2006	1/23/2007	2/26/2007	3/21/2007	4/9/2007	5/29/2007	6/25/2007	7/30/2007	8/8/2007	9/12/2007
Parameter	Units	10:48 AM	11:18 AM	1:06 PM	11:37 AM	10:48 AM	11:43 AM	10:44 AM	3:02 PM	2:53 PM	2:00 PM
Aluminum	ug/L	<200	807	884/780	299	<200	200	200	344	<200/<200	<200
Ammonia	mg/L	<0.050	<0.050	<0.050<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050<0.05	0.13
Arsenic	ug/L	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0	2.1	2.3	<2.0/<2.0	2.2
BOD5	mg/L	<2.0	<2.0	<2.0/<2.0	<2.0	NA	NA	3.2	NA	NA	<2.0
Barium	ug/L	38	28	26/26	30	31	76	98	56	79/78	103
CBOD5	mg/L	NA	NA	NA	NA	NA	NA	<2.0	<2.0	<2.0/<2.0	<2.0
COD	mg/L	<10	20	14/14	148	<10	17	34	19	15/11	18
Cadmium	ug/L	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20
Calcium	mg/L	62	45	39/39	54	60	59	61	46	49/49	49
Chloride	mg/L	13.9	8.6	12.9/12.8	14.6	11.2	18	24.4	16.9	21.8/21.8	27.4
Chromium	ug/L	<30	<30	<30/<30	<30	<30	<30	<30	<30	<30/<30	<30
Conductivity	µmhos/cm	490	312	279279	366	367	543	559	411	457/462	354 B
Copper	ug/L	<10	<10	<10/<10	<10	<10	<10	<10	<10	<10/<10	<10
Hardness, Total	mg/L	270	191	163/163	234	265	279	288	201	217/217	229
Iron	ug/L	158	1140	1270/1080	407	179	446	421	536	368/347	366
Lead	ug/L	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0
Magnesium	mg/L	28	19	16/16	24	28	32	33	21	23/23	26
Manganese	ug/L	24	25	23/21	18	18	130	143	82	101/101	115
Mercury	ug/L	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20
Nickel	ug/L	<40	<40	<40/<40	<40	<40	<40	<40	<40	<40/<40	<40
Nitrate+nitrite	mg/L	0.86	0.44	0.82/0.83	0.11	0.15	<0.10	<0.10	<0.10	0.28/0.25	<0.10
Nitrite	mg/L	<0.020	<0.020	<0.020/<0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020/<0.02	<0.020
Potassium	mg/L	3	2	3.0/2.0	2	2	3	4	3	4/4.0	4
Selenium	ug/L	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0
Sodium	mg/L	7	<5	5/5.0	7	6	9	12	10	12/12.0	14
Strontium	ug/L	114	64	55/55	90	97	145	175	104	145/146	159
TKN	mg/L	0.22	0.45	0.59/0.63	0.54	0.4	0.21	0.33	0.5	0.38/0.4	0.58
Total Dissolved Solids	mg/L	300	222	188/176	278	284	310	332	242	278/278	294
Total Phosphorus	mg/L	0.019	0.046	0.039/0.042	0.013	0.013	0.011	0.014	0.015	0.012/<0.01	0.026
Total Suspended Solids	mg/L	<5	11	16/16	6	<5	11	13	10	7/6.0	10
Zinc	ug/L	<10	<10	<10/<10	<10	<10	<10	<10	<10	<10/<10	<10
Field Measurements											
Temperature	°C	NA	2.32	3.96	10.47	5.55	26.03	23.59	28.45	31.46	24.29
Conductivity	µmhos/cm	NA	356.6	312.2	410.5	501	493.2	571.9	359.2	409.4	449.7
D.O. Saturation	%	NA	121	101.7	116.1	106	72.2	66.9	86.4	74.5	63.4
Dissolved Oxygen	mg/L	NA	16.57	13.33	12.95	13.32	5.85	5.67	6.71	5.48	5.3
pH	S.U.	NA	8.37	8.16	8.4	8.39	7.87	8.03	8.13	7.98	8.11

Appendix Table 1. Continued.

		Site Location: **Trib. TO LICK FK (RM 4.02) NE of West Union @ Mouth** River Mile: 0.10 Storet: X99Q06					Site Location: **TREBER RUN @ SR 41 AT MOUTH** River Mile: 0.10 Storet: X04P12				
Parameter	Units	6/25/2007 11:43 AM	7/30/2007 2:30 PM	8/8/2007 2:16 PM			6/25/2007 11:00 AM	7/30/2007 2:51 PM	8/8/2007 2:46 PM		
Aluminum	ug/L	<200	244	<200			289	249	296		
Ammonia	mg/L	0.075	<0.050	<0.050			<0.050	<0.050	<0.050		
Arsenic	ug/L	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0		
BOD5	mg/L	<2.0	NA	NA			<2.0	NA	NA		
Barium	ug/L	64	61	106			67	72	76		
CBOD5	mg/L	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0		
COD	mg/L	42	15	11			25	<10	<10		
Cadmium	ug/L	<0.20	<0.20	<0.20			<0.20	<0.20	<0.20		
Calcium	mg/L	46	66	82			67	65	59		
Chloride	mg/L	54.4	11.4	20.7			23.6	11.3	14.9		
Chromium	ug/L	<30	<30	<30			<30	<30	<30		
Conductivity	µmhos/cm	528	491	620			572	555	520		
Copper	ug/L	<10	<10	<10			<10	<10	<10		
Hardness, Total	mg/L	218	243	304			303	286	267		
Iron	ug/L	185	351	212			458	343	584		
Lead	ug/L	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0		
Magnesium	mg/L	25	19	24			33	30	29		
Manganese	ug/L	201	52	403			136	69	114		
Mercury	ug/L	<0.20	<0.20	<0.20			<0.20	<0.20	<0.20		
Nickel	ug/L	<40	<40	<40			<40	<40	<40		
Nitrate+nitrite	mg/L	<0.10	0.24	<0.10			<0.10	<0.10	0.11		
Nitrite	mg/L	<0.020	<0.020	<0.020			<0.020	<0.020	<0.020		
Potassium	mg/L	4	4	5			5	5	5		
Selenium	ug/L	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0		
Sodium	mg/L	26	7	13			14	8	10		
Strontium	ug/L	150	155	215			297	239	261		
TKN	mg/L	0.83	0.41	0.31			0.21	0.4	0.26		
Total Dissolved Solids	mg/L	314	314	396			344	344	320		
Total Phosphorus	mg/L	0.019	0.012	0.032			0.019	0.01	0.017		
Total Suspended Solids	mg/L	<5	<5	<5			11	8	13		
Zinc	ug/L	<10	10	<10			<10	<10	10		
Field Measurements											
Temperature	°C	21.83	27.09	32.89			21.51	27.23	32.81		
Conductivity	µmhos/cm	541.4	428	564.5			587.5	483.6	479.3		
D.O. Saturation	%	55.1	93.5	98.6			59.4	92.5	100		
Dissolved Oxygen	mg/L	4.83	7.43	7.09			5.23	7.33	7.2		
pH	S.U.	7.67	7.95	7.76			7.74	8	8.05		

Appendix Table 1. Continued.

		Site Location: **CAVE RUN NEAR MOUTH, ADJ. GRAVEL LANE** River Mile: 0.10 Storet: X99Q07					Site Location: **Bundle Run @ Trail off SR 781 from Jackson** River Mile: 0.68 Storet: 300298				
Parameter	Units	6/25/2007 11:15 AM	7/30/2007 2:40 PM	8/8/2007 2:35 PM			6/25/2007 9:50 AM				
Aluminum	ug/L	458	<200	281			209				
Ammonia	mg/L	NA	<0.050	<0.050			<0.050				
Arsenic	ug/L	<2.0	2.2	<2.0			<2.0				
BOD5	mg/L	2.6	NA	NA			<2.0				
Barium	ug/L	65	49	57			87				
CBOD5	mg/L	2.1	<2.0	<2.0			<2.0				
COD	mg/L	NA	12	15			28				
Cadmium	ug/L	<0.20	<0.20	<0.20			<0.20				
Calcium	mg/L	51	49	50			62				
Chloride	mg/L	14	18.7	26.7			16.7				
Chromium	ug/L	<30	<30	<30			<30				
Conductivity	µmhos/cm	499	446	463			600				
Copper	ug/L	<10	<10	<10			<10				
Hardness, Total	mg/L	276	213	215			332				
Iron	ug/L	781	299	545			247				
Lead	ug/L	<2.0	<2.0	<2.0			<2.0				
Magnesium	mg/L	36	22	22			43				
Manganese	ug/L	146	69	86			47				
Mercury	ug/L	<0.20	<0.20	<0.20			<0.20				
Nickel	ug/L	<40	<40	<40			<40				
Nitrate+nitrite	mg/L	NA	0.11	<0.10			0.3				
Nitrite	mg/L	<0.020	<0.020	<0.020			<0.020				
Potassium	mg/L	4	3	4			4				
Selenium	ug/L	<2.0	<2.0	<2.0			<2.0				
Sodium	mg/L	5	10	15			7				
Strontium	ug/L	97	100	113			81				
TKN	mg/L	NA	0.35	0.34			<0.20				
Total Dissolved Solids	mg/L	300	268	274			356				
Total Phosphorus	mg/L	16	<0.010	0.013			0.033				
Total Suspended Solids	mg/L	NA	5	16			8				
Zinc	ug/L	<10	<10	85			<10				
Field Measurements											
Temperature	°C	21.73	27.95	31.73			20.51				
Conductivity	µmhos/cm	513.2	389.9	416.9			618.1				
D.O. Saturation	%	52.7	101.1	84.6			49.1				
Dissolved Oxygen	mg/L	4.63	7.92	6.2			4.41				
pH	S.U.	7.86	8.24	8.07			7.82				

Appendix Table 1. Continued.

		Site Location: **LITTLE EAST FK @ SR 74 NW OF PEEBLES** River Mile: 0.9 Storet: X04P04					Site Location: **LITTLE EAST FORK NW OF PEEBLES @ MOUTH** River Mile: 0.1 Storet: 200721				
Parameter	Units	6/25/2007 3:22 PM	7/30/2007 3:44 PM	8/8/2007 2:10 PM	9/12/2007 2:37 PM		6/25/2007 3:54 PM	7/30/2007 3:56 PM	8/8/2007 2:20 PM	9/12/2007 2:45 PM	
Aluminum	ug/L	<200	269	652	354		<200	254	545	1250	
Ammonia	mg/L	0.065	<0.050	<0.050	<0.050		0.067	<0.050	0.05	0.145	
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	4.4	
BOD5	mg/L	<2.0	NA	NA	<2.0		<2.0	NA	NA	7.2	
Barium	ug/L	56	32	43	49		133	56	93	141	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	4.4	
COD	mg/L	26	<10	<10	10		26	<10	<10	37	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	0.2	
Calcium	mg/L	61	46	50	49		80	67	83	52	
Chloride	mg/L	50.9	11.6	19.3	46.1		13.9	12.3	14	8.4	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	30	
Conductivity	µmhos/cm	615	409	459	547		574	527	554	305	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	10	
Hardness, Total	mg/L	264	197	215	213		319	278	331	212	
Iron	ug/L	137	319	672	496		321	456	590	2630	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	2.7	
Magnesium	mg/L	27	20	22	22		29	27	30	20	
Manganese	ug/L	94	14	34	46		1000	246	634	1020	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	0.2	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	40	
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	0.1		<0.10	<0.10	<0.10	0.39	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	0.023	
Potassium	mg/L	6	4	6	6		2	3	3	6	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	2	
Sodium	mg/L	31	8	16	31		7	7	8	5	
Strontium	ug/L	486	227	366	511		122	114	136	84	
TKN	mg/L	0.53	0.23	<0.20	0.32		<0.20	0.22	<0.20	1.49	
Total Dissolved Solids	mg/L	346	244	274	330		334	316	332	272	
Total Phosphorus	mg/L	<0.010	0.064	0.017	0.022		<0.010	<0.010	<0.010	0.295	
Total Suspended Solids	mg/L	<5	7	9	11		7	<5	230	77	
Zinc	ug/L	<10	<10	<10	<10		<10	<10	15	10	
Field Measurements											
Temperature	°C	26.44	28.07	30.91	21.94		25.99	26.23	30.35	22.09	
Conductivity	µmhos/cm	617.9	384.8	458.1	507.3		580.3	481.9	560.5	364.3	
D.O. Saturation	%	76.6	75.1	74	76		60.8	78.9	58	68.9	
Dissolved Oxygen	mg/L	6.15	5.87	5.5	6.64		4.92	6.37	4.35	6.01	
pH	S.U.	7.83	8.3	8.12	8.15		7.46	7.8	7.79	7.84	

Appendix Table 1. Continued.

		Site Location: **CROOKED CREEK NW OF LOCUST GROVE, UPST. SR 73** River Mile: 2.2 Storet: 200724					Site Location: **W. Fk Ohio Brush Cr. @ Heaton Rd.** River Mile: 20.53 Storet: 300300				
Parameter	Units	6/25/2007 2:31 PM	7/30/2007 2:41 PM	8/8/2007 1:13 PM	9/12/2007 1:44 PM		6/25/2007 11:49 AM	7/30/2007 9:07 AM	8/8/2007 9:35 AM	9/12/2007 10:39 AM	
Aluminum	ug/L	314	268	<200	<200		<200	233	<200	312	
Ammonia	mg/L	0.05	<0.050	0.057	0.345		<0.050	0.182	0.126	0.06	
Arsenic	ug/L	<2.0	<2.0	2.7	<2.0		2.6	2	3.2	2.5	
BOD5	mg/L	<2.0	NA	NA	2.4		2.3	NA	NA	6.2	
Barium	ug/L	90	100	108	125		70	57	67	69	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	4.8	
COD	mg/L	26	15	11	22		19	25	21	37	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	49	46	48	44		57	39	40	53	
Chloride	mg/L	28.4	30	31.6	39.2		25.6	24	27.1	5.8	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	538	518	520	524		539	370	390	301	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	271	242	256	242		245	147	158	174	
Iron	ug/L	543	418	224	296		164	334	284	477	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	36	31	33	32		25	12	14	10	
Manganese	ug/L	212	332	379	630		530	204	776	160	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.24	0.2	0.19	0.68		<0.10	0.8	<0.10	0.15	
Nitrite	mg/L	<0.020	<0.020	<0.020	0.126		<0.020	0.082	<0.020	0.053	
Potassium	mg/L	6	7	7	7		3	5	5	11	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	12	14	15	17		18	16	15	<5	
Strontium	ug/L	58	56	63	62		194	112	132	128	
TKN	mg/L	0.47	0.72	0.33	1.07		2.05	0.79	0.65	1.16	
Total Dissolved Solids	mg/L	298	296	300	320		308	228	234	260	
Total Phosphorus	mg/L	0.013	0.021	0.086	0.067		0.019	0.061	0.033	0.151	
Total Suspended Solids	mg/L	17	16	8	9		<5	5	<5	25	
Zinc	ug/L	<10	<10	<10	<10		<10	<10	16	<10	
Field Measurements											
Temperature	°C	23.76	26.13	29.89	21.91		21.67	22.11	25.33	15.82	
Conductivity	µmhos/cm	538	485.6	521.8	487.8		535.6	373.3	406.9	388.1	
D.O. Saturation	%	79.9	101.7	73.6	47.6		86.1	49.8	31.8	60.6	
Dissolved Oxygen	mg/L	6.75	8.22	5.57	4.17		7.57	4.34	2.61	5.99	
pH	S.U.	7.95	8.07	8.06	7.88		7.94	7.91	7.78	8.48	

Appendix Table 1. Continued.

		Site Location: **W. Fk Ohio Brush Cr @ Melblanc Rd.** River Mile: 17.92 Storet: 300299					Site Location: **W. Fk. Ohio Brush Cr. NR Winchester, Dst Turkey Run** River Mile: 15.6 Storet: 200716				
Parameter	Units	6/25/2007 11:30 AM	7/30/2007 9:37 AM	8/8/2007 9:48 AM	9/12/2007 10:51 AM		6/25/2007 11:13 AM	7/30/2007 9:48 AM	8/8/2007 10:01 AM	9/12/2007 11:05 AM	
Aluminum	ug/L	<200	1340	<200	458		<200	330	<200	<200	
Ammonia	mg/L	<0.050	0.094	0.168	<0.050		<0.050	<0.050	0.1	<0.050	
Arsenic	ug/L	2	2	2.3	3.1		2.5	<2.0	2.6	<2.0	
BOD5	mg/L	6.8	NA	NA	8.3		2.1	NA	NA	3.9	
Barium	ug/L	79	63	66	71		69	56	82	84	
CBOD5	mg/L	4.1	<2.0	<2.0	5.3		<2.0	<2.0	2.7	3.3	
COD	mg/L	36	22	15	31		25	15	15	22	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	54	38	42	40		49	50	51	46	
Chloride	mg/L	31.8	15.9	16.1	16.6		47.6	21.6	30.5	55.8	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	520	322	323	282		514	413	456	520	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	225	140	158	149		209	187	197	193	
Iron	ug/L	288	1760	324	765		170	482	447	351	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	22	11	13	12		21	15	17	19	
Manganese	ug/L	199	110	316	209		284	131	748	394	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.1	0.79	<0.10	<0.10		<0.10	0.4	<0.10	<0.10	
Nitrite	mg/L	<0.020	0.047	<0.020	<0.020		<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	4	6	6	6		4	6	6	5	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	17	8	9	9		25	12	16	32	
Strontium	ug/L	182	108	130	128		234	136	196	230	
TKN	mg/L	0.49	0.58	0.62	0.65		0.4	0.55	1.15	0.84	
Total Dissolved Solids	mg/L	292	210	204	212		284	242	262	294	
Total Phosphorus	mg/L	0.035	0.07	0.03	0.078		0.015	0.042	0.068	0.042	
Total Suspended Solids	mg/L	14	19	5	25		<5	15	14	15	
Zinc	ug/L	<10	10	<10	<10		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	20.94	22.26	25.73	18.15		22.68	22.57	26.88	16.12	
Conductivity	µmhos/cm	505.2	326.4	359.8	354.1		488.8	418.2	474.6	531.6	
D.O. Saturation	%	72	60	49.9	53.5		85.3	83	46	66.9	
Dissolved Oxygen	mg/L	6.42	5.22	4.06	5.04		7.35	7.17	3.67	6.58	
pH	S.U.	7.89	8	8.1	8.4		8.08	8.08	7.93	8.28	

Appendix Table 1. Continued.

		Site Location: **W FK OHIO BRUSH CK @ CR 37 NW OF SEAMAN** River Mile: 12.74 Storet: X04S28					Site Location: **W FK OHIO BRUSH CK - Upst. Little West Fork** River Mile: 10.5 Storet: X04S27				
Parameter	Units	6/25/2007 2:11 PM	7/30/2007 10:39 AM	8/8/2007 10:51 AM	9/12/2007 11:48 AM		6/25/2007 2:52 PM	7/30/2007 10:56 AM	8/8/2007 11:26 AM	9/12/2007 12:08 PM	
Aluminum	ug/L	<200	353	<200	265		<200	400	<200	<200	
Ammonia	mg/L	<0.050	<0.050	0.081	<0.050		<0.050	<0.050	0.055	0.08	
Arsenic	ug/L	<2.0	<2.0	<2.0	3.1		2.2	<2.0	<2.0	<2.0	
BOD5	mg/L	3.9	NA	NA	31		3	NA	NA	3.2	
Barium	ug/L	80	61	73	82		80	61	65	65	
CBOD5	mg/L	2.9	<2.0	<2.0	31		2.1	2.3	<2.0	2.1	
COD	mg/L	30	15	15	22		39	12	11	22	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	50	46	49	43		52	52	47	45	
Chloride	mg/L	34.4	21.6	24	35.4		32.4	12.4	23.6	50.7	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	477	382	407	369		477	396	358	384	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	207	168	188	177		212	200	175	174	
Iron	ug/L	236	576	198	460		337	860	201	245	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	20	13	16	17		20	17	14	15	
Manganese	ug/L	186	107	216	193		254	405	206	163	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	<0.10	1.05	<0.10	<0.10		<0.10	0.12	<0.10	0.11	
Nitrite	mg/L	<0.020	0.051	<0.020	<0.020		<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	6	6	6	7		7	6	6	7	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	18	11	13	18		14	7	13	20	
Strontium	ug/L	208	120	178	206		203	185	146	208	
TKN	mg/L	1.55	0.58	0.49	0.89		1.57	0.43	0.38	0.81	
Total Dissolved Solids	mg/L	272	224	244	266		268	224	224	266	
Total Phosphorus	mg/L	0.021	0.043	0.024	0.077		0.022	0.048	0.024	0.035	
Total Suspended Solids	mg/L	11	18	<5	38		7	22	6	13	
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	25.22	22.99	27.59	19.04		26.64	23.66	27.72	17.65	
Conductivity	µmhos/cm	479.9	388.2	426.7	435.6		473.9	402.4	404.1	458.9	
D.O. Saturation	%	92.5	84.9	55.7	73.8		90.8	99.9	60.7	51.7	
Dissolved Oxygen	mg/L	7.6	7.28	4.39	6.83		7.27	8.46	4.77	4.92	
pH	S.U.	8.1	8.19	7.91	8.3		8.03	8.17	7.92	7.98	

Appendix Table 1. Continued.

		Site Location: **W FK OHIO BRUSH CK @ SR 32 NE OF SEAMAN** River Mile: 6.1 Storet: X04S26					Site Location: **W. FK. Ohio Brush CR. W OF Lawshe, Dst Georges CR.** River Mile: 1.1 Storet: X99Q08				
								Dup. A	Dup. B		Dup. A/B
Parameter	Units	6/25/2007 4:04 PM	7/30/2007 11:39 AM	8/8/2007 12:15 PM	9/12/2007 1:31 PM		6/25/2007 4:55 PM	7/30/2007 12:37 PM	7/30/2007 12:37 PM	8/8/2007 1:50 PM	9/12/2007 2:11 PM
Aluminum	ug/L	<200	<200	348	<200		423	<200	<200	212	384/384
Ammonia	mg/L	<0.050	<0.050	<0.050	0.1		<0.050	<0.050	<0.050	<0.050	0.202/0.212
Arsenic	ug/L	3.5	2.5	3.4	4		2.2	<2.0	<2.0	2.4	3/3.0
BOD5	mg/L	2.6	NA	NA	<2.0		3.2	NA	NA	NA	3.6/3.2
Barium	ug/L	72	60	66	72		92	63	63	79	172/174
CBOD5	mg/L	<2.0	2.4	2.4	<2.0		2	<2.0	<2.0	<2.0	2.8/2.5
COD	mg/L	20	19	18	19		32	<10	<10	11	19/16
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	<0.20/<0.20
Calcium	mg/L	47	49	42	39		48	66	66	45	46/47
Chloride	mg/L	53	27.9	31.6	60.5		26	33.3	33.3	44.2	67.8/68.9
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	<30/<30
Conductivity	µmhos/cm	536	440	382	523		429	534	532	465	457/457
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	<10/<10
Hardness, Total	mg/L	200	188	175	172		194	243	239	182	193/196
Iron	ug/L	332	265	444	287		835	363	363	393	867/894
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	<2.0/<2.0
Magnesium	mg/L	20	16	17	18		18	19	18	17	19/19
Manganese	ug/L	223	178	221	199		155	132	131	237	292/296
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	<0.20/<0.20
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	<40/<40
Nitrate+nitrite	mg/L	<0.10	<0.10	<0.10	<0.10		<0.10	0.17	0.12	<0.10	0.17/0.16
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020		<0.020	<0.020	<0.020	<0.020	0.048/0.048
Potassium	mg/L	7	5	6	7		4	5	5	6	7/7.0
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	<2.0/<2.0
Sodium	mg/L	29	15	19	36		12	15	15	27	31/32
Strontium	ug/L	165	147	152	165		142	157	158	144	252/256
TKN	mg/L	0.51	0.48	0.7	0.91		0.42	0.39	0.36	0.49	1.05/1.04
Total Dissolved Solids	mg/L	296	250	238	290		238	324	326	280	320/322
Total Phosphorus	mg/L	0.032	0.07	0.053	0.051		0.027	0.011	0.013	0.017	0.031/0.028
Total Suspended Solids	mg/L	8	9	12	<5		33	11	11	6	22/22
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	<10/<10
Field Measurements											
Temperature	°C	28.43	27.28	30.94	23.67		33.01	27.84	27.84	32.95	27.39
Conductivity	µmhos/cm	519.1	449.9	437.2	530.6		437.4	549.3	549.3	492.7	570.4
D.O. Saturation	%	85.1	108.1	96.1	67.5		133.6	123.6	123.6	97.7	105.6
Dissolved Oxygen	mg/L	6.61	8.56	7.14	5.71		9.58	9.69	9.69	7.02	8.34
pH	S.U.	8.01	8.34	8.26	8.19		8.22	8.1	8.1	8.07	8.06

Appendix Table 1. Continued.

		Site Location: **W FK OHIO BRUSH CK @ PETERSON RD** River Mile: 0.37 Storet: X04S25									
Parameter	Units	12/19/2006 10:30 AM	1/23/2007 10:49 AM	2/26/2007 12:04 PM	3/21/2007 11:19 AM	4/9/2007 10:27 AM	5/29/2007 11:21 AM	Dup A/B 6/25/2007 5:16 PM	7/30/2007 12:19 PM	Dup A/B 8/8/2007 1:22 PM	9/12/2007 2:26 PM
Aluminum	ug/L	<200	229	1240	<200	<200	<200	<200/<200	<200	<200/233	<200
Ammonia	mg/L	<0.050	0.111	0.11	<0.050	<0.050	<0.050	<0.050/<0.05	<0.050	<0.050/<0.05	0.067
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.5/2.4	<2.0	2.2/2.2	2.8
BOD5	mg/L	<2.0	<2.0	2	<2.0	NA	NA	2.5/2.5	NA	NA	2.4
Barium	ug/L	42	35	30	34	33	63	70/69	73	71/69	91
CBOD5	mg/L	NA	NA	NA	NA	NA	NA	<2.0/<2.0	<2.0	<2.0/<2.0	<2.0
COD	mg/L	<10	15	11	148	<10	20	19/16	15	15/15	13
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20/<0.20	<0.20
Calcium	mg/L	69	70	40	61	66	59	55/55	54	48/48	47
Chloride	mg/L	21.1	16.6	14.8	18.4	12.8	22.1	28.1/28.1	38.7	47.3/47.3	51.7
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30/<30	<30	<30/<30	<30
Conductivity	µmhos/cm	487	475	268	362	356	479	469/472	488	490/492	515
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10/<10	<10	<10/<10	<10
Hardness, Total	mg/L	259	253	141	230	239	230	220/220	205	190/190	191
Iron	ug/L	111	378	1700	159	106	372	198/226	266	260/250	457
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0/<2.0	<2.0
Magnesium	mg/L	21	19	10	19	18	20	20/20	17	17/17	18
Manganese	ug/L	17	17	46	18	21	180	126/131	116	120/118	258
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20/<0.20	<0.20
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40/<40	<40	<40/<40	<40
Nitrate+nitrite	mg/L	0.16	1.45	1.26	0.26	0.49	<0.10	<0.10/<0.10	<0.10	<0.10/<0.10	<0.10
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020/<0.02	<0.020	<0.020/<0.02	<0.020
Potassium	mg/L	4	3	3	3	2	3	4/4.0	5	6/6.0	7
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0/<2.0	<2.0
Sodium	mg/L	10	9	6	10	7	12	14/14	19	29/29	29
Strontium	ug/L	157	146	72	117	117	153	157/157	145	151/149	154
TKN	mg/L	<0.20	0.46	0.77	0.39	0.37	0.22	0.25/0.28	0.42	0.45/0.42	0.62
Total Dissolved Solids	mg/L	302	260	162	272	274	270	262/270	280	286/290	292
Total Phosphorus	mg/L	0.025	0.062	0.085	0.018	0.013	0.016	0.016/0.014	0.017	0.022/0.016	0.029
Total Suspended Solids	mg/L	<5	6	30	<5	<5	7	7/6.0	6	7/6.0	10
Zinc	ug/L	<10	<10	<10	<10	<10	<10	<10/<10	<10	<10/<10	<10
Field Measurements											
Temperature	°C	NA	2.08	4.28	9.91	5.52	25.24	28.72	26.73	30.74	24.82
Conductivity	µmhos/cm	NA	495.7	294.7	408.9	474	432.9	476.9	500.7	513.5	524.3
D.O. Saturation	%	NA	126	104.7	112.6	107.2	92.2	98.9	94.5	96	68.4
Dissolved Oxygen	mg/L	NA	17.36	13.61	12.73	13.49	7.57	7.63	7.55	7.16	5.66
pH	S.U.	NA	8.27	8.18	8.48	8.28	7.9	8.16	8.12	8.16	8.22

Appendix Table 1. Continued.

		Site Location: **Trib to W FK Ohio Brush CK (7.38) Upst Seaman WWTP** River Mile: 0.8 Storet: X04S09					Site Location: **GEORGES CREEK N OF TRANQUILITY, ADJ. SR 770** River Mile: 3.2 Storet: 200708				
Parameter	Units	7/30/2007 11:26 AM	8/8/2007 12:03 PM	9/12/2007 1:14 PM			6/25/2007 4:19 PM	7/30/2007 11:53 AM	8/8/2007 12:28 PM	9/12/2007 1:43 PM	
Aluminum	ug/L	377	548	446			486	2410	296	468	
Ammonia	mg/L	<0.050	0.11	<0.050			<0.050	0.116	<0.050	0.316	
Arsenic	ug/L	2	2.2	2.1			3.2	2.4	2.9	2	
BOD5	mg/L	NA	NA	<2.0			23	NA	NA	2.6	
Barium	ug/L	47	55	61			121	78	79	137	
CBOD5	mg/L	2.4	<2.0	<2.0			22	5	<2.0	<2.0	
COD	mg/L	15	11	13			34	25	31	19	
Cadmium	ug/L	<0.20	<0.20	<0.20			<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	59	67	77			61	52	49	46	
Chloride	mg/L	45	71.8	96.3			38.9	24.2	25.7	29.2	
Chromium	ug/L	<30	<30	<30			<30	<30	<30	<30	
Conductivity	µmhos/cm	527	650	783			548	424	425	436	
Copper	ug/L	<10	<10	<10			<10	<10	<10	<10	
Hardness, Total	mg/L	217	250	283			255	187	192	189	
Iron	ug/L	795	646	794			937	2810	532	794	
Lead	ug/L	<2.0	<2.0	<2.0			<2.0	2.5	<2.0	<2.0	
Magnesium	mg/L	17	20	22			25	14	17	18	
Manganese	ug/L	76	47	56			610	330	901	740	
Mercury	ug/L	<0.20	<0.20	<0.20			<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40			<40	<40	<40	<40	
Nitrate+nitrite	mg/L	1.24	0.52	1.42			0.17	1.73	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020			<0.020	0.079	<0.020	0.024	
Potassium	mg/L	5	6	7			6	13	11	9	
Selenium	ug/L	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	23	41	48			15	8	9	13	
Strontium	ug/L	115	143	158			167	106	129	178	
TKN	mg/L	0.37	0.75	0.65			1.16	1	0.71	0.9	
Total Dissolved Solids	mg/L	306	394	472			322	302	260	246	
Total Phosphorus	mg/L	0.144	0.356	0.457			0.055	0.146	0.035	0.04	
Total Suspended Solids	mg/L	28	22	26			42	64	15	22	
Zinc	ug/L	<10	<10	<10			<10	11	<10	<10	
Field Measurements											
Temperature	°C	23.68	28.82	21.19			27.92	25.06	30.33	23.52	
Conductivity	µmhos/cm	535.9	696.4	823.5			556.3	429.8	444.5	445.7	
D.O. Saturation	%	99.5	97.6	94.9			135.6	85.4	96.4	79.9	
Dissolved Oxygen	mg/L	8.41	7.52	8.41			10.61	7.04	7.24	6.78	
pH	S.U.	7.92	7.84	8.23			8.42	8.14	8.42	8	

Appendix Table 1. Continued.

		Site Location: **GEORGES CK @ MOUTH** River Mile: 0.10 Storet: X04P05									
Parameter	Units	Dup A 6/25/2007 4:38 PM	Dup B 6/25/2007 4:38 PM	Dup A 7/30/2007 12:51 PM	Dup B 7/30/2007 12:51 PM			Dup A 8/8/2007 1:48 PM	Dup B 8/8/2007 1:48 PM	Dup A 9/12/2007 2:00 PM	Dup B 9/12/2007 2:00 PM	
Aluminum	ug/L	<200	<200	<200	<200			317	299	<200	<200	
Ammonia	mg/L	0.079	0.081	<0.050	<0.050			<0.050	<0.050	0.06	0.063	
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0			<2.0	<2.0	8.6	8.4	
BOD5	mg/L	<2.0	<2.0	NA	NA			NA	NA	6.7	6.8	
Barium	ug/L	63	63	57	58			81	80	137	134	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0			<2.0	<2.0	5.5	5.6	
COD	mg/L	19	16	<10	<10			11	11	43	37	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20			<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	76	77	70	71			74	72	67	66	
Chloride	mg/L	56.6	57.1	31.8	31.9			34.8	35	42.6	42.4	
Chromium	ug/L	<30	<30	<30	<30			<30	<30	<30	<30	
Conductivity	µmhos/cm	666	663	548	536			561	561	548	548	
Copper	ug/L	<10	<10	<10	<10			<10	<10	<10	<10	
Hardness, Total	mg/L	293	295	257	260			271	262	262	260	
Iron	ug/L	243	297	214	183			507	478	1150	1130	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	25	25	20	20			21	20	23	23	
Manganese	ug/L	714	686	77	71			928	915	3620	3560	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20			<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40			<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.11	<0.10	<0.10	<0.10			<0.10	<0.10	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020			<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	5	5	6	6			5	5	8	8	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	20	20	13	13			15	15	17	17	
Strontium	ug/L	177	180	178	178			167	164	159	156	
TKN	mg/L	0.44	0.37	0.27	0.25			0.25	0.31	1.41	1.25	
Total Dissolved Solids	mg/L	372	380	348	346			372	372	340	344	
Total Phosphorus	mg/L	0.014	0.017	0.011	0.016			0.017	0.015	0.075	0.066	
Total Suspended Solids	mg/L	10	9	<5	<5			5	6	8	8	
Zinc	ug/L	<10	<10	<10	<10			<10	<10	<10	<10	
Field Measurements												
Temperature	°C	30.24	30.24	27.12	27.12			30.43	30.43	21.73	21.73	
Conductivity	µmhos/cm	635	635	563.2	563.2			593.9	593.9	579	579	
D.O. Saturation	%	111.4	111.4	121.6	121.6			64.5	64.5	32	32	
Dissolved Oxygen	mg/L	8.37	8.37	9.66	9.66			4.83	4.83	2.81	2.81	
pH	S.U.	7.76	7.76	8.07	8.07			7.83	7.83	8.04	8.04	

Appendix Table 1. Continued.

		Site Location: **Cherry Fork @ St. Rt. 136** River Mile: 8.74 Storet: 300302					Site Location: **CHERRY FORK E OF Town OF Cherry Fork @ Paint Rd.** River Mile: 7.5 Storet: 200710				
Parameter	Units	6/25/2007 12:25 PM	7/30/2007 3:28 PM	8/8/2007 2:37 PM	9/12/2007 2:51 PM		6/25/2007 12:42 PM	7/30/2007 3:18 PM	8/8/2007 3:36 PM	9/12/2007 3:00 PM	
Aluminum	ug/L	<200	350	215	243		209	<200	875	1220	
Ammonia	mg/L	0.629	2.18	0.322	0.176		<0.050	<0.050	0.057	0.108	
Arsenic	ug/L	3.1	4	8.1	4.3		2	2.3	4.6	2.9	
BOD5	mg/L	<2.0	NA	NA	3.7		4.1	NA	NA	6	
Barium	ug/L	99	95	142	117		54	48	140	244	
CBOD5	mg/L	<2.0	3	<2.0	2.5		2.5	5.1	6.8	4.1	
COD	mg/L	29	19	27	31		36	19	24	49	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	83	86	85	62		41	33	40	43	
Chloride	mg/L	97.3	89.1	77.4	69.7		26.5	22.4	30	69.8	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	893	851	782	643		404	355	389	569	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	310	309	311	233		185	152	182	210	
Iron	ug/L	223	965	845	616		421	316	1980	2360	
Lead	ug/L	<2.0	3.6	3.2	2.6		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	25	23	24	19		20	17	20	25	
Manganese	ug/L	870	614	2830	1140		194	187	1370	562	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.27	0.95	<0.10	0.34		0.22	<0.10	<0.10	<0.10	
Nitrite	mg/L	0.046	0.092	<0.020	0.036		<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	6	7	11	8		6	6	8	10	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	56	58	48	44		10	9	12	30	
Strontium	ug/L	245	234	256	210		112	105	164	362	
TKN	mg/L	2.12	3.16	1.23	1.06		2.47	0.69	0.88	0.9	
Total Dissolved Solids	mg/L	506	486	474	396		226	216	242	336	
Total Phosphorus	mg/L	0.097	0.318	0.252	0.135		0.046	0.026	0.121	0.09	
Total Suspended Solids	mg/L	8	28	52	33		14	10	60	85	
Zinc	ug/L	<10	21	<10	15		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	21.73	24.48	28.14	17.49		26.97	33.72	34.99	30.94	
Conductivity	µmhos/cm	877.2	868.2	977	681.2		377.4	363.1	403.9	601.7	
D.O. Saturation	%	60.8	92.8	26.8	36.6		98.3	160.4	183.6	146.3	
Dissolved Oxygen	mg/L	5.33	7.72	2.09	3.49		7.83	11.38	12.75	10.87	
pH	S.U.	7.63	7.88	7.85	8.17		8.21	8.7	8.88	8.44	

Appendix Table 1. Continued.

		Site Location: **CHERRY FK @ GRACES RUN RD AT HARSHAVILLE** River Mile: 2.61 Storet: X04P07					Site Location: **GRACE RUN S OF SEAMAN @ ST. RT. 247** River Mile: 1.4 Storet: 200709				
Parameter	Units	6/25/2007 1:19 PM	7/30/2007 2:22 PM	8/8/2007 3:09 PM	9/12/2007 3:26 PM		6/25/2007 1:01 PM	7/30/2007 2:09 PM	8/8/2007 3:22 PM	9/12/2007 3:15 PM	
Aluminum	ug/L	317	<200	253	211		<200	416	340	<200	
Ammonia	mg/L	0.077	0.062	0.124	1.07		0.078	0.286	<0.050	1.4	
Arsenic	ug/L	2.7	3.3	4.2	3.3		2.3	4.2	7.3	10.8	
BOD5	mg/L	<2.0	NA	NA	3.6		4.7	NA	NA	3.9	
Barium	ug/L	60	72	84	130		102	70	101	154	
CBOD5	mg/L	<2.0	<2.0	4.3	2.7		2.8	3.1	5.4	3.2	
COD	mg/L	40	25	34	19		33	22	40	40	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	51	44	39	59		68	53	50	58	
Chloride	mg/L	36.8	32.4	39.1	40.7		49	33.9	48.6	45.4	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	548	488	499	639		630	488	505	567	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	226	196	180	230		264	206	203	235	
Iron	ug/L	726	656	539	780		386	870	765	1480	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	24	21	20	20		23	18	19	22	
Manganese	ug/L	156	224	542	1240		511	1190	3060	3970	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.15	<0.10	<0.10	<0.10		0.16	7.13	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	0.025		<0.020	0.028	<0.020	<0.020	
Potassium	mg/L	9	8	8	18		9	10	10	19	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	21	22	28	37		22	17	24	20	
Strontium	ug/L	427	365	294	1430		181	125	134	183	
TKN	mg/L	1.47	0.75	1.13	1.98		3.26	1.34	1.33	3.17	
Total Dissolved Solids	mg/L	316	292	298	408		350	286	306	350	
Total Phosphorus	mg/L	0.037	0.036	0.035	0.074		0.046	0.097	0.11	0.155	
Total Suspended Solids	mg/L	21	13	14	14		16	18	14	5	
Zinc	ug/L	<10	<10	<10	13		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	24.1	35.02	34.19	16.81		23.66	25.75	29.96	20.35	
Conductivity	µmhos/cm	538.1	506.2	531	674.2		616.4	496.9	527.5	598	
D.O. Saturation	%	89.4	152.9	115	40.5		85.8	109.4	157.5	35.4	
Dissolved Oxygen	mg/L	7.5	10.61	8.09	3.92		7.26	8.91	11.9	3.19	
pH	S.U.	7.92	8.44	8.29	7.96		7.87	8.19	8.77	7.95	

Appendix Table 1. Continued.

		Site Location: **Buck Run @ Armstrong Rd.** River Mile: 0.38 Storet: 300303					Site Location: **Little West Fork @ Forsythe Rd.** River Mile: 6.26 Storet: 300304				
Parameter	Units	6/25/2007 3:03 PM	7/30/2007 11:06 AM	8/8/2007 11:38 AM	9/12/2007 12:20 PM		6/25/2007 10:14 AM	7/30/2007 10:07 AM	8/8/2007 10:21 AM		
Aluminum	ug/L	<200	870	356	690		<200	<200	<200		
Ammonia	mg/L	0.108	0.178	0.12	0.298		<0.050	<0.050	1.37		
Arsenic	ug/L	2.4	<2.0	2	4		2.1	<2.0	2.3		
BOD5	mg/L	2.1	NA	NA	3.8		<2.0	NA	NA		
Barium	ug/L	74	72	77	87		68	72	90		
CBOD5	mg/L	<2.0	<2.0	2.2	3.1		<2.0	<2.0	2.3		
COD	mg/L	22	12	18	31		37	12	18		
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20		
Calcium	mg/L	58	62	61	49		54	50	58		
Chloride	mg/L	23.9	31.5	33.6	23.3		19.5	21	24.2		
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30		
Conductivity	µmhos/cm	503	536	526	318		475	446	508		
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10		
Hardness, Total	mg/L	235	233	235	180		234	211	248		
Iron	ug/L	341	1190	488	1220		170	176	208		
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
Magnesium	mg/L	22	19	20	14		24	21	25		
Manganese	ug/L	316	240	972	2540		139	240	145		
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20		
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40		
Nitrate+nitrite	mg/L	0.11	0.56	0.11	<0.10		0.25	0.23	0.42		
Nitrite	mg/L	<0.020	0.026	<0.020	0.024		0.057	<0.020	0.109		
Potassium	mg/L	4	5	5	6		7	8	12		
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0		
Sodium	mg/L	13	17	18	13		7	7	8		
Strontium	ug/L	159	170	167	135		126	122	151		
TKN	mg/L	0.59	0.95	0.79	1		1.2	0.54	2.47		
Total Dissolved Solids	mg/L	288	336	332	244		274	254	302		
Total Phosphorus	mg/L	0.027	0.046	0.036	0.081		0.035	0.032	0.053		
Total Suspended Solids	mg/L	5	28	12	34		8	22	11		
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10		
Field Measurements											
Temperature	°C	24.04	22.37	25.89	18.33		21.78	22.8	26.04		
Conductivity	µmhos/cm	500.9	545.3	551.7	418.3		474.4	452.5	538.4		
D.O. Saturation	%	68.2	64.1	74.6	35.1		97.2	99.4	60.2		
Dissolved Oxygen	mg/L	5.73	5.56	6.05	3.3		8.53	8.55	4.88		
pH	S.U.	7.79	7.92	8.13	8.09		8.11	8.04	7.95		

Appendix Table 1. Continued.

		Site Location: **L. West Fork S of Sugar Tree Ridge @ Shaw-Baker Rd** River Mile: 5.7 Storet: 200715					Site Location: **LITTLE WEST FORK NW OF SEAMAN @ MOUTH** River Mile: 0.1 Storet: 200713				
Parameter	Units	6/25/2007 10:51 AM	7/30/2007 10:20 AM	8/8/2007 10:34 AM	9/12/2007 11:51 AM		6/25/2007 2:50 PM	7/30/2007 10:57 AM	8/8/2007 11:24 AM	9/12/2007 12:05 PM	
Aluminum	ug/L	<200	<200	<200	<200		337	341	<200	<200	
Ammonia	mg/L	0.1	0.06	0.135	0.678		<0.050	<0.050	<0.050	<0.050	
Arsenic	ug/L	<2.0	<2.0	<2.0	3		2.3	<2.0	2.2	2.4	
BOD5	mg/L	<2.0	NA	NA	3.6		7.7	NA	NA	5.6	
Barium	ug/L	76	50	69	131		81	59	70	72	
CBOD5	mg/L	<2.0	<2.0	<2.0	2.3		4.4	<2.0	3.4	4.2	
COD	mg/L	19	12	15	25		28	12	18	22	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	61	50	53	59		54	46	45	44	
Chloride	mg/L	27	24.8	27	23		25.3	21.9	22.4	28	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	499	434	457	404		466	380	385	311	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	247	203	210	234		217	164	166	172	
Iron	ug/L	238	106	255	395		826	491	375	406	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	23	19	19	21		20	12	13	15	
Manganese	ug/L	321	152	372	2320		351	79	355	278	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.16	0.12	0.22	<0.10		<0.10	0.54	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	0.03		<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	4	6	5	7		7	5	6	6	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	11	9	10	9		11	11	11	13	
Strontium	ug/L	157	126	146	184		177	116	140	160	
TKN	mg/L	0.5	1.47	0.53	1.37		0.55	0.41	0.63	0.81	
Total Dissolved Solids	mg/L	268	256	260	346		266	222	230	242	
Total Phosphorus	mg/L	0.021	0.021	0.021	0.039		0.055	0.02	0.04	0.042	
Total Suspended Solids	mg/L	6	<5	5	15		82	8	12	15	
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Field Measurements											
Temperature	°C	20.53	22.23	24.91	17.05		27.99	23.79	27.61	21.27	
Conductivity	µmhos/cm	491.8	440.1	476.8	509.1		464.6	383.3	400.9	401.9	
D.O. Saturation	%	61.5	66.1	43.3	41.3		100.6	88.3	71	74.7	
Dissolved Oxygen	mg/L	5.52	5.75	3.58	3.98		7.87	7.46	5.59	6.62	
pH	S.U.	7.76	8.05	7.99	8.05		8.25	8	8.12	8.14	

Appendix Table 1. Continued.

		Site Location: **ELK FK @ SR 32 DST WINCHESTER WWTP** River Mile: 1.61 Storet: X04S02					Site Location: **FLAT RUN SE OF BELFAST, DST. ST. RT. 770** River Mile: 1.1 Storet: 200732				
Parameter	Units	6/25/2007 1:57 PM	7/30/2007 3:49 PM	8/8/2007 2:19 PM	9/12/2007 10:08 AM		6/25/2007 1:48 PM				
Aluminum	ug/L	<200	209	<200	360		<200				
Ammonia	mg/L	<0.050	0.075	0.4	0.261		<0.050				
Arsenic	ug/L	2.5	2.4	3.1	2.8		7.7				
BOD5	mg/L	3.2	NA	NA	4.5		9.6				
Barium	ug/L	70	69	68	89		76				
CBOD5	mg/L	<2.0	2.2	2.9	2.9		7.1				
COD	mg/L	25	22	21	25		61				
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20				
Calcium	mg/L	56	53	44	50		63				
Chloride	mg/L	38.3	33	37.9	37		34.4				
Chromium	ug/L	<30	<30	<30	<30		<30				
Conductivity	µmhos/cm	519	453	449	394		632				
Copper	ug/L	<10	<10	<10	<10		<10				
Hardness, Total	mg/L	222	186	168	178		289				
Iron	ug/L	224	447	226	633		302				
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0				
Magnesium	mg/L	20	13	14	13		32				
Manganese	ug/L	113	119	79	479		337				
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20				
Nickel	ug/L	<40	<40	<40	<40		<40				
Nitrate+nitrite	mg/L	<0.10	0.6	0.4	0.35		<0.10				
Nitrite	mg/L	<0.020	0.043	0.074	0.057		<0.020				
Potassium	mg/L	6	7	11	13		32				
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0				
Sodium	mg/L	18	20	22	19		8				
Strontium	ug/L	171	117	130	151		247				
TKN	mg/L	0.64	0.84	1.31	1.07		1.42				
Total Dissolved Solids	mg/L	282	294	272	270		416				
Total Phosphorus	mg/L	0.03	0.066	0.055	0.083		0.083				
Total Suspended Solids	mg/L	8	7	7	19		12				
Zinc	ug/L	<10	<10	<10	<10		<10				
Field Measurements											
Temperature	°C	27.1	27.98	32.72	21.84		30.61				
Conductivity	µmhos/cm	504.8	480.9	469.2	469.5		645.4				
D.O. Saturation	%	88.9	108.1	133.7	43.9		122.7				
Dissolved Oxygen	mg/L	7.06	8.46	9.64	3.84		9.16				
pH	S.U.	8.2	8.2	8.67	7.89		8.19				

Appendix Table 1. Continued.

		Site Location: **Elm Run @ Deadfall Rd.** River Mile: 1.75 Storet: 300305					Site Location: **ELK RUN Ust. Elm Run** River Mile: 1.33 Storet: 300306				
Parameter	Units	Dup A 6/25/2007 11:43 AM	Dup B 6/25/2007 11:43 AM	7/30/2007 11:53 AM	Dup A/B 8/8/2007 10:59 AM	9/12/2007 11:37 AM	6/25/2007 1:13 PM	7/30/2007 11:36 AM	8/8/2007 10:44 AM	9/12/2007 11:23 AM	
Aluminum	ug/L	<200	<200	270	221/223	<200	<200	<200	210	<200	
Ammonia	mg/L	0.089	0.083	<0.050	0.141/0.142	0.085	<0.050	<0.050	0.059	0.099	
Arsenic	ug/L	<2.0	<2.0	<2.0	2/<2.0	3.2	<2.0	<2.0	<2.0	2.4	
BOD5	mg/L	<2.0	<2.0	NA	NA	6.2	<2.0	NA	NA	4.5	
Barium	ug/L	46	46	47	56/56	63	43	50	62	54	
CBOD5	mg/L	<2.0	<2.0	3.5	3.5/4.1	4.4	<2.0	<2.0	2.2	3.4	
COD	mg/L	21	20	19	15/15	37	15	<10	<10	16	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	54	52	43	42/42	38	64	69	72	61	
Chloride	mg/L	7.6	7.8	6.4	6.8/6.9	10.1	<5.0	6.8	10.8	27.6	
Chromium	ug/L	<30	<30	<30	<30/<30	<30	<30	<30	<30	<30	
Conductivity	µmhos/cm	462	458	387	362/365	308	478	503	496	379	
Copper	ug/L	<10	<10	<10	<10/<10	<10	<10	<10	<10	<10	
Hardness, Total	mg/L	258	253	214	216/216	198	271	283	291	255	
Iron	ug/L	337	290	470	440/441	374	214	292	479	192	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	30	30	26	27/27	25	27	27	27	25	
Manganese	ug/L	98	93	172	529/520	1410	81	265	660	463	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40/<40	<40	<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.22	0.22	<0.10	0.13/0.13	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020/<0.02	<0.020	<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	3	3	3	4/4.0	7	2	2	3	3	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	<5	<5	<5	<5/<5	5	<5	5	8	15	
Strontium	ug/L	71	69	62	65/65	64	72	77	88	91	
TKN	mg/L	<0.20	<0.20	0.68	0.48/0.43	0.97	<0.20	<0.20	<0.20	0.45	
Total Dissolved Solids	mg/L	264	266	226	232/232	244	270	278	262	304	
Total Phosphorus	mg/L	0.011	0.015	0.028	0.022/0.025	0.045	<0.010	<0.010	0.017	0.027	
Total Suspended Solids	mg/L	8	8	25	13/15	7	<5	13	22	10	
Zinc	ug/L	10	<10	<10	<10/<10	<10	<10	<10	<10	<10	
Field Measurements											
Temperature	°C	20.47	20.47	NA	27.13	20.09	21.78	24.21	26.83	17.48	
Conductivity	µmhos/cm	462.4	462.4	NA	388.1	363.1	482.2	472.6	502.7	481.9	
D.O. Saturation	%	63.3	63.3	NA	44.5	65.3	91.8	63.9	67.5	66.6	
Dissolved Oxygen	mg/L	5.69	5.69	NA	3.54	5.93	8.05	5.35	5.39	6.36	
pH	S.U.	7.87	7.87	NA	8.1	7.91	8	7.8	7.88	7.86	

Appendix Table 1. Continued.

		Site Location: **ELK RUN NE OF BELFAST @ COSS RD.** River Mile: 0.9 Storet: 200733					Site Location: **LOST FORK S OF FOLSOM @ ST. RT. 247** River Mile: 2.5 Storet: 200739				
Parameter	Units	6/25/2007 1:01 PM	7/30/2007 1:59 PM	8/8/2007 12:00 PM	9/12/2007 12:32 PM		6/25/2007 12:23 PM	7/30/2007 12:19 PM	8/8/2007 11:29 AM	9/12/2007 12:01 PM	
Aluminum	ug/L	<200	415	884	5310		<200	243	339	374	
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050	<0.050	0.136	0.102	
Arsenic	ug/L	<2.0	2	3	3.9		2	<2.0	2.1	2.9	
BOD5	mg/L	<2.0	NA	NA	4		<2.0	NA	NA	9.2	
Barium	ug/L	51	47	59	70		43	65	74	113	
CBOD5	mg/L	<2.0	3.8	7.4	3.5		<2.0	3	<2.0	5.1	
COD	mg/L	13	15	31	79		21	25	18	40	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	52	37	34	36		43	44	46	53	
Chloride	mg/L	7.5	6.5	8.4	26.6		9.4	78.8	93.1	154	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	440	362	340	323		412	593	628	841	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	237	199	204	143		227	204	210	239	
Iron	ug/L	200	775	1560	8250		179	421	560	868	
Lead	ug/L	<2.0	<2.0	<2.0	3.6		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	26	26	29	13		29	23	23	26	
Manganese	ug/L	74	210	451	162		61	170	406	1020	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.14	<0.10	<0.10	0.24		0.1	<0.10	11.9	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	0.028		<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	3	4	4	4		4	5	6	12	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	<5	<5	5	17		5	41	47	79	
Strontium	ug/L	125	70	76	70		109	127	137	164	
TKN	mg/L	<0.20	0.5	0.59	0.55		<0.20	0.56	1.33	1.26	
Total Dissolved Solids	mg/L	238	216	220	288		240	350	384	518	
Total Phosphorus	mg/L	0.038	0.011	0.059	0.071		0.02	0.024	0.026	0.069	
Total Suspended Solids	mg/L	<5	43	68	156		<5	42	23	53	
Zinc	ug/L	<10	<10	<10	22		<10	11	<10	10	
Field Measurements											
Temperature	°C	24.47	29.34	30.01	19.9		23.26	27.01	28.29	19.99	
Conductivity	µmhos/cm	443.9	342.7	366.3	333.9		679.3	554.5	628	819.9	
D.O. Saturation	%	98.7	118.7	116	92.7		103.8	93.7	67.3	70	
Dissolved Oxygen	mg/L	8.23	9.07	8.76	8.44		8.85	7.46	5.23	6.35	
pH	S.U.	8.01	8.62	8.54	8.58		8.41	8.35	8.1	8.05	

Appendix Table 1. Continued.

		Site Location: **LOST FORK S OF FOLSOM @ Peach Orchard Rd.** River Mile: 1.7 Storet: 200738					Site Location: **BAKER FORK S OF CYNTHIANA @ DRY BONE RD.** River Mile: 14.8 Storet: 200730				
Parameter	Units	Dup A 6/25/2007 12:33 PM	Dup B 6/25/2007 12:33 PM	7/30/2007 12:36 PM	8/8/2007 11:36 AM	9/12/2007 12:11 PM	6/25/2007 9:52 AM	7/30/2007 9:41 AM	8/8/2007 9:28 AM	9/12/2007 9:39 AM	
Aluminum	ug/L	233	278	209	202	296	234	<200	294	345	
Ammonia	mg/L	<0.050	<0.050	<0.050	0.072	0.06	0.064	0.058	0.178	0.164	
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.5	2.5	3	3.3	
BOD5	mg/L	<2.0	<2.0	NA	NA	<2.0	<2.0	NA	NA	<2.0	
Barium	ug/L	66	69	59	58	57	66	63	69	63	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
COD	mg/L	20	24	<10	<10	10	23	<10	11	22	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	59	61	52	49	43	72	68	66	53	
Chloride	mg/L	16.9	16.9	18.2	18.1	16.2	15.8	13.9	15.2	14.2	
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30	<30	
Conductivity	µmhos/cm	468	471	445	423	306	555	537	534	445	
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Hardness, Total	mg/L	246	255	224	213	190	295	281	280	215	
Iron	ug/L	331	364	327	295	487	355	315	400	591	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.9	<2.0	
Magnesium	mg/L	24	25	23	22	20	28	27	28	20	
Manganese	ug/L	88	91	81	122	92	101	88	116	92	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40	<40	
Nitrate+nitrite	mg/L	<0.10	<0.10	0.26	<0.10	<0.10	0.61	0.27	0.54	0.52	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.022	<0.020	0.076	0.055	
Potassium	mg/L	3	3	3	3	4	3	3	6	8	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	6	7	8	8	8	9	9	9	8	
Strontium	ug/L	99	102	94	91	83	121	114	117	87	
TKN	mg/L	<0.20	<0.20	0.31	<0.20	0.36	0.24	0.52	0.85	0.73	
Total Dissolved Solids	mg/L	268	272	248	248	238	328	312	312	284	
Total Phosphorus	mg/L	0.01	0.013	<0.010	0.013	0.034	0.151	0.073	0.072	0.225	
Total Suspended Solids	mg/L	7	7	12	9	19	8	8	7	17	
Zinc	ug/L	<10	<10	14	<10	<10	<10	<10	<10	<10	
Field Measurements											
Temperature	°C	20.81	20.81	23.64	26.28	18.14	19.82	22.24	25.99	16.84	
Conductivity	µmhos/cm	471.4	471.4	414.2	418.7	362	558.5	500.9	534.6	406	
D.O. Saturation	%	76.7	76.7	76.6	56.9	57.1	70.7	52.2	52.9	52.7	
Dissolved Oxygen	mg/L	6.86	6.86	6.48	4.59	5.38	6.44	4.54	4.29	5.1	
pH	S.U.	7.93	7.93	8.06	7.98	7.93	7.95	7.88	8.19	7.92	

Appendix Table 1. Continued.

		Site Location: **BAKER FORK AT FORT HILL RD.** River Mile: 10.5 Storet: 200729					Site Location: **M. FK. BAKER FORK @ SINKING SPRING RD.** River Mile: 5.4 Storet: 200727				
Parameter	Units	6/25/2007 10:06 AM	Dup A 7/30/2007 10:06 AM	Dup B 7/30/2007 10:06 AM	8/8/2007 9:41 AM	9/12/2007 10:12 AM	6/25/2007 11:17 AM	7/30/2007 11:22 AM	8/8/2007 10:38 AM	9/12/2007 11:08 AM	
Aluminum	ug/L	360	285	290	256	233	<200	<200	<200	<200	
Ammonia	mg/L	<0.050	<0.050	<0.050	0.068	<0.050	<0.050	<0.050	<0.050	<0.050	
Arsenic	ug/L	2.3	2.5	2.5	2.7	3.4	<2.0	<2.0	<2.0	<2.0	
BOD5	mg/L	<2.0	NA	NA	NA	<2.0	<2.0	NA	NA	<2.0	
Barium	ug/L	68	70	70	71	71	26	47	51	53	
CBOD5	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
COD	mg/L	<10	15	12	<10	16	17	<10	<10	<10	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	59	61	60	62	55	30	74	81	78	
Chloride	mg/L	12.2	13.1	13.4	13.8	12.7	7.9	9	8.6	10.4	
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30	<30	
Conductivity	µmhos/cm	485	502	505	503	346	533	583	577	582	
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Hardness, Total	mg/L	250	259	257	266	240	141	321	346	343	
Iron	ug/L	487	445	475	338	444	91	164	171	252	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	25	26	26	27	25	16	33	35	36	
Manganese	ug/L	136	133	135	180	116	25	97	169	132	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.28	0.11	0.13	0.11	<0.10	0.15	<0.10	<0.10	<0.10	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Potassium	mg/L	3	4	3	4	5	<2	2	<2	2	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	8	9	9	10	8	5	5	5	5	
Strontium	ug/L	123	123	121	128	112	30	69	75	74	
TKN	mg/L	0.42	0.39	0.48	0.35	0.4	<0.20	0.24	<0.20	<0.20	
Total Dissolved Solids	mg/L	286	294	296	306	284	304	324	328	348	
Total Phosphorus	mg/L	0.051	0.049	0.042	0.063	0.081	<0.010	<0.010	0.014	0.011	
Total Suspended Solids	mg/L	12	31	34	12	15	<5	<5	<5	9	
Zinc	ug/L	<10	<10	<10	<10	<10	39	14	<10	<10	
Field Measurements											
Temperature	°C	20.25	22.14	22.14	25.17	17.82	20.17	22.02	23.93	17.55	
Conductivity	µmhos/cm	485.7	469.1	469.1	504.7	433.4	535	538.1	581.6	555.8	
D.O. Saturation	%	77.7	54.3	54.3	59.1	70	94.5	89.8	69.6	60.2	
Dissolved Oxygen	mg/L	7.02	4.73	4.73	4.86	6.64	8.55	7.84	5.86	5.74	
pH	S.U.	8	7.91	7.91	8.06	8.34	8	7.71	7.84	7.91	

Appendix Table 1. Continued.

		Site Location: **BAKER FK @ HORNER CHAPEL RD** River Mile: 1.49 Storet: X04G02									
									Dup A/B		
		12/19/2006	1/23/2007	2/26/2007	3/21/2007	4/9/2007	5/29/2007	6/25/2007	7/30/2007	8/8/2007	9/12/2007
Parameter	Units	9:54 AM	10:05 AM	11:16 AM	10:41 AM	9:53 AM	10:24 AM	10:44 AM	10:44 AM	10:10 AM	10:43 AM
Aluminum	ug/L	<200	<200	1530	<200	<200	<200	401	346/379	367	1560
Ammonia	mg/L	<0.050	<0.050	0.082	<0.050	<0.050	<0.050	<0.050	<0.050/<0.05	<0.050	0.104
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	2.2
BOD5	mg/L	<2.0	<2.0	<2.0	<2.0	NA	NA	<2.0	NA	NA	<2.0
Barium	ug/L	59	49	51	53	52	78	83	84/84	89	97
CBOD5	mg/L	NA	NA	NA	NA	NA	NA	<2.0	<2.0/<2.0	<2.0	<2.0
COD	mg/L	<10	<10	<10	<10	<10	17	26	<10/12	<10	19
Cadmium	ug/L	<0.20	<0.20	0.21	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20
Calcium	mg/L	49	42	23	42	39	52	54	50/50	48	41
Chloride	mg/L	9.6	7.5	7.5	9.3	7.4	9.6	11.8	13.8/14	12	13.3
Chromium	ug/L	<30	<30	<30	<30	<30	<30	<30	<30/<30	<30	<30
Conductivity	µmhos/cm	421	324	197	312	286	467	430	449/449	430	412
Copper	ug/L	<10	<10	<10	<10	<10	<10	<10	<10/<10	<10	<10
Hardness, Total	mg/L	225	191	103	191	180	245	246	228/228	223	197
Iron	ug/L	165	231	2130	195	170	246	727	558/559	478	2070
Lead	ug/L	<2.0	<2.0	2	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	2.1
Magnesium	mg/L	25	21	11	21	20	28	27	25/25	25	23
Manganese	ug/L	19	20	93	20	25	66	89	76/76	90	173
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20/<0.20	<0.20	<0.20
Nickel	ug/L	<40	<40	<40	<40	<40	<40	<40	<40/<40	<40	<40
Nitrate+nitrite	mg/L	0.22	0.88	1.48	0.33	0.45	0.19	0.22	<0.10/<0.10	<0.10	0.1
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020/<0.02	<0.020	<0.020
Potassium	mg/L	2	2	3	2	2	3	3	4/4.0	4	5
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0	<2.0
Sodium	mg/L	7	5	<5	6	5	7	7	8/8.0	8	7
Strontium	ug/L	90	67	46	78	68	96	98	91/92	95	81
TKN	mg/L	0.31	0.2	0.56	0.34	<0.20	<0.20	0.54	0.37/0.29	0.27	0.49
Total Dissolved Solids	mg/L	254	204	130	226	208	268	240	262/260	256	250
Total Phosphorus	mg/L	0.015	0.025	0.097	0.029	0.559	<0.010	0.021	0.015/0.012	0.011	0.099
Total Suspended Solids	mg/L	<5	<5	61	5	<5	6	16	16/17	12	69
Zinc	ug/L	<10	<10	24	<10	11	<10	12	20/20	<10	13
Field Measurements											
Temperature	°C	NA	2.54	3.41	8.74	4.99	21.82	20.87	24.25	26.19	18.36
Conductivity	µmhos/cm	NA	374	210.2	342	362.2	420.3	427.3	420.9	425.6	370.6
D.O. Saturation	%	NA	116.1	114	105.6	113.9	85.2	77.3	67.5	63.6	72.1
Dissolved Oxygen	mg/L	NA	15.81	15.17	12.27	14.54	7.47	6.9	5.65	5.14	6.77
pH	S.U.	NA	8.31	8.28	8.25	7.94	7.98	8.02	7.97	8.07	7.92

Appendix Table 1. Continued.

		Site Location: **M. FK. BAKER FORK NEAR MOUTH @ STRAIT CREEK RD** River Mile: 0.2 Storet: 200725					Site Location: **STRAIT CREEK @ STRAIT CREEK RD.** River Mile: 0.6 Storet: X99O09				
Parameter	Units	6/25/2007 11:01 AM	7/30/2007 11:01 AM	8/8/2007 10:24 AM	9/12/2007 10:54 AM		6/25/2007 10:26 AM	7/30/2007 10:27 AM	8/8/2007 9:57 AM	9/12/2007 10:27 AM	
Aluminum	ug/L	290	260	565	<200		<200	<200	<200	384	
Ammonia	mg/L	<0.050	<0.050	0.102	0.094		<0.050	<0.050	0.078	0.301	
Arsenic	ug/L	<2.0	<2.0	<2.0	2.6		<2.0	<2.0	<2.0	<2.0	
BOD5	mg/L	<2.0	NA	NA	2.7		<2.0	NA	NA	4.1	
Barium	ug/L	57	66	82	87		81	89	106	90	
CBOD5	mg/L	<2.0	<2.0	2	<2.0		<2.0	<2.0	<2.0	2.5	
COD	mg/L	17	<10	<10	19		19	<10	<10	22	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	0.24	
Calcium	mg/L	60	57	58	49		54	56	60	45	
Chloride	mg/L	8.7	8.7	8.9	10.3		6.5	10.6	12.9	17	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	478	479	465	336		473	504	540	333	
Copper	ug/L	<10	<10	<10	<10		<10	<10	<10	<10	
Hardness, Total	mg/L	269	254	260	229		254	263	282	199	
Iron	ug/L	406	345	755	268		218	262	124	639	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	29	27	28	26		29	30	32	21	
Manganese	ug/L	68	138	377	791		32	47	201	355	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.14	<0.10	<0.10	0.11		0.1	<0.10	0.62	0.95	
Nitrite	mg/L	<0.020	<0.020	<0.020	0.032		<0.020	<0.020	<0.020	0.081	
Potassium	mg/L	3	3	3	6		3	3	4	6	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	<5	<5	5	5		5	6	8	9	
Strontium	ug/L	74	82	90	91		74	75	87	64	
TKN	mg/L	0.2	0.26	0.27	0.41		<0.20	<0.20	2.32	1	
Total Dissolved Solids	mg/L	274	278	278	272		282	286	330	288	
Total Phosphorus	mg/L	<0.010	0.014	0.027	0.025		<0.010	<0.010	0.01	0.048	
Total Suspended Solids	mg/L	18	10	21	8		<5	<5	<5	16	
Zinc	ug/L	<10	<10	<10	<10		<10	<10	<10	14	
Field Measurements											
Temperature	°C	21.64	25.02	25.7	18.1		19.87	21.88	24.58	17	
Conductivity	µmhos/cm	463.6	450.2	464.5	407.8		473.7	465.5	533.7	392.9	
D.O. Saturation	%	91.1	73.2	39.5	42.4		87.4	68.2	43.5	35.7	
Dissolved Oxygen	mg/L	8.02	6.04	3.22	4		7.96	5.97	3.62	3.45	
pH	S.U.	8.14	7.93	7.93	7.68		8.11	7.97	7.95	7.95	

Appendix Table 1. Continued.

		Site Location: **Muddy Fork @ Frost Road** River Mile: 0.39 Storet: 300309					Site Location: **WEST UNION WWTP OUTFALL TO BEASLEY FK** River Mile: 6.65 Storet: X04S13				
Parameter	Units	6/25/2007 9:24 AM	7/30/2007 9:18 AM	8/8/2007 9:11 AM	9/12/2007 9:55 AM		6/25/2007 1:04 PM	7/30/2007 11:46 AM	8/8/2007 11:47 AM	9/12/2007 1:09 PM	
Aluminum	ug/L	435	233	725	657		<200	<200	<200	<200	
Ammonia	mg/L	<0.050	<0.050	0.081	0.209		0.145	0.105	0.148	0.069	
Arsenic	ug/L	2.6	2.4	3	4.1		<2.0	<2.0	<2.0	<2.0	
BOD5	mg/L	<2.0	NA	NA	5.4		3.2	NA	NA	<2.0	
Barium	ug/L	61	56	76	75		21	28	22	17	
CBOD5	mg/L	<2.0	<2.0	<2.0	2.3		<2.0	4.7	<2.0	<2.0	
COD	mg/L	27	19	11	37		45	25	43	75	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	71	68	71	56		62	70	65	61	
Chloride	mg/L	16.3	15	21.4	20.2		106	83.6	90.3	103	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	534	536	545	358		901	832	815	851 B	
Copper	ug/L	<10	<10	<10	<10		28	42	15	23	
Hardness, Total	mg/L	284	277	288	226		258	286	265	247	
Iron	ug/L	638	366	1020	957		118	329	131	87	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	26	26	27	21		25	27	25	23	
Manganese	ug/L	87	72	151	107		21	30	<10	<10	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.94	0.5	0.53	2.22		17.4	8.62	14.1	29.1	
Nitrite	mg/L	0.02	<0.020	0.028	0.143		0.097	0.077	0.095	0.056	
Potassium	mg/L	4	3	5	12		15	11	11	17	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	10	9	10	10		81	58	61	81	
Strontium	ug/L	112	106	117	93		181	166	162	184	
TKN	mg/L	<0.20	0.38	0.6	1.27		2.03	1.39	1.88	1.37	
Total Dissolved Solids	mg/L	322	324	322	310		580	512	534	582	
Total Phosphorus	mg/L	0.246	0.117	0.131	0.491		5.19	3.03	3.42	5.93	
Total Suspended Solids	mg/L	14	8	50	170		6	59	<5	<5	
Zinc	ug/L	10	<10	27	<10		47	43	42	52	
Field Measurements											
Temperature	°C	19.54	21.07	24.67	16.75		23.67	24.43	27.21	22.1	
Conductivity	µmhos/cm	536.1	504.6	544	438.9		924.2	717.1	732	827.7	
D.O. Saturation	%	71.9	66.6	59.7	64.3		85.8	91.6	87.2	92.1	
Dissolved Oxygen	mg/L	6.59	5.92	4.96	6.24		7.25	7.64	6.91	8.02	
pH	S.U.	8.01	8.02	7.98	8.21		7.86	8.06	8.06	8.22	

Appendix Table 1. Continued.

		Site Location: **PEEBLES WWTP OUTFALL TO SHIMER RUN** River Mile: 2.2 Storet: X04S06					Site Location: **SEAMAN WWTP OUTFALL TO TRIB TO W FK OHIO BRUSH CK (7.38)** River Mile: 0.75 Storet: X04S08				
Parameter	Units	6/25/2007 3:05 PM	7/30/2007 3:01 PM	8/8/2007 1:31 PM	9/12/2007 2:03 PM		6/25/2007 3:37 PM	7/30/2007 11:25 AM	8/8/2007 12:01 PM	9/12/2007 1:36 PM	
Aluminum	ug/L	<200	<200	<200	<200		<200	<200	<200	<200	
Ammonia	mg/L	0.568	0.403	0.166	0.879		<0.050	<0.050	5.51	<0.050	
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	2.5	<2.0	
BOD5	mg/L	2	NA	NA	2.5		2.5	NA	NA	8.6	
Barium	ug/L	15	<15	<15	<15		19	<15	19	<15	
CBOD5	mg/L	<2.0	<2.0	<2.0	2.1		2	9.3	8.3	7.4	
COD	mg/L	17	19	15	22		42	31	53	31	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Calcium	mg/L	69	63	61	62		67	64	67	60	
Chloride	mg/L	72.3	72	62	64.6		139	96.2	150	110	
Chromium	ug/L	<30	<30	<30	<30		<30	<30	<30	<30	
Conductivity	µmhos/cm	766	756	693	704		1140	894	1100	924	
Copper	ug/L	<10	<10	<10	<10		34	26	44	32	
Hardness, Total	mg/L	271	256	243	241		262	250	262	236	
Iron	ug/L	<50	79	<50	75		243	<50	75	<50	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Magnesium	mg/L	24	24	22	21		23	22	23	21	
Manganese	ug/L	22	40	22	38		12	<10	64	<10	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	
Nickel	ug/L	<40	<40	<40	<40		<40	<40	<40	<40	
Nitrate+nitrite	mg/L	0.15	8.38	6.15	8.95		21.3	10	3.9	14	
Nitrite	mg/L	<0.020	0.074	0.048	0.322		0.033	0.087	0.73	0.056	
Potassium	mg/L	12	12	11	13		16	11	15	15	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	
Sodium	mg/L	55	49	47	50		114	74	121	92	
Strontium	ug/L	168	136	145	159		179	166	183	165	
TKN	mg/L	1.65	1.63	1.26	2.24		1.64	1.35	8.54	1.46	
Total Dissolved Solids	mg/L	448	452	452	452		682	586	646	574	
Total Phosphorus	mg/L	1.2	4.18	2.18	3.09		4.36	2.96	4.05	4.74	
Total Suspended Solids	mg/L	<5	<5	<5	<5		8	<5	<5	<5	
Zinc	ug/L	87	70	67	69		24	20	36	27	
Field Measurements											
Temperature	°C	23.49	25.52	27.06	24.25		23.91	23.5	26.24	20.43	
Conductivity	µmhos/cm	760	705	689.8	670.8		1128.1	907	1173.7	962.9	
D.O. Saturation	%	87.5	82.3	89.9	86.6		85.7	92	65.8	89.3	
Dissolved Oxygen	mg/L	7.4	6.72	7.15	7.25		7.21	7.8	5.3	8.03	
pH	S.U.	7.42	7.82	7.69	7.76		7.46	7.77	7.41	7.97	

Appendix Table 1. Continued.

		Site Location: **HILLCREST NURSING HOME WWTP TO TRIB TO OHIO BRUSH CK (28.90)** River Mile: 0.1 Storet: X04S16				
Parameter	Units	6/25/2007 5:32 PM	7/30/2007 1:11 PM	8/8/2007 1:12 PM	9/12/2007 2:56 PM	8/14/2007 10:46 AM
Aluminum	ug/L	<200	<200	<200	<200	<200
Ammonia	mg/L	<0.050	0.071	<0.050	<0.050	<0.050
Arsenic	ug/L	4.7	5.7	5.8	4.2	5.7
BOD5	mg/L	13	NA	NA	<2.0	NA
Barium	ug/L	<15	<15	<15	<15	<15
CBOD5	mg/L	11	<2.0	<2.0	<2.0	<2.0
COD	mg/L	128	15	15	31	16
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20
Calcium	mg/L	67	63	66	59	66
Chloride	mg/L	228	81.3	80.8	72.3	73.1
Chromium	ug/L	<30	<30	<30	<30	<30
Conductivity	µmhos/cm	1560	890	938	988	969
Copper	ug/L	20	29	20	22	22
Hardness, Total	mg/L	241	227	239	217	239
Iron	ug/L	87	277	60	<50	102
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
Magnesium	mg/L	18	17	18	17	18
Manganese	ug/L	11	37	10	<10	<10
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	NA
Nickel	ug/L	<40	<40	<40	<40	<40
Nitrate+nitrite	mg/L	35.3	9.74	5.88	30.2	28.4
Nitrite	mg/L	<0.020	<0.020	<0.020	0.025	NA
Potassium	mg/L	19	20	22	22	22
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	mg/L	178	89	114	127	106
Strontium	ug/L	147	142	155	135	152
TKN	mg/L	1.45	1.11	1.37	1.35	1.31
Total Dissolved Solids	mg/L	936	536	612	716	648
Total Phosphorus	mg/L	5.97	6.13	6.97	8.63	7.68
Total Suspended Solids	mg/L	<5	12	7	<5	<5
Zinc	ug/L	60	25	<10	23	17
Field Measurements						
Temperature	°C	24.76	24.58	26.89	23.25	NA
Conductivity	µmhos/cm	1468.5	892.2	984.9	974.9	NA
D.O. Saturation	%	6.6	97.8	81.3	74.5	NA
Dissolved Oxygen	mg/L	0.54	8.13	6.47	6.34	NA
pH	S.U.	8.15	8.14	8.2	8.34	NA

UJ - The analyte was not detected above the sample quantitation limit (QL). However, the reported QL is estimated.

RC - The result is rejected because of poor correlation with its co-analyte.

B - Result is an estimate. Analyte was detected in the associated method/trip/field blank as well as in the sample.

Appendix Table 1. Continued.

Ohio Brush Creek Study Area 2007 Bacteria: Fecal Coliform							
Date Sampled Stream	River Mile	7/23/07	7/31/07	8/2/07	8/9/07	8/14/07	8/20/07
Ohio Brush Creek	54.70	<10	30 JL	NA	90 JL	NA	280
Ohio Brush Creek	52.49	90 JL	60 JL/110JL	NA	270 J	NA	10 JL
Ohio Brush Creek	47.16	50 JL	20 JL	NA	290	NA	240
Ohio Brush Creek	45.14	<10	10 JL	NA	40 J,JL	NA	10 JL
Ohio Brush Creek	40.40	10 JL	20 JL	NA	<10 UJ	NA	<10/ <10
Ohio Brush Creek	30.50	140 JL	200	NA	270	NA	80 J,JL
Ohio Brush Creek	25.00	40 JL/30JL	40 JL	NA	30 JL/ 20JL	NA	20 JL
Ohio Brush Creek	21.35	50 JL	150 JL	NA	70 JL	NA	<10
Ohio Brush Creek	15.20	40 JL	NA	<10	20 JL	NA	<10
Ohio Brush Creek	13.16	110 JL	NA	10 JL	30 JL	NA	10 JL
Ohio Brush Creek	10.00	30 JL	NA	10 JL	20 JL	NA	<10
Ohio Brush Creek	6.00	30 JL/30JL	140 JL	30 JL	70 JL	NA	<10
Ohio Brush Creek	0.50	<10/20JL	20 JL	130JL/110JL	90 JL	NA	30 JL/40JL
Shimer Run	2.18	3000	300	NA	110 JL	NA	50 JL
Beasley Fork	4.60	NA	NA	370	570	NA	180 JL
Beasley Fork	3.20	280	220	50 JL	120 JL	NA	50 JL
Beasley Fork	0.75	NA	370	190 JL	90 JL/80JL	NA	100 JL
Trib. to Beasley Fork (RM 4.60)	0.17	780 JL	290	260	40 JL	NA	40 JL
Moores Run	0.20	120 JL	70 JL/60JL	150 JL/ 270	20 JL	NA	<10
Cedar Run	0.38	NA	NA	360	270	NA	90 JL
Lick Fork	4.10	420	NA	60 JL	100 JL	NA	<10
Lick Fork	1.03	20 JL	140 JL	NA	3000	NA	10 JL
Trib.to Lick Fork (RM 4.02)	2.80	580	970 JL	NA	60000 E	NA	30000
Trib.to Lick Fork (RM 4.02)	0.10	870 JL	NA	440	450	NA	10 JL
Treber Run	0.10	20 JL	NA	10 JL	20 JL/ 20JL	NA	20 JL
Cave Run	0.10	90 JL	NA	210	950 JL	NA	80 JL
Bundle Run	0.68	20 JL	NA	NA	NA	NA	NA
Little East Fork	0.90	20 JL	290	NA	110 JL	NA	30 JL
Little East Fork	0.1	130 JL	160 JL	NA	80 JL	NA	470
Crooked Creek	2.2	90 JL	330	NA	180 JL	NA	70 JL
West Fork Ohio Brush Creek	20.53	60 JL	600	NA	90 JL	NA	20 JL
West Fork Ohio Brush Creek	17.92	210/200	740JL/790JL	NA	50 JL/80JL	NA	<10
West Fork Ohio Brush Creek	15.60	590	1200 JL	NA	730 JL	NA	180 JL
West Fork Ohio Brush Creek	12.74	180 JL	500	NA	210	NA	40 JL
West Fork Ohio Brush Creek	10.50	300/250	220	NA	270	NA	120 JL
West Fork Ohio Brush Creek	6.10	80 JL	230	NA	220	NA	40 JL
West Fork Ohio Brush Creek	1.10	250	1100JL/1600JL	NA	10 JL	NA	30 JL
West Fork Ohio Brush Creek	0.37	60 JL/60JL	130 JL	NA	20 JL	NA	10 JL/30JL
Trib. to W Fk Ohio Brush Cr (7.38)	0.80	740 JL	2100	NA	740 JL	NA	350
Georges Creek	3.20	910 JL	2300/1600JL	NA	130 JL	NA	110 JL
Georges Creek	0.10	340	70 JL/90JL	NA	20 JL/40JL	NA	190JL/130JL
Cherry Fork	8.74	2000	1800 JL	NA	410/ 260	NA	2000
Cherry Fork	7.50	550	120 JL	NA	NA	NA	760 JL
Cherry Fork	2.61	20 JL	330	NA	10 JL	NA	550
Grace Run	1.40	1700 JL	2000	NA	21000	NA	1900 JL
Buck Run	0.38	350	700 JL	NA	110 JL	NA	190 JL

Appendix Table 1. Continued.

Ohio Brush Creek Study Area 2007 Bacteria: Fecal Coliform							
Date Sampled Stream	River Mile	7/23/07	7/31/07	8/2/07	8/9/07	8/14/07	8/20/07
Little West Fork	6.26	510	430	NA	370	NA	NA
Little West Fork	5.70	280	360	NA	980 JL	NA	10 JL
Little West Fork	0.10	350	250	NA	640 JL	NA	70 JL
Elk Fork	1.61	290	800 JL	NA	190 JL	NA	170 JL
Elm Run	1.75	3400/2600	730 JL/650JL	NA	460/ 570	NA	60 JL
Elk Run	1.33	940 JL	600 JL	NA	120 JL	NA	20 JL
Elk Run	0.90	30 JL	10 JL	NA	110 J,JL	NA	250
Lost Fork	2.50	60 JL	430	NA	100 J,JL	NA	50 JL
Lost Fork	1.70	200	200	NA	270	NA	160 JL
Baker Fork	14.80	1700 JL	330	NA	260	NA	170 JL
Baker Fork	10.50	390	230	NA	350	NA	320
Baker Fork	1.49	170 JL	170 JL	NA	310	NA	30 JL/20JL
Middle Fork Baker Fork	5.40	510	580	NA	970 JL	NA	220
Middle Fork Baker Fork	0.20	90 JL	100 JL	NA	<10	NA	10 JL
Strait Creek	0.60	330	70 JL	NA	1000 JL	NA	2500
Muddy Fork	0.39	2400	1500 JL	NA	1200JL/1400JL	NA	2100
Wastewater Outfalls							
Peebles WWTP		400	10 JL	NA	<10	NA	60000 E
West Union WWTP		10	NA	10 JL	10 JL	NA	1100 JL
Seaman WWTP		570	300	NA	310	NA	190 JL
Hillcrest Nursing Home WWTP		10 JL	10 JL	NA	<10	<10	<10

Appendix Table 1. Continued.

Ohio Brush Creek Study Area 2007 Bacteria: E. Coli							
Date Sampled Stream	River Mile	7/23/07	7/31/07	8/2/07	8/9/07	8/14/07	8/20/07
Ohio Brush Creek	54.70	<10	10 JL	NA	80 JL	NA	120 JL
Ohio Brush Creek	52.49	70 JL	20 JL/ 60JL	NA	40 JL	NA	20 JL
Ohio Brush Creek	47.16	20 JL	10 JL	NA	250	NA	140 JL
Ohio Brush Creek	45.14	<10	<10	NA	<10	NA	<10
Ohio Brush Creek	40.40	<10	<10	NA	<10	NA	<10/ <10
Ohio Brush Creek	30.50	110 JL	60 JL	NA	200	NA	50 JL
Ohio Brush Creek	25.00	10 JL/ <10	40 JL	NA	10 JL/ 10JL	NA	<10
Ohio Brush Creek	21.35	40 JL	30 JL	NA	60 JL	NA	100 JL
Ohio Brush Creek	15.20	<10	NA	<10	20 JL	NA	<10
Ohio Brush Creek	13.16	50 JL	NA	<10	30 JL	NA	<10
Ohio Brush Creek	10.00	30 JL	NA	<10	30 JL	NA	<10
Ohio Brush Creek	6.00	40 JL/ 30JL	160 JL	50 JL	10 JL	NA	<10
Ohio Brush Creek	0.50	<10/ <10	10 JL	90 JL/ 60JL	10 JL	NA	10 JL/ 20JL
Shimer Run	2.18	2000	190 JL	NA	90 JL	NA	60 JL
Beasley Fork	4.60	NA	NA	240	280	NA	70 JL
Beasley Fork	3.20	100 JL	130 JL	50 JL	50 JL	NA	<10
Beasley Fork	0.75	NA	200	180 JL	60 JL/ 30JL	NA	20 JL
Trib. to Beasley Fork (RM 4.60)	0.17	410	160 JL	60 JL	20 JL	NA	20 JL
Moores Run	0.20	40 JL	30 JL/ 50JL	100 JL/120JL	10 JL	NA	<10
Cedar Run	0.38	NA	NA	110 JL	130 JL	NA	40 JL
Lick Fork	4.10	150 JL	NA	30 JL	100 JL	NA	<10
Lick Fork	1.03	10 JL	120 JL	NA	1800 JL	NA	20 JL
Trib.to Lick Fork (RM 4.02)	2.80	330	490	NA	80000 E	NA	12000 JL
Trib.to Lick Fork (RM 4.02)	0.10	630	NA	270	290	NA	<10
Treber Run	0.10	10 JL	NA	10 JL	40 JL/ 20JL	NA	<10
Cave Run	0.10	70 JL	NA	60 JL	770	NA	50 JL
Bundle Run	0.68	10 JL	NA	NA	NA	NA	NA
Little East Fork	0.90	10 JL	170 JL	NA	20 JL	NA	<10
Little East Fork	0.1	60 JL	110 JL	NA	70 JL	NA	370
Crooked Creek	2.2	20 JL	230	NA	30 JL	NA	40 JL
West Fork Ohio Brush Creek	20.53	80 JL	360	NA	40 JL	NA	<10
West Fork Ohio Brush Creek	17.92	180JL/ 160JL	540/ 440	NA	30 JL/ 70JL	NA	10 JL
West Fork Ohio Brush Creek	15.60	630	610	NA	580	NA	80 JL
West Fork Ohio Brush Creek	12.74	<10	330	NA	170 JL	NA	10 JL
West Fork Ohio Brush Creek	10.50	90 JL/ 160JL	220	NA	200	NA	30 JL
West Fork Ohio Brush Creek	6.10	30 JL	20 JL	NA	40 JL	NA	30 JL
West Fork Ohio Brush Creek	1.10	10 JL	1100JL/1600JL	NA	20 JL	NA	10 JL
West Fork Ohio Brush Creek	0.37	40 JL/ 40JL	60 JL	NA	10 JL	NA	<10/ 10JL
Trib. to W Fk Ohio Brush Cr (7.38)	0.80	430	1500 JL	NA	380	NA	100 JL
Georges Creek	3.20	320	1100JL/900JL	NA	60 JL	NA	80 JL
Georges Creek	0.10	140 JL	70 JL/ 30JL	NA	10 JL/ 20JL	NA	110 JL/ 90JL
Cherry Fork	8.74	2000	430	NA	150 JL/100JL	NA	350 J
Cherry Fork	7.50	130 JL	80 JL	NA	NA	NA	100 JL
Cherry Fork	2.61	<10	230	NA	20 JL	NA	310
Grace Run	1.40	800	1600 JL	NA	22000	NA	400 J,JL
Buck Run	0.38	190 JL	580	NA	60 JL	NA	70 JL

Appendix Table 1. Continued.

Ohio Brush Creek Study Area 2007 Bacteria: E. Coli							
Date Sampled		7/23/07	7/31/07	8/2/07	8/9/07	8/14/07	8/20/07
Stream	River Mile						
Little West Fork	6.26	400	220	NA	160 JL	NA	NA
Little West Fork	5.70	90 JL	130 JL	NA	780	NA	10 JL
Little West Fork	0.10	300	120 JL	NA	390	NA	20 JL
Elk Fork	1.61	80 JL	550	NA	90 JL	NA	60 JL
Elm Run	1.75	1700JL/1500	630/ 420	NA	340/ 370	NA	40 JL
Elk Run	1.33	460	210	NA	30 JL	NA	20 JL
Elk Run	0.90	10 JL	10 JL	NA	90 JL	NA	140 JL
Lost Fork	2.50	<10	240	NA	120 JL	NA	20 JL
Lost Fork	1.70	120 JL	50 JL	NA	170 JL	NA	180 JL
Baker Fork	14.80	1000 JL	30 JL	NA	220	NA	120 JL
Baker Fork	10.50	320	140 JL	NA	190 JL	NA	170 JL
Baker Fork	1.49	120 JL	110 JL	NA	130 JL	NA	20 JL/ 20JL
Middle Fork Baker Fork	5.40	250	300	NA	530	NA	150 JL
Middle Fork Baker Fork	0.20	50 JL	40 JL	NA	10 JL	NA	<10
Strait Creek	0.60	160 JL	20 JL	NA	580	NA	1700 JL
Muddy Fork	0.39	1700 JL	920 JL	NA	1500JL/1700JL	NA	2100
Wastewater Outfalls							
Peebles WWTP		150 JL	<10	NA	<10	NA	57000
West Union WWTP		<10	NA	<10	10 JL	NA	580
Seaman WWTP		230	110 JL	NA	40 JL	NA	20 JL
Hillcrest Nursing Home WWTP		<10	<10	NA	<10	<10	<10

J - The analyte was positively identified, the associated numerical value is estimated.

JL - Result is estimated because it has been computed using a colony count that is not within the acceptable count range

E - Analyte was quantified but the concentration exceeds the instruments callibration range for that specific analysis.

< - Less than detection limit;

NA - Not analyzed

Appendix Table 2. Surface water results for semivolatile organic compounds, pesticides, and PCBs from the Ohio Brush Creek study area, 2007.

Stream	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**
River Mile	**45.14**	**45.14**	**40.4**	**40.4**	**25.0**	**25.0**
Date Sampled	6/25/2007	8/22/2007	6/25/2007	8/22/2007	6/25/2007	8/22/2007
STORET Number	X04S22	X04S22	X04G01	X04G01	X04S19	X04S19
Semivolatile Organic Compounds (ug/l)						
Acenaphthene	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Acenaphthylene	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Anthracene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Benzo[a]anthracene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Benzo[a]pyrene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Benzo[b]fluoranthene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Benzo[g,h,i]perylene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Benzo[k]fluoranthene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
bis(2-Chloroethoxy)methane	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
bis(2-Chloroethyl)ether	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
bis(2-Chloroisopropyl)ether	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
bis(2-Ethylhexyl)phthalate	<10.2	<10.4	<10.6	<10.2	<11.6	<10.6
4-Bromophenyl-phenylether	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Butylbenzylphthalate	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
4-Chloro-3-methylphenol	<10.2	<10.4	<10.6	<10.2	<11.6	<10.6
2-Chloronaphthalene	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
2-Chlorophenol	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
4-Chlorophenyl-phenylether	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Chrysene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Di-n-butylphthalate	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Di-n-octylphthalate	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Dibenz[a,h]anthracene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
1,3-Dichlorobenzene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
1,4-Dichlorobenzene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
1,2-Dichlorobenzene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
2,4-Dichlorophenol	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Diethylphthalate	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
2,4-Dimethylphenol	<10.2	<10.4	<10.6	<10.2	<11.6	<10.6
Dimethylphthalate	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
4,6-Dinitro-2-methylphenol	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
2,4-Dinitrophenol	<20.5	<20.8	<21.3	<20.3	<23.2	<21.2
2,6-Dinitrotoluene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
2,4-Dinitrotoluene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Fluoranthene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Fluorene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Hexachlorobenzene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Hexachlorobutadiene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Hexachlorocyclopentadiene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Hexachloroethane	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Indeno[1,2,3-cd]pyrene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Isophorone	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
N-Nitroso-di-n-propylamine	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
N-Nitrosodiphenylamine	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Naphthalene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1

Appendix Table 2. Continued.

Stream River Mile Date Sampled Time Sampled	**Ohio Brush Creek** **45.14** 6/25/2007 X04S22	**Ohio Brush Creek** **45.14** 8/22/2007 X04S22	**Ohio Brush Creek** **40.4** 6/25/2007 X04G01	**Ohio Brush Creek** **40.4** 8/22/2007 X04G01	**Ohio Brush Creek** **25.0** 6/25/2007 X04S19	**Ohio Brush Creek** **25.0** 8/22/2007 X04S19
Semivolatile Organic Compounds (ug/l)						
Nitrobenzene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
2-Nitrophenol	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
4-Nitrophenol	<20.5	<20.8	<21.3	<20.3	<23.2	<21.2
Pentachlorophenol	<10.2	<10.4	<10.6	<10.2	<11.6	<10.6
Phenanthrene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Phenol	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
Pyrene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
1,2,4-Trichlorobenzene	<2.1	<2.1	<2.1	<2.0	<2.3	<2.1
2,4,6-Trichlorophenol	<5.1	<5.2	<5.3	<5.1	<5.8	<5.3
Pesticides (ug/l)						
Aldrin	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
a-BHC	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
b-BHC	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
d-BHC	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
y-BHC	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
4,4'-DDD	<0.0064	<0.0062	<0.0063	<0.0062	<0.0067	<0.0062
4,4'-DDE	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
4,4'-DDT	<0.0064	<0.0062	<0.0063	<0.0062	<0.0067	<0.0062
Dieldrin	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
Endosulfan I	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
Endosulfan II	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
Endosulfan sulfate	<0.022	<0.021	<0.021	<0.020	<0.022	<0.021
Endrin	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
Endrin aldehyde	<0.0064	<0.0062	<0.0063	<0.0062	<0.0067	<0.0062
Heptachlor	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
Heptachlor epoxide	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
Methoxychlor	<0.011	<0.010	<0.010	<0.010	<0.011	<0.010
Mirex	<0.011	<0.010	<0.010	<0.010	<0.011	<0.010
Hexachlorobenzene	<0.0022	<0.0021	<0.0021	<0.0020	<0.0022	<0.0021
PCBs (ug/l)						
PCB-1016	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10
PCB-1221	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10
PCB-1232	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10
PCB-1242	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10
PCB-1248	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10
PCB-1254	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10
PCB-1260	<0.11	<0.10	<0.11	<0.10	<0.11	<0.10

Appendix Table 2. Continued.

Stream	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Lick Fork	Lick Fork
River Mile	**15.2**	**15.2**	**13.2**	**13.2**	**4.1**	**1.0**
Date Sampled	6/25/2007	8/22/2007	6/25/2007	8/22/2007	6/25/2007	6/25/2007
STORET Number	X04S18	X04S18	600660	600660	X99Q05	X04P09
Semivolatile Organic Compounds (ug/l)						
Acenaphthene	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Acenaphthylene	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Anthracene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Benzo[a]anthracene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Benzo[a]pyrene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Benzo[b]fluoranthene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Benzo[g,h,i]perylene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Benzo[k]fluoranthene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
bis(2-Chloroethoxy)methane	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
bis(2-Chloroethyl)ether	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
bis(2-Chloroisopropyl)ether	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
bis(2-Ethylhexyl)phthalate	<10.2	<10.4	<10.2	<11.0	<10.2	<11.1
4-Bromophenyl-phenylether	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Butylbenzylphthalate	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
4-Chloro-3-methylphenol	<10.2	<10.4	<10.2	<11.0	<10.2	<11.1
2-Chloronaphthalene	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
2-Chlorophenol	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
4-Chlorophenyl-phenylether	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Chrysene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Di-n-butylphthalate	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Di-n-octylphthalate	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Dibenz[a,h]anthracene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
1,3-Dichlorobenzene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
1,4-Dichlorobenzene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
1,2-Dichlorobenzene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
2,4-Dichlorophenol	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Diethylphthalate	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
2,4-Dimethylphenol	<10.2	<10.4	<10.2	<11.0	<10.2	<11.1
Dimethylphthalate	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
4,6-Dinitro-2-methylphenol	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
2,4-Dinitrophenol	<20.5	<20.7	<20.5	<22.0	<20.4	<22.2
2,6-Dinitrotoluene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
2,4-Dinitrotoluene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Fluoranthene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Fluorene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Hexachlorobenzene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Hexachlorobutadiene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Hexachlorocyclopentadiene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Hexachloroethane	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Indeno[1,2,3-cd]pyrene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Isophorone	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
N-Nitroso-di-n-propylamine	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
N-Nitrosodiphenylamine	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Naphthalene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2

Appendix Table 2. Continued.

Stream	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Lick Fork	Lick Fork
River Mile	**15.2**	**15.2**	**13.2**	**13.2**	**4.1**	**1.03**
Date Sampled	6/25/2007	8/22/2007	6/25/2007	8/22/2007	6/25/2007	6/25/2007
Time Sampled	X04S18	X04S18	600660	600660	X99Q05	X04P09
Semivolatile Organic Compounds (ug/l)						
Nitrobenzene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
2-Nitrophenol	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
4-Nitrophenol	<20.5	<20.7	<20.5	<22.0	<20.4	<22.2
Pentachlorophenol	<10.2	<10.4	<10.2	<11.0	<10.2	<11.1
Phenanthrene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Phenol	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
Pyrene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
1,2,4-Trichlorobenzene	<2.1	<2.1	<2.1	<2.2	<2.0	<2.2
2,4,6-Trichlorophenol	<5.1	<5.2	<5.1	<5.5	<5.1	<5.6
Pesticides (ug/l)						
Aldrin	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
a-BHC	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
b-BHC	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
d-BHC	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
y-BHC	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
4,4'-DDD	<0.0062	<0.0061	<0.0064	<0.0066	<0.0064	<0.0063
4,4'-DDE	<0.0021	<0.0020	<0.0021	<0.0022	0.0053	<0.0021
4,4'-DDT	<0.0062	<0.0061	<0.0064	<0.0066	<0.0064	<0.0063
Dieldrin	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
Endosulfan I	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
Endosulfan II	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
Endosulfan sulfate	<0.021	<0.020	<0.021	<0.022	<0.021	<0.021
Endrin	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
Endrin aldehyde	<0.0062	<0.0061	<0.0064	<0.0066	<0.0064	<0.0063
Heptachlor	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
Heptachlor epoxide	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
Methoxychlor	<0.010	<0.010	<0.011	<0.011	<0.011	<0.010
Mirex	<0.010	<0.010	<0.011	<0.011	<0.011	<0.010
Hexachlorobenzene	<0.0021	<0.0020	<0.0021	<0.0022	<0.0021	<0.0021
PCBs (ug/l)						
PCB-1016	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11
PCB-1221	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11
PCB-1232	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11
PCB-1242	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11
PCB-1248	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11
PCB-1254	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11
PCB-1260	<0.10	<0.10	<0.11	<0.11	<0.11	<0.11

Appendix Table 2. Continued.

Stream	Lick Fork	Treber Run	Cave Run	Little East Fork	W. Fork Ohio Brush Creek	W. Fork Ohio Brush Creek
River Mile	**1.03**	**0.1**	**0.1**	**0.9**	**12.74**	**1.10**
Date Sampled	8/22/2007	6/25/2007	6/25/2007	6/25/2007	6/25/2007	6/25/2007
STORET Number	X04P09	X04P12	X99Q07	X04P04	X04S28	X99Q08
Semivolatile Organic Compounds (ug/l)						
Acenaphthene	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Acenaphthylene	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Anthracene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Benzo[a]anthracene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Benzo[a]pyrene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Benzo[b]fluoranthene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Benzo[g,h,i]perylene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Benzo[k]fluoranthene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
bis(2-Chloroethoxy)methane	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
bis(2-Chloroethyl)ether	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
bis(2-Chloroisopropyl)ether	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
bis(2-Ethylhexyl)phthalate	<10.0	<11.5	<10.5	<10.1	<10.8	<10.4
4-Bromophenyl-phenylether	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Butylbenzylphthalate	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
4-Chloro-3-methylphenol	<10.0	<11.5	<10.5	<10.1	<10.8	<10.4
2-Chloronaphthalene	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
2-Chlorophenol	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
4-Chlorophenyl-phenylether	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Chrysene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Di-n-butylphthalate	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Di-n-octylphthalate	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Dibenz[a,h]anthracene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
1,3-Dichlorobenzene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
1,4-Dichlorobenzene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
1,2-Dichlorobenzene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
2,4-Dichlorophenol	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Diethylphthalate	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
2,4-Dimethylphenol	<10.0	<11.5	<10.5	<10.1	<10.8	<10.4
Dimethylphthalate	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
4,6-Dinitro-2-methylphenol	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
2,4-Dinitrophenol	<20.1	<23.0	<21.0	<20.2	<21.5	<20.8
2,6-Dinitrotoluene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
2,4-Dinitrotoluene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Fluoranthene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Fluorene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Hexachlorobenzene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Hexachlorobutadiene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Hexachlorocyclopentadiene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Hexachloroethane	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Indeno[1,2,3-cd]pyrene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Isophorone	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
N-Nitroso-di-n-propylamine	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
N-Nitrosodiphenylamine	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Naphthalene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1

Appendix Table 2. Continued.

Stream	Lick Fork	Treber Run	Cave Run	Little East Fork	W. Fork Ohio Brush Creek	W. Fork Ohio Brush Creek
River Mile	**1.03**	**0.1**	**0.1**	**0.9**	**12.74**	**1.10**
Date Sampled	8/22/2007	6/25/2007	6/25/2007	6/25/2007	6/25/2007	6/25/2007
Time Sampled	X04P09	X04P12	X99Q07	X04P04	X04S28	X99Q08
Semivolatile Organic Compounds (ug/l)						
Nitrobenzene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
2-Nitrophenol	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
4-Nitrophenol	<20.1	<23.0	<21.0	<20.2	<21.5	<20.8
Pentachlorophenol	<10.0	<11.5	<10.5	<10.1	<10.8	<10.4
Phenanthrene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Phenol	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
Pyrene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
1,2,4-Trichlorobenzene	<2.0	<2.3	<2.1	<2.0	<2.2	<2.1
2,4,6-Trichlorophenol	<5.0	<5.8	<5.3	<5.1	<5.4	<5.2
Pesticides (ug/l)						
Aldrin	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
a-BHC	<0.0021	<0.0024	0.0022	<0.0021	<0.0023	<0.0023
b-BHC	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
d-BHC	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
y-BHC	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
4,4'-DDD	<0.0062	<0.0072	<0.0064	<0.0062	<0.0069	<0.0070
4,4'-DDE	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
4,4'-DDT	<0.0062	<0.0072	<0.0064	<0.0062	<0.0069	<0.0070
Dieldrin	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
Endosulfan I	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
Endosulfan II	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
Endosulfan sulfate	<0.021	<0.024	<0.021	<0.021	<0.023	<0.023
Endrin	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
Endrin aldehyde	<0.0062	<0.0072	<0.0064	<0.0062	<0.0069	<0.0070
Heptachlor	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
Heptachlor epoxide	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	0.0032
Methoxychlor	<0.010	<0.012	<0.011	<0.010	<0.012	<0.012
Mirex	<0.010	<0.012	<0.011	<0.010	<0.012	<0.012
Hexachlorobenzene	<0.0021	<0.0024	<0.0021	<0.0021	<0.0023	<0.0023
PCBs (ug/l)						
PCB-1016	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12
PCB-1221	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12
PCB-1232	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12
PCB-1242	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12
PCB-1248	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12
PCB-1254	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12
PCB-1260	<0.10	<0.12	<0.11	<0.10	<0.12	<0.12

Appendix Table 2. Continued.

Stream	W. Fork Ohio Brush Creek	W. Fork Ohio Brush Creek	W. Fork Ohio Brush Creek	Cherry Fork	Baker Fork	Baker Fork
River Mile	**1.10**	**0.37**	**0.37**	**2.61**	**1.49**	**1.49**
Date Sampled	8/22/2007	6/25/2007	8/22/2007	6/25/2007	6/25/2007	8/22/2007
STORET Number	X99Q08	X04S25	X04S25	X04P07	X04G02	X04G02
Semivolatile Organic Compounds (ug/l)						
Acenaphthene	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Acenaphthylene	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Anthracene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Benzo[a]anthracene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Benzo[a]pyrene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Benzo[b]fluoranthene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Benzo[g,h,i]perylene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Benzo[k]fluoranthene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
bis(2-Chloroethoxy)methane	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
bis(2-Chloroethyl)ether	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
bis(2-Chloroisopropyl)ether	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
bis(2-Ethylhexyl)phthalate	<10.0	<10.8	<10.1	<10.2	<10.2	<10.0
4-Bromophenyl-phenylether	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Butylbenzylphthalate	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
4-Chloro-3-methylphenol	<10.0	<10.8	<10.1	<10.2	<10.2	<10.0
2-Chloronaphthalene	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
2-Chlorophenol	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
4-Chlorophenyl-phenylether	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Chrysene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Di-n-butylphthalate	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Di-n-octylphthalate	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Dibenz[a,h]anthracene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
1,3-Dichlorobenzene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
1,4-Dichlorobenzene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
1,2-Dichlorobenzene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
2,4-Dichlorophenol	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Diethylphthalate	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
2,4-Dimethylphenol	<10.0	<10.8	<10.1	<10.2	<10.2	<10.0
Dimethylphthalate	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
4,6-Dinitro-2-methylphenol	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
2,4-Dinitrophenol	<20.1	<21.5	<20.2	<20.5	<20.4	<20.1
2,6-Dinitrotoluene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
2,4-Dinitrotoluene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Fluoranthene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Fluorene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Hexachlorobenzene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Hexachlorobutadiene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Hexachlorocyclopentadiene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Hexachloroethane	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Indeno[1,2,3-cd]pyrene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Isophorone	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
N-Nitroso-di-n-propylamine	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
N-Nitrosodiphenylamine	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Naphthalene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0

Appendix Table 2. Continued.

Stream	W. Fork Ohio Brush Creek	W. Fork Ohio Brush Creek	W. Fork Ohio Brush Creek	Cherry Fork	Baker Fork	Baker Fork
River Mile	**1.10**	**0.37**	**0.37**	**2.61**	**1.49**	**1.49**
Date Sampled	8/22/2007	6/25/2007	8/22/2007	6/25/2007	6/25/2007	8/22/2007
Time Sampled	X99Q08	X04S25	X04S25	X04P07	X04G02	X04G02
Semivolatile Organic Compounds (ug/l)						
Nitrobenzene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
2-Nitrophenol	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
4-Nitrophenol	<20.1	<21.5	<20.2	<20.5	<20.4	<20.1
Pentachlorophenol	<10.0	<10.8	<10.1	<10.2	<10.2	<10.0
Phenanthrene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Phenol	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
Pyrene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
1,2,4-Trichlorobenzene	<2.0	<2.2	<2.0	<2.1	<2.0	<2.0
2,4,6-Trichlorophenol	<5.0	<5.4	<5.1	<5.1	<5.1	<5.0
Pesticides (ug/l)						
Aldrin	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
a-BHC	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
b-BHC	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
d-BHC	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
y-BHC	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
4,4'-DDD	<0.0062	<0.0065	<0.0063	<0.0063	<0.0062	<0.0062
4,4'-DDE	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
4,4'-DDT	<0.0062	<0.0065	<0.0063	<0.0063	<0.0062	<0.0062
Dieldrin	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
Endosulfan I	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
Endosulfan II	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
Endosulfan sulfate	<0.021	<0.022	<0.021	<0.021	<0.021	<0.021
Endrin	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
Endrin aldehyde	<0.0062	<0.0065	<0.0063	<0.0063	<0.0062	<0.0062
Heptachlor	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
Heptachlor epoxide	<0.0021	<0.0022	<0.0021	0.0024	<0.0021	<0.0021
Methoxychlor	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010
Mirex	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010
Hexachlorobenzene	<0.0021	<0.0022	<0.0021	<0.0021	<0.0021	<0.0021
PCBs (ug/l)						
PCB-1016	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10
PCB-1221	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10
PCB-1232	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10
PCB-1242	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10
PCB-1248	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10
PCB-1254	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10
PCB-1260	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10

< - Not detected at or above the method detection limit (MDL value reported with the less than symbol).

Appendix Table 3. Hourly river measurements of dissolved oxygen, pH, temperature, and conductivity at three locations in the Ohio Brush Creek study area using Datasonde© continuous recorders, August 14-16, 2007.

OHIO BRUSH CREEK - RM 25.0					
Date M/DD/YEAR	Time HHMM	Temp. °C	pH SU	Spec.Conduct. mS/cm	D.O. mg/l
8/14/07	20:00	26.22	8.11	0.429	7.29
8/14/07	21:00	25.34	8.02	0.432	6.64
8/14/07	22:00	24.58	7.98	0.433	6.43
8/14/07	23:00	23.98	7.96	0.433	6.40
8/15/07	0:00	23.75	7.95	0.433	6.38
8/15/07	1:00	23.42	7.94	0.433	6.39
8/15/07	2:00	23.27	7.93	0.433	6.35
8/15/07	3:00	22.95	7.91	0.434	6.29
8/15/07	4:00	22.81	7.90	0.434	6.27
8/15/07	5:00	22.58	7.90	0.433	6.31
8/15/07	6:00	22.31	7.90	0.433	6.38
8/15/07	7:00	22.19	7.90	0.433	6.41
8/15/07	8:00	22.22	7.94	0.432	6.90
8/15/07	9:00	22.66	8.02	0.433	7.72
8/15/07	10:00	23.49	8.10	0.430	8.41
8/15/07	11:00	24.93	8.19	0.427	9.14
8/15/07	12:00	27.31	8.26	0.424	9.93
8/15/07	13:00	29.33	8.31	0.422	10.47
8/15/07	14:00	30.96	8.36	0.417	10.78
8/15/07	15:00	32.01	8.38	0.416	10.46
8/15/07	16:00	32.48	8.38	0.414	10.13
8/15/07	17:00	31.96	8.34	0.418	9.45
8/15/07	18:00	31.20	8.28	0.421	8.88
8/15/07	19:00	29.94	8.14	0.428	7.35
8/15/07	20:00	29.11	8.04	0.433	6.49
8/15/07	21:00	28.29	7.95	0.436	5.84
8/15/07	22:00	27.46	7.91	0.438	5.69
8/15/07	23:00	26.81	7.88	0.438	5.65
8/16/07	0:00	26.21	7.88	0.438	5.75
8/16/07	1:00	25.70	7.87	0.438	5.81
8/16/07	2:00	25.26	7.86	0.439	5.85
8/16/07	3:00	24.95	7.86	0.439	5.91
8/16/07	4:00	24.72	7.84	0.438	5.93
8/16/07	5:00	24.51	7.84	0.438	5.97
8/16/07	6:00	24.49	7.85	0.438	5.96
8/16/07	7:00	24.37	7.83	0.438	5.86
8/16/07	8:00	24.46	7.89	0.437	6.55
8/16/07	9:00	24.84	7.96	0.434	7.28
8/16/07	10:00	25.62	8.04	0.431	8.08
8/16/07	11:00	26.96	8.14	0.426	9.04
8/16/07	12:00	29.62	8.21	0.421	10.00

Appendix Table 3. Continued.

OHIO BRUSH CREEK - RM 13.16					
Date M/DD/YEAR	Time HHMM	Temp. ˚C	pH SU	Spec.Conduct. mS/cm	D.O. mg/l
8/14/07	20:00	26.30	7.95	0.431	8.41
8/14/07	21:00	26.35	7.90	0.431	8.17
8/14/07	22:00	26.21	7.96	0.430	8.52
8/14/07	23:00	25.91	7.92	0.433	7.85
8/15/07	0:00	25.52	7.89	0.429	7.39
8/15/07	1:00	25.23	7.86	0.430	7.12
8/15/07	2:00	24.86	7.80	0.432	6.69
8/15/07	3:00	24.55	7.83	0.432	6.83
8/15/07	4:00	24.34	7.80	0.432	6.50
8/15/07	5:00	24.11	7.76	0.434	5.98
8/15/07	6:00	23.87	7.79	0.433	6.29
8/15/07	7:00	23.65	7.80	0.433	6.32
8/15/07	8:00	23.42	7.75	0.435	5.90
8/15/07	9:00	23.46	7.83	0.431	6.51
8/15/07	10:00	23.83	7.88	0.431	6.95
8/15/07	11:00	24.16	7.86	0.433	7.41
8/15/07	12:00	24.51	7.86	0.435	7.63
8/15/07	13:00	24.93	7.90	0.434	8.53
8/15/07	14:00	25.11	7.96	0.433	8.81
8/15/07	15:00	25.43	7.93	0.434	8.31
8/15/07	16:00	25.56	7.99	0.435	9.90
8/15/07	17:00	25.96	8.02	0.431	9.83
8/15/07	18:00	26.04	8.00	0.432	9.39
8/15/07	19:00	26.08	8.04	0.431	10.13
8/15/07	20:00	26.13	8.01	0.431	9.92
8/15/07	21:00	25.89	7.96	0.433	9.43
8/15/07	22:00	26.20	7.94	0.431	9.06
8/15/07	23:00	26.13	7.92	0.433	8.99
8/16/07	0:00	26.27	7.91	0.433	8.95
8/16/07	1:00	26.27	7.82	0.436	7.80
8/16/07	2:00	26.37	7.78	0.441	7.29
8/16/07	3:00	26.15	7.76	0.443	6.90
8/16/07	4:00	26.00	7.74	0.444	6.85
8/16/07	5:00	25.81	7.72	0.444	6.61
8/16/07	6:00	25.63	7.71	0.445	6.29
8/16/07	7:00	25.45	7.68	0.445	5.91
8/16/07	8:00	25.32	7.68	0.446	5.89
8/16/07	9:00	25.38	7.68	0.448	5.86
8/16/07	10:00	25.62	7.71	0.447	6.13
8/16/07	11:00	25.77	7.73	0.447	6.76
8/16/07	12:00	26.18	7.78	0.446	7.23
8/16/07	13:00	26.39	7.82	0.446	7.59

Appendix Table 3. Continued.

BEASLEY FORK - RM 0.75					
Date M/DD/YEAR	Time HHMM	Temp. °C	pH SU	Spec.Conduct. mS/cm	D.O. mg/l
8/14/07	20:00	24.18	7.85	0.637	7.15
8/14/07	21:00	23.69	7.82	0.639	6.40
8/14/07	22:00	23.19	7.82	0.637	6.50
8/14/07	23:00	22.79	7.80	0.639	6.11
8/15/07	0:00	22.52	7.81	0.638	6.05
8/15/07	1:00	22.30	7.79	0.638	6.26
8/15/07	2:00	22.13	7.78	0.639	6.12
8/15/07	3:00	21.93	7.77	0.638	6.10
8/15/07	4:00	21.70	7.76	0.639	5.88
8/15/07	5:00	21.55	7.74	0.641	5.73
8/15/07	6:00	21.33	7.73	0.641	5.75
8/15/07	7:00	21.15	7.73	0.643	5.40
8/15/07	8:00	21.10	7.73	0.641	5.71
8/15/07	9:00	21.24	7.76	0.640	5.86
8/15/07	10:00	21.59	7.78	0.642	6.37
8/15/07	11:00	22.27	7.80	0.640	7.10
8/15/07	12:00	22.85	7.85	0.634	7.10
8/15/07	13:00	23.15	7.85	0.634	7.69
8/15/07	14:00	23.42	7.87	0.634	8.41
8/15/07	15:00	23.54	7.87	0.637	8.37
8/15/07	16:00	24.10	7.91	0.634	9.04
8/15/07	17:00	24.66	7.90	0.633	9.42
8/15/07	18:00	25.07	7.94	0.630	9.46
8/15/07	19:00	24.71	7.95	0.637	8.73
8/15/07	20:00	24.95	7.90	0.636	8.21
8/15/07	21:00	24.89	7.96	0.634	9.04
8/15/07	22:00	24.77	7.85	0.638	7.59
8/15/07	23:00	24.68	7.80	0.643	6.32
8/16/07	0:00	24.38	7.78	0.644	5.97
8/16/07	1:00	24.09	7.77	0.645	5.88
8/16/07	2:00	23.85	7.78	0.643	6.07
8/16/07	3:00	23.61	7.77	0.643	5.88
8/16/07	4:00	23.52	7.76	0.642	5.90
8/16/07	5:00	23.29	7.77	0.643	6.07
8/16/07	6:00	23.44	7.74	0.644	5.72
8/16/07	7:00	23.29	7.74	0.645	5.48
8/16/07	8:00	23.31	7.73	0.644	5.65
8/16/07	9:00	23.31	7.75	0.644	5.62
8/16/07	10:00	23.42	7.73	0.644	5.66
8/16/07	11:00	23.70	7.73	0.643	5.99

Appendix Table 4. Sediment results (metals, nutrients) from 13 locations sampled in the Ohio Brush Creek study area, 2007.

Stream	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**WF Ohio Brush Cr.**	**WF Ohio Brush Cr.**
River Mile	**45.1**	**40.4**	**25.0**	**15.2**	**13.2**	**12.7**	**1.1**
STORET Number	X04S22	X04G01	X04S19	X04S18	600660	X04S28	X99Q08
Date Sampled	8/13/2007	8/13/2007	8/22/2007	8/22/2007	8/22/2007	8/13/2007	8/22/2007
Time Sampled	2:11 PM	2:40 PM	12:45 PM	11:30 AM	11:05 AM	3:15 PM	1:20 PM
Metals (mg/kg)							
Aluminum	3320	4140	4010	5240	7660	11800	5710
Arsenic	NA	NA	16.3	11.4	12.5	4.15	45.9
Barium	25.3	77.6	38.0	45.5	65.6	50.6	99.3
Cadmium	NA	NA	0.108	0.130	0.168	<0.099	0.260
Calcium	34100 J	53700	48100	56500	26900	30200	45700
Chromium	<19	<21	<15	<19	13	17	31
Copper	<6.2	14.3	5.3	7.5	9.9	14.7	8.0
Iron	16200	42600	23500	19900	23600	23700	55500
Lead	8.41 J	23.7	13.5	12.3	19.0	6.47	22.4
Magnesium	9720 J	23300	9720	7110	9520	10600	2510
Manganese	492	993	643	662	804	1060	1800
Mercury	0.165	<0.035	0.147	0.025	0.033	<0.031	<0.025
Nickel	<25	<28	<20	<26	16	21	<23
Potassium	<1240	<1410	<1020	<1290	981	2020	<1130
Selenium	NA	NA	<1.02	<1.29	<0.79	<0.99	<1.13
Sodium	<3090	<3520	<2550	<3220	<1980	<2470	<2820
Strontium	23	28	38	35	22	44	44
Zinc	21.6	114	34.4	38.6	51.5	54.3	37.7
Other							
Ammonia (mg/kg)	53	70	38	66	41	54	140
Phosphorus - Total (mg/kg)	349	411	770 J	562	494	1160	688
Percent Solids	70.3	59.2	67.7	64.8	61.7	63.3	70.8

Stream	**WF Ohio Brush Cr.**	**Baker Fork**	**Cherry Fork**	**Lick Fork**	**Treber Run**	**Little East Fork**
River Mile	**0.4**	**1.5**	**2.6**	**1.0**	**0.1**	**0.9**
STORET Number	X04S25	X04G02	X04P07	X04P09	X04P12	X04P04
Date Sampled	8/22/2007	8/22/2007	8/13/2007	8/14/2007	8/14/2007	8/13/2007
Time Sampled	1:35 PM	10:40 AM	4:05 PM	10:00 AM	9:30 AM	12:10 PM
Metals (mg/kg)						
Aluminum	7820	10200	11300	6400	7400	12400
Arsenic	7.87	13.1	10.2	NA	NA	NA
Barium	63.1	139	107	54.0	98.8	31.3
Cadmium	<0.120	1.71	<0.214	NA	NA	NA
Calcium	17600	24000	97900	50200	54700	50100
Chromium	<18	<39	<32	18	<25	23
Copper	8.3	16.8	11.3	11.5	10.9	21.7
Iron	18400	23400	24600	48100	26800	27300
Lead	12.9	22.1	13.9	14.8	12.1	8.01
Magnesium	3980	9760	9640	10500	12600	17700
Manganese	619	1120	1580	840	1240	755
Mercury	0.041	<0.047	<0.069	<0.025	<0.042	0.446
Nickel	<24	<52	<43	<22	<33	27
Potassium	<1200	<2600	2410	1100	<1630	2590
Selenium	<1.20	<2.60	<2.14	NA	NA	NA
Sodium	<3000	<6490	<5360	<2720	<4080	<2900
Strontium	22	<39	95	43	56	60
Zinc	33.2	162	75.5	43.2	50.8	58.4
Other						
Ammonia (mg/kg)	40	180	150	54	120	49
Phosphorus - Total (mg/kg)	677	736	872	750	622	804
Percent Solids	64.0	33.5	33.9	62.4	49.0	55.6

J - Estimated due to high or poor matrix spike recoveries.

NA - Not analyzed.

Appendix Table 5. Sediment sampling results for semivolatile and volatile organic compounds, pesticides, and PCBs, from the Ohio Brush Creek study area, 2007. NA = not analyzed.

Stream	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**WF Ohio Brush Cr.**	**WF Ohio Brush Cr.**
River Mile	**45.1**	**40.4**	**25.0**	**15.2**	**13.2**	**12.7**	**1.1**
STORET Number	X04S22	X04G01	X04S19	X04S18	600660	X04S28	X99Q08
Date Sampled	8/13/2007	8/13/2007	8/22/2007	8/22/2007	8/22/2007	8/13/2007	8/22/2007
Time Sampled	2:11 PM	2:40 PM	12:45 PM	11:30 AM	11:05 AM	3:15 PM	1:20 PM
Semivolatile Organic Compounds (mg/kg)							
Acenaphthene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Acenaphthylene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Acetophenone	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Acetylaminofluorene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Aniline	<2.9	<3.7	<2.8	<3.2	<3.2	<3.3	<2.9
Anthracene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Benz[a]anthracene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Benzo[a]pyrene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Benzo[b]fluoranthene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Benzo[g,h,i]perylene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Benzo[k]fluoranthene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Benzyl alcohol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
bis(2-Chloroethoxy)methane	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
bis(2-Chloroethyl)ether	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
bis(2-Chloroisopropyl)ether	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
bis(2-Ethylhexyl)phthalate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
4-Bromophenyl-phenylether	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Butylbenzylphthalate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
4-Chloro-3-methylphenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Chloronaphthalene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Chlorophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
4-Chlorophenyl-phenylether	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Chrysene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Di-n-butylphthalate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Di-n-octylphthalate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Dibenz[a,h]anthracene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Dibenzofuran	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,3-Dichlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,4-Dichlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,2-Dichlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
3,3'-Dichlorobenzidine	<2.9	<3.7	<2.8	<3.2	<3.2	<3.3	<2.9
2,6-Dichlorophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2,4-Dichlorophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Diethylphthalate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
p-Dimethylaminoazobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
7,12-Dimethylbenz[a]anthracene	<2.9	<3.7	<2.8	<3.2	<3.2	<3.3	<2.9
2,4-Dimethylphenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Dimethylphthalate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
4,6-Dinitro-2-methylphenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,3-Dinitrobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2,4-Dinitrophenol	<2.9	<3.7	<2.8	<3.2	<3.2	<3.3	<2.9
2,6-Dinitrotoluene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2,4-Dinitrotoluene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Dinoseb	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Diphenylamine	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Ethyl methanesulfonate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59

Appendix Table 5. Continued.

Stream	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	WF Ohio Brush Cr.	WF Ohio Brush Cr.
River Mile	**45.1**	**40.4**	**25.0**	**15.2**	**13.2**	**12.7**	**1.1**
STORET Number	X04S22	X04G01	X04S19	X04S18	600660	X04S28	X99Q08
Date Sampled	8/13/2007	8/13/2007	8/22/2007	8/22/2007	8/22/2007	8/13/2007	8/22/2007
Time Sampled	2:11 PM	2:40 PM	12:45 PM	11:30 AM	11:05 AM	3:15 PM	1:20 PM
Semivolatile Organic Compounds (mg/kg)							
Fluoranthene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Fluorene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Hexachlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Hexachlorobutadiene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Hexachlorocyclopentadiene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Hexachloroethane	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Hexachloropropene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Indeno[1,2,3-cd]pyrene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Isophorone	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Methyl methanesulfonate	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
3-Methylcholanthrene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Methylnaphthalene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
3&4-Methylphenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Methylphenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
N-Nitroso-di-n-butylamine	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
N-Nitroso-di-n-propylamine	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
N-Nitrosomorpholine	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
N-Nitrosopiperidine	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
N-Nitrosopyrrolidine	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Naphthalene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,4-Naphthoquinone	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Nitroaniline	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
4-Nitroaniline	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Nitrobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
4-Nitrophenol	<2.9	<3.7	<2.8	<3.2	<3.2	<3.3	<2.9
2-Nitrophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Pentachlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Pentachlorophenol	<0.58 UJ	<0.73 UJ	<0.55 UJ	<0.63 UJ	<0.64 UJ	<0.66 UJ	<0.59 UJ
Phenacetin	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Phenanthrene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Phenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2-Picoline	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Pronamide	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Pyrene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Safrole	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,2,4,5-Tetrachlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2,3,4,6-Tetrachlorophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
1,2,4-Trichlorobenzene	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2,4,6-Trichlorophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
2,4,5-Trichlorophenol	<0.58	<0.73	<0.55	<0.63	<0.64	<0.66	<0.59
Volatile Organic Compounds (mg/kg)							
Acetone	<0.065	<0.072	NA	NA	NA	<0.072	NA
Benzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Bromobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Bromochloromethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
Bromodichloromethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
Bromoform	<0.052	<0.058	NA	NA	NA	<0.057	NA

Appendix Table 5. Continued.

Stream	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	Ohio Brush Creek	WF Ohio Brush Cr.	WF Ohio Brush Cr.
River Mile	45.1	40.4	25.0	15.2	13.2	12.7	1.1
STORET Number	X04S22	X04G01	X04S19	X04S18	600660	X04S28	X99Q08
Date Sampled	8/13/2007	8/13/2007	8/22/2007	8/22/2007	8/22/2007	8/13/2007	8/22/2007
Time Sampled	2:11 PM	2:40 PM	12:45 PM	11:30 AM	11:05 AM	3:15 PM	1:20 PM
Volatile Organic Compounds (mg/kg)							
Bromomethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
2-Butanone	<0.052	<0.058	NA	NA	NA	<0.057	NA
n-Butylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
sec-Butylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
tert-Butylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Carbon disulfide	<0.052	<0.058	NA	NA	NA	<0.057	NA
Carbon tetrachloride	<0.052	<0.058	NA	NA	NA	<0.057	NA
Chlorobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Chloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
Chloroform	<0.052	<0.058	NA	NA	NA	<0.057	NA
Chloromethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
2-Chlorotoluene	<0.052	<0.058	NA	NA	NA	<0.057	NA
4-Chlorotoluene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Dibromochloromethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2-Dibromo-3-chloropropane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2-Dibromoethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
Dibromomethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2-Dichlorobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,3-Dichlorobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,4-Dichlorobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Dichlorodifluoromethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1-Dichloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2-Dichloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1-Dichloroethene	<0.052	<0.058	NA	NA	NA	<0.057	NA
cis-1,2-Dichloroethene	<0.052	<0.058	NA	NA	NA	<0.057	NA
trans-1,2-Dichloroethene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2-Dichloropropane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,3-Dichloropropane	<0.052	<0.058	NA	NA	NA	<0.057	NA
2,2-Dichloropropane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1-Dichloropropene	<0.052	<0.058	NA	NA	NA	<0.057	NA
cis-1,3-Dichloropropene	<0.052	<0.058	NA	NA	NA	<0.057	NA
trans-1,3-Dichloropropene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Ethylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Hexachlorobutadiene	<0.052	<0.058	NA	NA	NA	<0.057	NA
2-Hexanone	<0.052	<0.058	NA	NA	NA	<0.057	NA
Isopropylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
4-Isopropyltoluene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Methylene chloride	<0.052	<0.058	NA	NA	NA	<0.057	NA
4-Methyl-2-pentanone	<0.052	<0.058	NA	NA	NA	<0.057	NA
Naphthalene	<0.052	<0.058	NA	NA	NA	<0.057	NA
n-Propylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Styrene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1,1,2-Tetrachloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1,2,2-Tetrachloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
Tetrachloroethene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Toluene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2,3-Trichlorobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA

Appendix Table 5. Continued.

Stream	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**Ohio Brush Creek**	**WF Ohio Brush Cr.**	**WF Ohio Brush Cr.**
River Mile	**45.1**	**40.4**	**25.0**	**15.2**	**13.2**	**12.7**	**1.1**
STORET Number	X04S22	X04G01	X04S19	X04S18	600660	X04S28	X99Q08
Date Sampled	8/13/2007	8/13/2007	8/22/2007	8/22/2007	8/22/2007	8/13/2007	8/22/2007
Time Sampled	2:11 PM	2:40 PM	12:45 PM	11:30 AM	11:05 AM	3:15 PM	1:20 PM
Volatile Organic Compounds (mg/kg)							
1,2,4-Trichlorobenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1,1-Trichloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,1,2-Trichloroethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
Trichloroethene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Trichlorofluoromethane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2,3-Trichloropropane	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,2,4-Trimethylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
1,3,5-Trimethylbenzene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Vinyl chloride	<0.052	<0.058	NA	NA	NA	<0.057	NA
o-Xylene	<0.052	<0.058	NA	NA	NA	<0.057	NA
Total m&p-xylenes	<0.052	<0.058	NA	NA	NA	<0.057	NA
Pesticides (ug/kg)							
Aldrin	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
a-BHC	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
b-BHC	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
d-BHC	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
y-BHC	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
4,4'-DDD	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
4,4'-DDE	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
4,4'-DDT	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Dieldrin	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Endosulfan I	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Endosulfan II	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Endosulfan sulfate	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Endrin	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Endrin aldehyde	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Heptachlor	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Heptachlor epoxide	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Methoxychlor	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Mirex	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
Hexachlorobenzene	<5.7	<7.4	<5.5	<6.3	<6.4	<6.6	<5.9
PCBs (ug/kg)							
PCB-1016	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2
PCB-1221	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2
PCB-1232	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2
PCB-1242	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2
PCB-1248	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2
PCB-1254	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2
PCB-1260	<28.6	<36.9	<27.5	<31.4	<32.1	<32.8	<29.2

Appendix Table 5. Continued.

Stream	**WF Ohio Brush Cr.**	**Baker Fork**	**Cherry Fork**	**Lick Fork**	**Treber Run**	**Little East Fork**
River Mile	**0.4**	**1.5**	**2.6**	**1.0**	**0.1**	**0.9**
STORET Number	X04S25	X04G02	X04P07	X04P09	X04P12	X04P04
Date Sampled	8/22/2007	8/22/2007	8/13/2007	8/14/2007	8/14/2007	8/13/2007
Time Sampled	1:35 PM	10:40 AM	4:05 PM	10:00 AM	9:30 AM	12:10 PM
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Acenaphthylene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Acetophenone	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Acetylaminofluorene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Aniline	<3.1	<5.5	<5.7	<3.3	<4.1	<3.6
Anthracene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Benz[a]anthracene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Benzo[a]pyrene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Benzo[b]fluoranthene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Benzo[g,h,i]perylene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Benzo[k]fluoranthene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Benzyl alcohol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
bis(2-Chloroethoxy)methane	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
bis(2-Chloroethyl)ether	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
bis(2-Chloroisopropyl)ether	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
bis(2-Ethylhexyl)phthalate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
4-Bromophenyl-phenylether	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Butylbenzylphthalate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
4-Chloro-3-methylphenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Chloronaphthalene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Chlorophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
4-Chlorophenyl-phenylether	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Chrysene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Di-n-butylphthalate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Di-n-octylphthalate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Dibenz[a,h]anthracene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Dibenzofuran	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,3-Dichlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,4-Dichlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,2-Dichlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
3,3'-Dichlorobenzidine	<3.1	<5.5	<5.7	<3.3	<4.1	<3.6
2,6-Dichlorophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2,4-Dichlorophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Diethylphthalate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
p-Dimethylaminoazobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
7,12-Dimethylbenz[a]anthracene	<3.1	<5.5	<5.7	<3.3	<4.1	<3.6
2,4-Dimethylphenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Dimethylphthalate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
4,6-Dinitro-2-methylphenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,3-Dinitrobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2,4-Dinitrophenol	<3.1	<5.5	<5.7	<3.3	<4.1	<3.6
2,6-Dinitrotoluene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2,4-Dinitrotoluene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Dinoseb	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Diphenylamine	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Ethyl methanesulfonate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73

Appendix Table 5. Continued.

Stream	WF Ohio Brush Cr.	Baker Fork	Cherry Fork	Lick Fork	Treber Run	Little East Fork
River Mile	0.4	1.5	2.6	1.0	0.1	0.9
STORET Number	X04S25	X04G02	X04P07	X04P09	X04P12	X04P04
Date Sampled	8/22/2007	8/22/2007	8/13/2007	8/14/2007	8/14/2007	8/13/2007
Time Sampled	1:35 PM	10:40 AM	4:05 PM	10:00 AM	9:30 AM	12:10 PM
Semivolatile Organic Compounds (mg/kg)						
Fluoranthene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Fluorene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Hexachlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Hexachlorobutadiene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Hexachlorocyclopentadiene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Hexachloroethane	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Hexachloropropene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Indeno[1,2,3-cd]pyrene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Isophorone	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Methyl methanesulfonate	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
3-Methylcholanthrene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Methylnaphthalene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
3&4-Methylphenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Methylphenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
N-Nitroso-di-n-butylamine	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
N-Nitroso-di-n-propylamine	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
N-Nitrosomorpholine	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
N-Nitrosopiperidine	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
N-Nitrosopyrrolidine	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Naphthalene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,4-Naphthoquinone	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Nitroaniline	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
4-Nitroaniline	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Nitrobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
4-Nitrophenol	<3.1	<5.5	<5.7	<3.3	<4.1	<3.6
2-Nitrophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Pentachlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Pentachlorophenol	<0.62 UJ	<1.10 UJ	<1.13 UJ	<0.66 UJ	<0.83 UJ	<0.73 UJ
Phenacetin	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Phenanthrene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Phenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2-Picoline	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Pronamide	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Pyrene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Safrole	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,2,4,5-Tetrachlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2,3,4,6-Tetrachlorophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
1,2,4-Trichlorobenzene	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2,4,6-Trichlorophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
2,4,5-Trichlorophenol	<0.62	<1.10	<1.13	<0.66	<0.83	<0.73
Volatile Organic Compounds (mg/kg)						
Acetone	NA	NA	<0.110	<0.077	<0.091	<0.072
Benzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Bromobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Bromochloromethane	NA	NA	<0.088	<0.062	<0.073	<0.058
Bromodichloromethane	NA	NA	<0.088	<0.062	<0.073	<0.058
Bromoform	NA	NA	<0.088	<0.062	<0.073	<0.058

Appendix Table 5. Continued.

Stream	WF Ohio Brush Cr.	Baker Fork	Cherry Fork	Lick Fork	Treber Run	Little East Fork
River Mile	0.4	1.5	2.6	1.0	0.1	0.9
STORET Number	X04S25	X04G02	X04P07	X04P09	X04P12	X04P04
Date Sampled	8/22/2007	8/22/2007	8/13/2007	8/14/2007	8/14/2007	8/13/2007
Time Sampled	1:35 PM	10:40 AM	4:05 PM	10:00 AM	9:30 AM	12:10 PM
Volatile Organic Compounds (mg/kg)						
Bromomethane	NA	NA	<0.088	<0.062	<0.073	<0.058
2-Butanone	NA	NA	<0.088	<0.062	<0.073	<0.058
n-Butylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
sec-Butylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
tert-Butylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Carbon disulfide	NA	NA	<0.088	<0.062	<0.073	<0.058
Carbon tetrachloride	NA	NA	<0.088	<0.062	<0.073	<0.058
Chlorobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Chloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
Chloroform	NA	NA	<0.088	<0.062	<0.073	<0.058
Chloromethane	NA	NA	<0.088	<0.062	<0.073	<0.058
2-Chlorotoluene	NA	NA	<0.088	<0.062	<0.073	<0.058
4-Chlorotoluene	NA	NA	<0.088	<0.062	<0.073	<0.058
Dibromochloromethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2-Dibromo-3-chloropropane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2-Dibromoethane	NA	NA	<0.088	<0.062	<0.073	<0.058
Dibromomethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2-Dichlorobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,3-Dichlorobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,4-Dichlorobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Dichlorodifluoromethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1-Dichloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2-Dichloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1-Dichloroethene	NA	NA	<0.088	<0.062	<0.073	<0.058
cis-1,2-Dichloroethene	NA	NA	<0.088	<0.062	<0.073	<0.058
trans-1,2-Dichloroethene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2-Dichloropropane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,3-Dichloropropane	NA	NA	<0.088	<0.062	<0.073	<0.058
2,2-Dichloropropane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1-Dichloropropene	NA	NA	<0.088	<0.062	<0.073	<0.058
cis-1,3-Dichloropropene	NA	NA	<0.088	<0.062	<0.073	<0.058
trans-1,3-Dichloropropene	NA	NA	<0.088	<0.062	<0.073	<0.058
Ethylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Hexachlorobutadiene	NA	NA	<0.088	<0.062	<0.073	<0.058
2-Hexanone	NA	NA	<0.088	<0.062	<0.073	<0.058
Isopropylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
4-Isopropyltoluene	NA	NA	<0.088	<0.062	<0.073	<0.058
Methylene chloride	NA	NA	<0.088	<0.062	<0.073	<0.058
4-Methyl-2-pentanone	NA	NA	<0.088	<0.062	<0.073	<0.058
Naphthalene	NA	NA	<0.088	<0.062	<0.073	<0.058
n-Propylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Styrene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1,1,2-Tetrachloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1,2,2-Tetrachloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
Tetrachloroethene	NA	NA	<0.088	<0.062	<0.073	<0.058
Toluene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2,3-Trichlorobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058

Appendix Table 5. Continued.

Stream	WF Ohio Brush Cr.	Baker Fork	Cherry Fork	Lick Fork	Treber Run	Little East Fork
River Mile	0.4	1.5	2.6	1.0	0.1	0.9
STORET Number	X04S25	X04G02	X04P07	X04P09	X04P12	X04P04
Date Sampled	8/22/2007	8/22/2007	8/13/2007	8/14/2007	8/14/2007	8/13/2007
Time Sampled	1:35 PM	10:40 AM	4:05 PM	10:00 AM	9:30 AM	12:10 PM
Volatile Organic Compounds (mg/kg)						
1,2,4-Trichlorobenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1,1-Trichloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,1,2-Trichloroethane	NA	NA	<0.088	<0.062	<0.073	<0.058
Trichloroethene	NA	NA	<0.088	<0.062	<0.073	<0.058
Trichlorofluoromethane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2,3-Trichloropropane	NA	NA	<0.088	<0.062	<0.073	<0.058
1,2,4-Trimethylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
1,3,5-Trimethylbenzene	NA	NA	<0.088	<0.062	<0.073	<0.058
Vinyl chloride	NA	NA	<0.088	<0.062	<0.073	<0.058
o-Xylene	NA	NA	<0.088	<0.062	<0.073	<0.058
Total m&p-xylenes	NA	NA	<0.088	<0.062	<0.073	<0.058
Pesticides (ug/kg)						
Aldrin	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
a-BHC	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
b-BHC	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
d-BHC	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
y-BHC	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
4,4'-DDD	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
4,4'-DDE	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
4,4'-DDT	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Dieldrin	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Endosulfan I	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Endosulfan II	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Endosulfan sulfate	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Endrin	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Endrin aldehyde	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Heptachlor	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Heptachlor epoxide	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Methoxychlor	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Mirex	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
Hexachlorobenzene	<6.2	<11.0	<11.3	<6.6	<8.2	<7.3
PCBs (ug/kg)						
PCB-1016	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3
PCB-1221	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3
PCB-1232	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3
PCB-1242	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3
PCB-1248	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3
PCB-1254	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3
PCB-1260	<30.8	<55.0	<56.4	<33.0	<41.2	<36.3

< - Not detected at or above the method detection limit (MDL value reported with the less than symbol).

UJ - Estimated due to failure of the reporting limit standard, or due to low spike recovery.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
Ohio Brush Creek - (10-200)																
Year: 2007																
54.70	E	07/11/2007	8.7	22(5)	9(5)	2(3)	7(5)	6(5)	9(5)	10(5)	9(5)	36(3)	42(5)	0.0(5)	1403(5)	56
Beasley Fork - (10-205)																
Year: 2007																
4.70	E	07/25/2007	3.4	14(5)	6(5)	1(1)	5(5)	2(3)	5(5)	16(5)	12(5)	8(5)	29(3)	0.0(5)	2274(5)	52
3.20	E	07/25/2007	9.7	18(5)	6(3)	2(3)	6(5)	4(5)	7(5)	18(5)	9(5)	19(5)	27(3)	0.0(5)	3696(5)	54
0.80	E	07/25/2007	18.0	22(5)	8(5)	0(1)	9(5)	4(3)	9(5)	26(5)	22(3)	23(5)	50(5)	0.0(5)	936(5)	52
Moores Run - (10-206)																
Year: 2007																
0.20	E	08/02/2007	4.0	12(5)	6(5)	2(3)	1(1)	3(5)	4(3)	19(5)	6(5)	16(5)	19(3)	0.0(5)	1786(5)	50
Cedar Run - (10-209)																
Year: 2007																
0.40	E	07/23/2007	10.7	26(5)	7(5)	1(1)	*(5)	6(5)	10(5)	20(5)	13(5)	21(5)	66(5)	0.2(5)	764(5)	56
Lick Fork - (10-211)																
Year: 2007																
4.30	E	07/25/2007	7.8	12(3)	5(3)	2(3)	0(1)	2(3)	4(3)	29(5)	17(3)	20(5)	30(3)	0.0(5)	1056(5)	42
Trebor Run - (10-212)																
Year: 2007																
0.10	D	07/19/2007	7.2	23(5)	8(5)	3(3)	8(5)	5(5)	11(5)	38(3)	23(3)	39(3)	38(3)	0.0(5)	717(5)	50
Cave Run - (10-213)																
Year: 2007																
0.10	D	07/19/2007	3.8	10(3)	4(3)	1(1)	3(3)	3(5)	3(3)	37(3)	7(5)	39(3)	55(5)	0.0(5)	152(3)	42
Trib to Lick Fk 4.02 - (10-215)																
Year: 2007																
0.20	E	07/25/2007	8.3	16(5)	6(3)	1(1)	6(5)	3(3)	6(5)	28(5)	20(3)	29(5)	41(3)	0.0(5)	1138(5)	48
Little East Fork - (10-216)																
Year: 2007																
0.90	E	07/18/2007	6.9	22(5)	9(5)	2(3)	6(5)	6(5)	10(5)	34(5)	23(3)	37(3)	38(3)	0.0(5)	591(3)	50

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
0.40	E	08/01/2007	9.9	17(5)	7(5)	1(1)	8(5)	5(5)	8(5)	30(5)	11(5)	34(3)	60(5)	0.0(5)	317(3)	52
Crooked Creek - (10-218)																
Year: 2007																
2.20	E	07/12/2007	8.3	21(5)	9(5)	3(3)	6(5)	4(5)	10(5)	37(3)	19(3)	31(3)	49(5)	0.0(5)	1040(5)	52
W. Fk. Ohio Brush Cr - (10-220)																
Year: 2007																
20.50	E	08/08/2007	4.8	14(5)	6(5)	1(1)	4(5)	5(5)	6(5)	38(3)	26(1)	46(3)	43(5)	0.0(5)	406(3)	46
17.90	E	07/06/2007	12.0	21(5)	8(5)	1(1)	9(5)	4(3)	8(5)	52(3)	44(1)	52(3)	44(3)	0.0(5)	425(3)	42
Georges Creek - (10-222)																
Year: 2007																
3.20	E	07/13/2007	5.9	13(5)	5(3)	1(1)	2(1)	3(3)	3(3)	45(3)	25(3)	38(3)	62(5)	0.0(5)	240(3)	38
0.10	E	07/23/2007	12.3	27(5)	8(5)	1(1)	*(5)	6(5)	11(5)	26(5)	21(3)	25(5)	52(5)	0.0(5)	1064(5)	54
Cherry Fork - (10-224)																
Year: 2007																
8.70	E	07/24/2007	5.7	15(5)	7(5)	1(1)	3(3)	4(5)	5(5)	54(3)	35(1)	55(3)	43(5)	0.0(5)	584(5)	46
7.50	E	07/24/2007	9.8	19(5)	7(5)	1(1)	6(5)	5(5)	8(5)	43(3)	28(3)	40(3)	59(5)	0.0(5)	801(5)	50
Grace Run - (10-225)																
Year: 2007																
1.30	E	08/07/2007	6.3	15(5)	6(5)	1(1)	3(3)	4(5)	5(3)	38(3)	27(1)	32(3)	40(5)	0.2(3)	1222(5)	42
Buck Run - (10-228)																
Year: 2007																
0.40	E	07/16/2007	10.7	23(5)	6(3)	1(1)	9(5)	7(5)	10(5)	36(3)	23(3)	34(3)	64(5)	0.0(5)	748(3)	46
Little West Fork - (10-229)																
Year: 2007																
6.30	E	08/01/2007	5.5	11(3)	4(3)	1(1)	1(1)	4(5)	4(3)	71(1)	51(1)	53(3)	17(1)	0.0(5)	330(3)	30
5.70	E	08/01/2007	9.2	17(5)	6(3)	1(1)	6(5)	5(5)	7(5)	33(5)	17(3)	32(3)	54(5)	0.0(5)	704(3)	48
Elk Fork - (10-230)																
Year: 2007																

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** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
1.60	E	07/17/2007	6.7	14(5)	4(3)	0(1)	5(5)	4(5)	7(5)	45(3)	23(3)	29(5)	29(3)	0.0(5)	430(3)	46
Elm Run - (10-233)																
Year: 2007																
1.80	E	08/08/2007	6.1	20(5)	8(5)	3(3)	7(5)	4(5)	11(5)	45(3)	28(1)	38(3)	41(5)	0.0(5)	1268(5)	50
Elk Run - (10-234)																
Year: 2007																
1.40	E	07/31/2007	5.2	24(5)	9(5)	3(3)	9(5)	5(5)	11(5)	35(3)	21(3)	33(3)	43(5)	0.0(5)	1399(5)	52
0.80	E	07/12/2007	13.9	20(5)	7(5)	1(1)	8(5)	5(5)	8(5)	33(3)	26(3)	33(3)	47(5)	0.0(5)	912(5)	50
Lost Fork - (10-237)																
Year: 2007																
2.50	E	07/12/2007	5.9	19(5)	8(5)	2(3)	7(5)	5(5)	9(5)	39(3)	22(3)	38(3)	42(5)	0.0(5)	786(5)	52
1.70	E	07/11/2007	12.2	24(5)	9(5)	2(3)	9(5)	5(5)	10(5)	29(5)	22(3)	26(5)	57(5)	0.0(5)	597(3)	54
Baker Fork - (10-240)																
Year: 2007																
14.80	E	08/01/2007	13.3	18(5)	8(5)	2(3)	5(3)	5(5)	7(5)	43(3)	21(3)	50(3)	62(5)	0.0(5)	824(5)	50
M. Fk. Baker Fork - (10-241)																
Year: 2007																
5.40	E	07/31/2007	9.8	23(5)	8(5)	2(3)	9(5)	5(5)	11(5)	18(5)	10(5)	23(5)	64(5)	0.0(5)	1130(5)	58
Strait Creek - (10-245)																
Year: 2007																
0.80	E	07/24/2007	5.9	24(5)	8(5)	3(3)	*(5)	7(5)	13(5)	28(5)	4(5)	25(5)	59(5)	0.0(5)	690(5)	58
Muddy Fk. Baker Fork - (10-246)																
Year: 2007																
0.40	E	08/01/2007	6.1	17(5)	8(5)	2(3)	5(5)	4(5)	6(5)	48(3)	19(3)	66(1)	47(5)	0.0(5)	1004(5)	50
Shimer Run - (10-248)																
Year: 2007																
0.10	E	07/18/2007	6.7	17(5)	6(5)	1(1)	7(5)	4(5)	7(5)	18(5)	5(5)	22(5)	68(5)	0.0(5)	404(3)	54
Beasley Fk trib 4.6 - (10-252)																
Year: 2007																

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* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

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Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
0.20	E	08/08/2007	4.9	13(5)	5(3)	1(1)	3(3)	3(3)	4(3)	24(5)	9(5)	20(5)	23(3)	0.0(5)	1988(5)	46

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
Ohio Brush Creek - (10200)																	
Year: 2007																	
52.50	D	07/11/2007	26	25(5)	4(5)	5(5)	2(3)	4(5)	40(5)	30(3)	27(3)	6.2(5)	65(5)	0.0(5)	515(3)	52	9.2
52.50	E	08/20/2007	26	27(5)	4(5)	4(5)	3(3)	6(5)	53(5)	20(5)	15(5)	4.4(3)	69(5)	0.1(5)	1176(5)	56	9.9
47.20	E	07/30/2007	52	24(5)	4(5)	4(5)	3(3)	6(5)	45(5)	12(5)	9(5)	6.9(5)	55(5)	0.0(5)	1038(5)	58	9.6
47.20	E	08/21/2007	52	22(5)	3(3)	4(5)	3(3)	4(3)	26(3)	35(3)	33(3)	4.9(3)	37(3)	0.0(5)	833(5)	44	8.8
44.90	E	07/30/2007	55	26(5)	4(5)	3(3)	4(3)	7(5)	40(5)	18(5)	17(5)	7.7(5)	61(5)	0.0(5)	939(5)	56	9.8
44.90	E	08/20/2007	55	27(5)	4(5)	3(3)	4(3)	7(5)	39(5)	25(5)	23(3)	7.2(5)	58(5)	0.0(5)	869(5)	54	9.8
40.40	D	07/30/2007	130	31(5)	4(5)	7(5)	5(3)	7(5)	35(3)	34(3)	32(3)	7.1(5)	56(5)	0.0(5)	578(3)	50	9.7
40.40	D	08/21/2007	130	29(5)	4(5)	5(5)	5(3)	7(5)	44(5)	27(3)	24(3)	8.8(5)	66(5)	0.2(3)	1049(5)	52	9.8
30.40	D	07/18/2007	174	33(5)	4(5)	5(5)	6(5)	7(5)	48(5)	15(5)	15(5)	7.0(5)	61(5)	0.0(5)	1677(5)	60	10.5
30.40	D	08/15/2007	174	36(5)	5(5)	6(5)	6(5)	7(5)	38(5)	18(5)	18(5)	3.6(3)	51(3)	0.0(5)	1158(5)	56	10.3
24.80	D	07/17/2007	315	31(5)	3(3)	5(5)	5(3)	7(5)	38(5)	9(5)	10(5)	2.8(3)	55(5)	0.0(5)	876(5)	54	9.6
24.80	D	08/15/2007	315	36(5)	4(5)	6(5)	7(5)	8(5)	35(3)	25(3)	25(3)	6.0(5)	46(3)	0.1(5)	1077(5)	52	9.5
21.40	D	07/12/2007	328	34(5)	4(5)	5(5)	7(5)	8(5)	50(5)	10(5)	10(5)	6.6(5)	74(5)	0.0(5)	1268(5)	60	10.6
21.40	D	08/14/2007	328	28(5)	3(3)	5(5)	5(3)	7(5)	53(5)	10(5)	10(5)	3.7(3)	74(5)	0.0(5)	1376(5)	54	10.2
15.20	D	07/12/2007	371	28(5)	2(3)	4(3)	5(3)	6(3)	53(5)	7(5)	7(5)	5.3(5)	76(5)	0.0(5)	1040(5)	52	10.6
15.20	D	08/14/2007	371	32(5)	3(3)	5(3)	6(5)	7(5)	44(5)	27(3)	27(3)	2.1(3)	58(5)	0.0(5)	1283(5)	50	10.2
10.40	D	07/12/2007	396	35(5)	3(3)	7(5)	6(5)	5(3)	40(5)	6(5)	6(5)	1.8(3)	56(5)	0.0(5)	1325(5)	54	10.3
10.40	D	08/13/2007	396	32(5)	3(3)	5(3)	7(5)	7(5)	38(5)	6(5)	6(5)	2.4(3)	62(5)	0.0(5)	867(5)	54	9.6
Lick Fork - (10211)																	
Year: 2007																	
0.70	D	07/18/2007	31	27(5)	5(5)	6(5)	4(5)	5(5)	40(5)	19(5)	18(5)	9.7(5)	69(5)	0.0(5)	300(3)	58	8.7
W. Fk. Ohio Brush Cr - (10220)																	
Year: 2007																	

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
15.20	E	07/10/2007	22	22(5)	4(5)	3(5)	1(1)	4(5)	25(3)	36(3)	29(3)	2.2(3)	62(5)	0.0(5)	1196(5)	48	9.3
15.20	E	08/07/2007	22	23(5)	4(5)	3(5)	2(3)	4(5)	27(3)	32(3)	26(3)	2.3(3)	65(5)	0.0(5)	1929(5)	50	10.0
12.70	E	07/11/2007	27	22(5)	4(5)	3(5)	1(1)	4(5)	37(5)	10(5)	6(5)	5.1(5)	65(5)	0.1(5)	983(5)	56	9.5
12.70	E	08/07/2007	27	25(5)	4(5)	3(5)	3(3)	6(5)	40(5)	23(5)	20(3)	2.8(3)	63(5)	0.0(5)	1095(5)	54	9.5
10.50	D	07/11/2007	38	30(5)	4(5)	4(5)	6(5)	6(5)	45(5)	30(3)	28(3)	1.2(3)	64(5)	0.0(5)	1454(5)	54	9.9
10.50	D	08/08/2007	38	28(5)	3(3)	5(5)	5(5)	7(5)	43(5)	37(3)	34(1)	1.4(3)	56(5)	0.0(5)	1569(5)	50	10.1
6.10	D	07/16/2007	76	28(5)	4(5)	4(5)	3(3)	7(5)	39(5)	29(3)	21(3)	9.3(5)	67(5)	0.0(5)	540(3)	52	9.6
6.10	D	08/15/2007	76	25(5)	5(5)	3(3)	4(3)	7(5)	30(3)	20(5)	4(5)	16.1(5)	70(5)	0.2(5)	746(3)	52	9.3
1.10	D	07/17/2007	129	33(5)	3(3)	6(5)	3(3)	8(5)	40(5)	17(5)	15(5)	7.0(5)	63(5)	0.0(5)	1281(5)	56	10.2
1.10	E	08/15/2007	129	28(5)	3(3)	4(3)	4(3)	7(5)	40(5)	9(5)	6(5)	6.8(5)	65(5)	0.0(5)	945(5)	54	9.5
Cherry Fork - (10224)																	
Year: 2007																	
2.60	E	07/24/2007	20	20(5)	4(5)	3(5)	1(1)	3(3)	18(3)	41(3)	39(1)	0.3(1)	40(3)	0.0(5)	1115(5)	40	8.9
2.60	D	08/14/2007	20	21(5)	4(5)	3(5)	1(1)	5(5)	16(1)	51(3)	46(1)	0.2(1)	40(3)	0.0(5)	1286(5)	40	9.0
Little West Fork - (10229)																	
Year: 2007																	
0.10	E	07/10/2007	22	24(5)	3(3)	4(5)	2(3)	7(5)	21(3)	25(5)	19(3)	0.3(1)	34(3)	0.0(5)	762(5)	46	8.0
0.10	E	08/07/2007	22	26(5)	4(5)	5(5)	4(5)	6(5)	27(3)	27(5)	22(3)	0.2(1)	45(3)	0.0(5)	1689(5)	50	9.7
Baker Fork - (10240)																	
Year: 2007																	
10.50	E	07/26/2007	21	26(5)	4(5)	4(5)	3(5)	6(5)	39(5)	23(5)	17(5)	4.0(3)	53(5)	0.0(5)	716(3)	56	9.5
10.50	E	08/16/2007	21	25(5)	4(5)	4(5)	2(3)	6(5)	33(3)	19(5)	9(5)	2.7(3)	59(5)	0.3(3)	1073(5)	52	9.7
1.50	E	07/31/2007	42	30(5)	4(5)	4(5)	5(5)	7(5)	45(5)	19(5)	18(5)	2.8(3)	65(5)	0.1(5)	1370(5)	58	10.4
1.50	E	08/21/2007	42	32(5)	3(3)	5(5)	5(5)	7(5)	52(5)	19(5)	17(5)	3.6(3)	66(5)	0.0(5)	1542(5)	56	10.3
M. Fk. Baker Fork - (10241)																	

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				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
Year: 2007																	
0.30	E	07/31/2007	20	25(5)	4(5)	4(5)	2(3)	7(5)	46(5)	23(5)	10(5)	4.6(3)	56(5)	0.0(5)	824(5)	56	9.4
0.30	E	08/20/2007	20	27(5)	4(5)	4(5)	3(5)	6(5)	53(5)	19(5)	15(5)	3.7(3)	65(5)	0.0(5)	897(5)	58	9.5

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 6. Primary fish communtiy indexes, IBI and MIwb, Ohio Brush Creek basin, 2007.

				Number of				Percent of Individuals									
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	Rel.No. minus tolerants /(1.0 km)	IBI	Modified Iwb
Ohio Brush Creek - (10-200)																	
Year: 2007																	
6.00	A	07/05/2007	423	34(5)	3(3)	9(5)	4(5)	22(3)	31(3)	4(5)	29(1)	13(5)	49(3)	0.3(5)	606(5)	48	9.7
6.00	A	08/06/2007	423	28(5)	4(5)	7(5)	3(3)	20(3)	26(3)	1(5)	8(5)	54(5)	35(3)	0.5(3)	778(5)	50	9.8
0.50	A	07/03/2007	705	16(3)	3(3)	4(3)	0(1)	2(1)	8(1)	2(5)	14(5)	43(5)	41(3)	0.0(5)	450(5)	40	7.8
0.50	A	08/06/2007	705	20(3)	3(3)	4(3)	0(1)	3(1)	8(1)	2(5)	35(1)	34(5)	27(1)	0.0(5)	446(5)	34	8.5

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

Appendix Table 7. Catch summary by station and basin, Ohio Brush Creek, 2007.

Grand Total of All Streams
Date Range: 07/03/2007
Thru: 08/21/2007

Dist Fished: 15.84 km No of Streams: 26 No of Passes: 79

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M		14	0.28	0.02	0.01	0.05	25.93
Mooneye		I	M	R	4	0.10	0.01	0.00	0.01	10.75
Skipjack Herring		P	M		176	4.45	0.33	0.01	0.08	2.96
Gizzard Shad		O	M		225	5.64	0.41	0.44	2.76	77.78
Black Buffalo	C	I	M		1	0.03	0.00	0.07	0.41	2,600.00
Smallmouth Buffalo	C	I	M		23	0.52	0.04	0.39	2.43	691.61
Quillback	C	O	M		28	0.54	0.04	0.08	0.47	143.33
River Carpsucker	C	O	M		4	0.08	0.01	0.05	0.30	692.50
Silver Redhorse	R	I	S	M	14	0.34	0.02	0.04	0.22	104.36
Black Redhorse	R	I	S	I	655	12.25	0.90	1.53	9.55	125.68
Golden Redhorse	R	I	S	M	1,417	27.69	2.04	2.27	14.15	81.58
River Redhorse [S]	R	I	S	I	2	0.05	0.00	0.00	0.03	95.00
Northern Hog Sucker	R	I	S	M	1,495	29.13	2.14	0.91	5.68	31.62
White Sucker	W	O	S	T	1,929	43.81	3.22	0.71	4.41	17.34
Spotted Sucker	R	I	S		34	0.71	0.05	0.03	0.19	45.82
Smallmouth Redhorse	R	I	S	M	154	3.13	0.23	0.17	1.07	56.71
Common Carp	G	O	M	T	35	0.70	0.05	0.06	0.37	87.85
Silver Chub	N	I	M		3	0.08	0.01	0.00	0.00	6.33
Western Blacknose Dace	N	G	S	T	199	4.53	0.33	0.02	0.14	4.80
Creek Chub	N	G	N	T	2,857	64.58	4.75	0.50	3.12	7.82
Suckermouth Minnow	N	I	S		2	0.04	0.00	0.00	0.00	3.00
South. Redbelly Dace	N	H	S		24	0.55	0.04	0.00	0.01	2.29
Emerald Shiner	N	I	M		59	1.16	0.09	0.00	0.01	1.34
Silver Shiner	N	I	S	I	1,070	20.29	1.49	0.03	0.21	1.68
Scarlet Shiner	N	I	S	M	1,235	24.86	1.83	0.04	0.27	1.75
Striped Shiner	N	I	S		7,016	140.89	10.36	0.71	4.42	5.03
Steelcolor Shiner	N	I	M	P	87	1.68	0.12	0.01	0.05	4.76
Spotfin Shiner	N	I	M		316	6.12	0.45	0.02	0.12	3.21
Sand Shiner	N	I	M	M	810	16.48	1.21	0.03	0.19	1.81
Mimic Shiner	N	I	M	I	429	8.13	0.60	0.01	0.08	1.50
Ghost Shiner	N	I	M		1	0.02	0.00	0.00	0.00	1.00
Silverjaw Minnow	N	I	M		1,901	38.95	2.86	0.07	0.41	1.66
Bullhead Minnow	N	O	C		3	0.08	0.01	0.00	0.00	2.67
Fathead Minnow	N	O	C	T	73	1.72	0.13	0.00	0.02	1.46
Bluntnose Minnow	N	O	C	T	10,750	217.42	15.98	0.48	3.00	2.22
Central Stoneroller	N	H	N		13,495	285.25	20.97	0.96	6.01	3.42
Striped Sh X Stoneroller					1	0.03	0.00	0.00	0.00	2.00
Channel Catfish	F		C		77	1.49	0.11	0.55	3.43	364.06
Yellow Bullhead		I	C	T	265	5.46	0.40	0.27	1.69	50.16
Brown Bullhead		I	C	T	2	0.04	0.00	0.00	0.02	105.00
Black Bullhead		I	C	P	1	0.02	0.00	0.00	0.02	183.00
Flathead Catfish	F	P	C		18	0.36	0.03	0.25	1.56	707.56
Stonecat Madtom		I	C	I	42	0.81	0.06	0.01	0.04	7.98
Brindled Madtom		I	C	I	63	1.19	0.09	0.01	0.03	4.17
Trout-perch		I	M		30	0.57	0.04	0.00	0.01	2.17
Brook Silverside		I	M	M	104	1.94	0.14	0.00	0.02	1.37
White Crappie	S	I	C		2	0.04	0.00	0.01	0.04	140.00

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Black Crappie	S	I	C		2	0.04	0.00	0.00	0.03	123.00
Rock Bass	S	C	C		580	11.09	0.82	0.56	3.47	50.09
Smallmouth Bass	F	C	C	M	990	19.02	1.40	1.22	7.59	64.23
Spotted Bass	F	C	C		400	8.64	0.63	0.32	2.00	39.34
Largemouth Bass	F	C	C		84	1.97	0.15	0.09	0.58	47.43
Green Sunfish	S	I	C	T	1,437	30.39	2.23	0.56	3.49	18.68
Bluegill Sunfish	S	I	C	P	534	11.01	0.81	0.17	1.03	14.21
Orangespotted Sunfish	S	I	C		1	0.02	0.00	0.00	0.00	3.00
Longear Sunfish	S	I	C	M	4,038	81.60	6.00	1.11	6.92	13.83
Pumpkinseed Sunfish	S	I	C	P	1	0.02	0.00	0.00	0.00	12.00
Green Sf X Bluegill Sf					11	0.23	0.02	0.00	0.03	18.27
Longear Sf X Bluegill Sf					1	0.02	0.00	0.00	0.00	10.00
Green Sf X Longear Sf					4	0.08	0.01	0.01	0.04	70.50
Green Sf X Hybrid					18	0.35	0.03	0.02	0.12	53.06
Sauger	F	P	S		25	0.61	0.05	0.07	0.42	113.04
Blackside Darter	D	I	S		107	2.02	0.15	0.01	0.04	3.51
Slenderhead Darter	D	I	S	R	6	0.13	0.01	0.00	0.00	2.50
Logperch	D	I	S	M	712	13.79	1.01	0.08	0.49	5.72
Johnny Darter	D	I	C		1,152	24.49	1.80	0.02	0.13	0.81
Greenside Darter	D	I	S	M	2,078	40.76	3.00	0.09	0.55	2.13
Banded Darter	D	I	S	I	225	4.28	0.31	0.01	0.04	1.34
Rainbow Darter	D	I	S	M	3,518	72.59	5.34	0.09	0.53	1.17
Orangethroat Darter	D	I	S		193	4.34	0.32	0.01	0.04	1.34
Fantail Darter	D	I	C		2,631	57.09	4.20	0.07	0.46	1.29
Sauger X Walleye	E	P			2	0.05	0.00	0.04	0.23	717.50
Freshwater Drum			M	P	65	1.49	0.11	0.76	4.73	564.29
No Fish					0	0.00	0.00			
	Grand Total				65,960	1,360.33		16.05		
	Number of Species				67					
	Number of Hybrids				6					

Species List

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **54.70**	Location: Deadfall Rd.	Date Range: 07/11/2007
Time Fished: 1500 sec	Drainage: 8.7 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	1	1.50	0.10	0.35	7.37	230.00
White Sucker	W	O	S	T	3	4.50	0.29	0.01	0.23	2.33
Creek Chub	N	G	N	T	11	16.50	1.06	0.09	1.96	5.56
South. Redbelly Dace	N	H	S		4	6.00	0.38	0.02	0.38	3.00
Scarlet Shiner	N	I	S	M	6	9.00	0.58	0.02	0.38	2.00
Striped Shiner	N	I	S		57	85.50	5.47	0.07	1.45	0.80
Spotfin Shiner	N	I	M		4	6.00	0.38	0.03	0.56	4.25
Sand Shiner	N	I	M	M	1	1.50	0.10	0.01	0.11	3.00
Silverjaw Minnow	N	I	M		251	376.50	24.09	0.21	4.38	0.54
Bluntnose Minnow	N	O	C	T	86	129.00	8.25	0.24	5.08	1.85
Central Stoneroller	N	H	N		486	729.00	46.64	0.98	20.91	1.34
Yellow Bullhead		I	C	T	4	6.00	0.38	0.42	8.97	70.00
Rock Bass	S	C	C		9	13.50	0.86	0.64	13.71	47.56
Smallmouth Bass	F	C	C	M	5	7.50	0.48	1.00	21.27	132.80
Green Sunfish	S	I	C	T	3	4.50	0.29	0.03	0.73	7.50
Longear Sunfish	S	I	C	M	19	28.50	1.82	0.33	7.11	11.67
Green Sf X Bluegill Sf					1	1.50	0.10	0.02	0.32	10.00
Longear Sf X Bluegill Sf					1	1.50	0.10	0.02	0.32	10.00
Blackside Darter	D	I	S		1	1.50	0.10	0.00	0.06	2.00
Johnny Darter	D	I	C		11	16.50	1.06	0.02	0.38	1.10
Greenside Darter	D	I	S	M	13	19.50	1.25	0.06	1.28	3.08
Rainbow Darter	D	I	S	M	40	60.00	3.84	0.09	1.86	1.45
Orangethroat Darter	D	I	S		12	18.00	1.15	0.02	0.38	1.00
Fantail Darter	D	I	C		13	19.50	1.25	0.04	0.83	2.00
	Mile Total				1,042	1,563.00		4.68		
	Number of Species				22					
	Number of Hybrids				2					

Species List

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **52.50**	Location: Peach Orchard Rd.	Date Range: 07/11/2007
Time Fished: 3203 sec	Drainage: 26.0 sq mi	Thru: 08/20/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Quillback	C	O	M		2	1.50	0.14	0.01	0.04	6.50
Black Redhorse	R	I	S	I	42	31.50	2.87	2.89	12.17	91.63
Golden Redhorse	R	I	S	M	50	37.50	3.42	7.67	32.34	204.53
Northern Hog Sucker	R	I	S	M	30	22.50	2.05	0.91	3.84	40.50
White Sucker	W	O	S	T	18	13.50	1.23	0.42	1.77	31.09
Common Carp	G	O	M	T	1	0.75	0.07	2.10	8.85	2,800.00
Creek Chub	N	G	N	T	10	7.50	0.68	0.04	0.17	5.30
Silver Shiner	N	I	S	I	51	38.25	3.49	0.07	0.28	1.72
Scarlet Shiner	N	I	S	M	74	55.50	5.06	0.13	0.53	2.27
Striped Shiner	N	I	S		341	255.75	23.32	1.16	4.90	4.54
Steelcolor Shiner	N	I	M	P	2	1.50	0.14	0.01	0.03	5.00
Spotfin Shiner	N	I	M		13	9.75	0.89	0.04	0.15	3.62
Sand Shiner	N	I	M	M	53	39.75	3.63	0.06	0.26	1.55
Silverjaw Minnow	N	I	M		27	20.25	1.85	0.04	0.15	1.74
Bluntnose Minnow	N	O	C	T	259	194.25	17.72	0.38	1.59	1.94
Central Stoneroller	N	H	N		112	84.00	7.66	0.73	3.09	8.71
Yellow Bullhead		I	C	T	16	12.00	1.09	0.76	3.18	62.88
Brook Silverside		I	M	M	11	8.25	0.75	0.01	0.04	1.18
Rock Bass	S	C	C		17	12.75	1.16	0.72	3.02	56.25
Smallmouth Bass	F	C	C	M	56	42.00	3.83	3.60	15.18	85.72
Green Sunfish	S	I	C	T	31	23.25	2.12	0.59	2.48	25.29
Bluegill Sunfish	S	I	C	P	14	10.50	0.96	0.11	0.44	10.00
Longear Sunfish	S	I	C	M	85	63.75	5.81	1.09	4.58	17.05
Blackside Darter	D	I	S		1	0.75	0.07	0.00	0.01	4.00
Logperch	D	I	S	M	8	6.00	0.55	0.08	0.33	13.13
Johnny Darter	D	I	C		16	12.00	1.09	0.01	0.05	0.94
Greenside Darter	D	I	S	M	32	24.00	2.19	0.04	0.17	1.66
Banded Darter	D	I	S	I	1	0.75	0.07	0.00	0.01	2.00
Rainbow Darter	D	I	S	M	64	48.00	4.38	0.06	0.23	1.14
Fantail Darter	D	I	C		25	18.75	1.71	0.03	0.12	1.56
	Mile Total				1,462	1,096.50		23.72		
	Number of Species				30					
	Number of Hybrids				0					

Species List

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **47.20**	Location: dst. Elk Run, adj. Sider Rd.	Date Range: 07/30/2007
Time Fished: 2524 sec	Drainage: 52.4 sq mi	Thru: 08/21/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Black Redhorse	R	I	S	I	65	48.75	3.97	4.24	28.67	86.92
Golden Redhorse	R	I	S	M	20	15.00	1.22	1.42	9.58	94.38
Northern Hog Sucker	R	I	S	M	51	38.25	3.12	1.43	9.68	37.39
White Sucker	W	O	S	T	12	9.00	0.73	0.19	1.25	20.50
Creek Chub	N	G	N	T	12	9.00	0.73	0.03	0.17	2.75
Silver Shiner	N	I	S	I	24	18.00	1.47	0.02	0.16	1.29
Scarlet Shiner	N	I	S	M	13	9.75	0.79	0.01	0.06	0.91
Striped Shiner	N	I	S		222	166.50	13.56	1.29	8.74	7.75
Sand Shiner	N	I	M	M	2	1.50	0.12	0.00	0.02	1.50
Mimic Shiner	N	I	M	I	1	0.75	0.06	0.00	0.01	2.00
Silverjaw Minnow	N	I	M		17	12.75	1.04	0.02	0.10	1.18
Bluntnose Minnow	N	O	C	T	342	256.50	20.89	0.36	2.41	1.39
Central Stoneroller	N	H	N		432	324.00	26.39	0.63	4.29	1.96
Yellow Bullhead		I	C	T	15	11.25	0.92	0.67	4.51	59.27
Rock Bass	S	C	C		30	22.50	1.83	1.41	9.52	62.50
Smallmouth Bass	F	C	C	M	66	49.50	4.03	2.23	15.07	45.00
Green Sunfish	S	I	C	T	9	6.75	0.55	0.21	1.45	31.78
Bluegill Sunfish	S	I	C	P	5	3.75	0.31	0.04	0.29	11.40
Longear Sunfish	S	I	C	M	55	41.25	3.36	0.33	2.23	8.00
Johnny Darter	D	I	C		26	19.50	1.59	0.02	0.11	0.85
Greenside Darter	D	I	S	M	109	81.75	6.66	0.16	1.06	1.90
Banded Darter	D	I	S	I	3	2.25	0.18	0.00	0.02	1.33
Rainbow Darter	D	I	S	M	60	45.00	3.67	0.04	0.24	0.79
Orangethroat Darter	D	I	S		1	0.75	0.06	0.00	0.01	1.00
Fantail Darter	D	I	C		45	33.75	2.75	0.06	0.37	1.64
Mile Total					1,637	1,227.75		14.78		
Number of Species					25					
Number of Hybrids					0					

Species List

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **44.90**	Location: adj. Twp. Rd. 113, upst. ford	Date Range: 07/30/2007
Time Fished: 3595 sec	Drainage: 55.0 sq mi	Thru: 08/20/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M		3	2.25	0.20	0.08	0.56	35.67
Black Redhorse	R	I	S	I	42	31.50	2.74	1.85	12.99	58.86
Golden Redhorse	R	I	S	M	36	27.00	2.35	0.85	5.97	31.56
Northern Hog Sucker	R	I	S	M	115	86.25	7.50	2.28	15.99	26.47
Silver Shiner	N	I	S	I	19	14.25	1.24	0.03	0.22	2.16
Scarlet Shiner	N	I	S	M	23	17.25	1.50	0.02	0.13	1.09
Striped Shiner	N	I	S		126	94.50	8.21	0.70	4.93	7.45
Spotfin Shiner	N	I	M		2	1.50	0.13	0.00	0.02	2.00
Sand Shiner	N	I	M	M	68	51.00	4.43	0.06	0.43	1.19
Silverjaw Minnow	N	I	M		9	6.75	0.59	0.01	0.06	1.33
Bluntnose Minnow	N	O	C	T	304	228.00	19.82	0.41	2.90	1.81
Central Stoneroller	N	H	N		204	153.00	13.30	0.84	5.89	5.50
Yellow Bullhead		I	C	T	6	4.50	0.39	0.36	2.51	79.67
Brindled Madtom		I	C	I	5	3.75	0.33	0.02	0.13	5.00
Rock Bass	S	C	C		47	35.25	3.06	1.73	12.10	49.01
Smallmouth Bass	F	C	C	M	61	45.75	3.98	2.37	16.58	51.74
Spotted Bass	F	C	C		3	2.25	0.20	0.02	0.15	9.33
Green Sunfish	S	I	C	T	19	14.25	1.24	0.18	1.27	12.74
Bluegill Sunfish	S	I	C	P	17	12.75	1.11	0.13	0.92	10.26
Longear Sunfish	S	I	C	M	98	73.50	6.39	1.86	12.99	25.24
Blackside Darter	D	I	S		2	1.50	0.13	0.00	0.03	2.50
Logperch	D	I	S	M	28	21.00	1.83	0.16	1.12	7.61
Johnny Darter	D	I	C		13	9.75	0.85	0.01	0.06	0.85
Greenside Darter	D	I	S	M	106	79.50	6.91	0.16	1.11	2.00
Banded Darter	D	I	S	I	4	3.00	0.26	0.01	0.05	2.25
Rainbow Darter	D	I	S	M	109	81.75	7.11	0.08	0.55	0.96
Fantail Darter	D	I	C		65	48.75	4.24	0.05	0.35	1.02
	Mile Total				1,534	1,150.50		14.28		
	Number of Species				27					
	Number of Hybrids				0					

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **40.40**	Location: St. Rt. 73	Date Range: 07/30/2007
Time Fished: 4963 sec	Drainage: 130.0 sq mi	Thru: 08/21/2007
Dist Fished: 0.44 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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		6	4.09	0.35	0.05	0.14	12.33
Quillback	C	O	M		1	0.68	0.06	0.55	1.56	800.00
River Carpsucker	C	O	M		2	1.36	0.12	1.70	4.86	1,250.00
Black Redhorse	R	I	S	I	129	87.95	7.59	12.83	36.59	145.91
Golden Redhorse	R	I	S	M	94	64.09	5.53	8.80	25.10	137.33
Northern Hog Sucker	R	I	S	M	38	25.91	2.24	0.33	0.93	12.57
Spotted Sucker	R	I	S		7	4.77	0.41	0.36	1.03	75.43
Smallmouth Redhorse	R	I	S	M	9	6.14	0.53	0.40	1.14	65.33
Silver Shiner	N	I	S	I	57	38.86	3.35	0.07	0.20	1.79
Striped Shiner	N	I	S		159	108.41	9.36	0.11	0.30	0.97
Spotfin Shiner	N	I	M		9	6.14	0.53	0.01	0.04	2.22
Sand Shiner	N	I	M	M	4	2.73	0.24	0.01	0.01	1.75
Mimic Shiner	N	I	M	I	18	12.27	1.06	0.01	0.04	1.06
Bluntnose Minnow	N	O	C	T	448	305.46	26.37	0.82	2.34	2.69
Central Stoneroller	N	H	N		41	27.95	2.41	0.06	0.17	2.15
Yellow Bullhead		I	C	T	2	1.36	0.12	0.03	0.08	20.50
Brindled Madtom		I	C	I	12	8.18	0.71	0.03	0.10	4.25
Brook Silverside		I	M	M	20	13.64	1.18	0.01	0.03	0.89
Rock Bass	S	C	C		34	23.18	2.00	0.99	2.82	42.62
Smallmouth Bass	F	C	C	M	89	60.68	5.24	2.48	7.07	40.88
Spotted Bass	F	C	C		13	8.86	0.77	1.51	4.32	170.77
Largemouth Bass	F	C	C		2	1.36	0.12	0.36	1.03	265.00
Green Sunfish	S	I	C	T	56	38.18	3.30	1.34	3.81	35.02
Bluegill Sunfish	S	I	C	P	71	48.41	4.18	0.57	1.62	11.76
Longear Sunfish	S	I	C	M	112	76.36	6.59	1.20	3.41	15.67
Green Sf X Bluegill Sf					1	0.68	0.06	0.03	0.08	42.00
Green Sf X Hybrid					4	2.73	0.24	0.08	0.22	28.00
Blackside Darter	D	I	S		15	10.23	0.88	0.02	0.05	1.67
Logperch	D	I	S	M	47	32.05	2.77	0.17	0.49	5.38
Johnny Darter	D	I	C		50	34.09	2.94	0.02	0.05	0.50
Greenside Darter	D	I	S	M	76	51.82	4.47	0.09	0.24	1.65
Banded Darter	D	I	S	I	10	6.82	0.59	0.01	0.02	1.20
Rainbow Darter	D	I	S	M	54	36.82	3.18	0.03	0.07	0.71
Fantail Darter	D	I	C		9	6.14	0.53	0.01	0.02	1.00
	Mile Total				1,699	1,158.41		35.07		
	Number of Species				32					
	Number of Hybrids				2					

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **30.40**	Location: dst. Shimer Run	Date Range: 07/18/2007
Time Fished: 5632 sec	Drainage: 174.0 sq mi	Thru: 08/15/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Black Redhorse	R	I	S	I	59	44.25	2.61	5.61	16.13	126.67
Golden Redhorse	R	I	S	M	96	72.00	4.25	7.76	22.31	107.71
Northern Hog Sucker	R	I	S	M	121	90.75	5.36	1.95	5.62	21.51
White Sucker	W	O	S	T	8	6.00	0.35	0.02	0.05	2.88
Spotted Sucker	R	I	S		1	0.75	0.04	0.45	1.29	600.00
Smallmouth Redhorse	R	I	S	M	6	4.50	0.27	0.34	0.98	75.33
Emerald Shiner	N	I	M		2	1.50	0.09	0.01	0.02	4.50
Silver Shiner	N	I	S	I	83	62.25	3.68	0.13	0.38	2.10
Scarlet Shiner	N	I	S	M	27	20.25	1.20	0.03	0.09	1.61
Striped Shiner	N	I	S		263	197.25	11.65	0.84	2.41	4.24
Steelcolor Shiner	N	I	M	P	1	0.75	0.04	0.00	0.00	2.00
Spotfin Shiner	N	I	M		12	9.00	0.53	0.01	0.04	1.63
Sand Shiner	N	I	M	M	30	22.50	1.33	0.05	0.14	2.13
Mimic Shiner	N	I	M	I	103	77.25	4.56	0.09	0.27	1.22
Silverjaw Minnow	N	I	M		12	9.00	0.53	0.02	0.05	1.96
Bluntnose Minnow	N	O	C	T	354	265.50	15.68	0.69	1.98	2.59
Central Stoneroller	N	H	N		477	357.75	21.12	1.23	3.55	3.45
Channel Catfish	F		C		1	0.75	0.04	0.94	2.70	1,250.00
Yellow Bullhead		I	C	T	1	0.75	0.04	0.00	0.00	2.00
Flathead Catfish	F	P	C		2	1.50	0.09	1.31	3.78	875.00
Stonecat Madtom		I	C	I	4	3.00	0.18	0.02	0.05	5.75
Brindled Madtom		I	C	I	7	5.25	0.31	0.02	0.05	3.57
Brook Silverside		I	M	M	12	9.00	0.53	0.02	0.06	2.42
White Crappie	S	I	C		1	0.75	0.04	0.10	0.28	130.00
Rock Bass	S	C	C		20	15.00	0.89	1.09	3.14	72.75
Smallmouth Bass	F	C	C	M	99	74.25	4.38	3.38	9.72	45.48
Spotted Bass	F	C	C		5	3.75	0.22	0.94	2.70	249.80
Green Sunfish	S	I	C	T	5	3.75	0.22	0.04	0.11	10.40
Bluegill Sunfish	S	I	C	P	5	3.75	0.22	0.05	0.13	12.20
Longear Sunfish	S	I	C	M	79	59.25	3.50	1.22	3.50	20.56
Green Sf X Longear Sf					1	0.75	0.04	0.04	0.10	47.00
Blackside Darter	D	I	S		14	10.50	0.62	0.03	0.09	3.00
Logperch	D	I	S	M	75	56.25	3.32	0.26	0.74	4.53
Johnny Darter	D	I	C		28	21.00	1.24	0.01	0.04	0.64
Greenside Darter	D	I	S	M	102	76.50	4.52	0.16	0.47	2.15
Banded Darter	D	I	S	I	28	21.00	1.24	0.04	0.12	1.89
Rainbow Darter	D	I	S	M	99	74.25	4.38	0.09	0.27	1.25
Fantail Darter	D	I	C		10	7.50	0.44	0.01	0.03	1.50
Freshwater Drum			M	P	5	3.75	0.22	5.78	16.62	1,540.00
	Mile Total				2,258	1,693.50		34.76		
	Number of Species				38					
	Number of Hybrids				1					

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **24.80**	Location: adj. Lawshe Rd., W of Jacksonville	Date Range: 07/17/2007
Time Fished: 4856 sec	Drainage: 315.0 sq mi	Thru: 08/15/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		3	2.25	0.19	0.05	0.46	23.67
Quillback	C	O	M		5	3.75	0.31	0.01	0.12	3.60
Black Redhorse	R	I	S	I	12	9.00	0.75	1.28	10.94	141.67
Golden Redhorse	R	I	S	M	110	82.50	6.88	4.13	35.41	50.00
Northern Hog Sucker	R	I	S	M	27	20.25	1.69	0.57	4.91	28.28
Spotted Sucker	R	I	S		4	3.00	0.25	0.01	0.06	2.50
Smallmouth Redhorse	R	I	S	M	9	6.75	0.56	0.22	1.91	33.00
Silver Shiner	N	I	S	I	100	75.00	6.25	0.10	0.89	1.38
Scarlet Shiner	N	I	S	M	2	1.50	0.13	0.00	0.02	1.50
Striped Shiner	N	I	S		106	79.50	6.63	0.13	1.10	1.61
Steelcolor Shiner	N	I	M	P	24	18.00	1.50	0.08	0.70	4.54
Spotfin Shiner	N	I	M		26	19.50	1.63	0.07	0.64	3.81
Sand Shiner	N	I	M	M	8	6.00	0.50	0.01	0.05	0.88
Mimic Shiner	N	I	M	I	16	12.00	1.00	0.01	0.10	1.00
Silverjaw Minnow	N	I	M		6	4.50	0.38	0.01	0.07	1.83
Bluntnose Minnow	N	O	C	T	291	218.25	18.20	0.36	3.08	1.64
Central Stoneroller	N	H	N		426	319.50	26.64	0.66	5.70	2.08
Channel Catfish	F		C		1	0.75	0.06	0.00	0.01	2.00
Flathead Catfish	F	P	C		2	1.50	0.13	0.21	1.82	141.50
Stonecat Madtom		I	C	I	6	4.50	0.38	0.01	0.10	2.67
Brindled Madtom		I	C	I	8	6.00	0.50	0.01	0.05	0.88
Brook Silverside		I	M	M	16	12.00	1.00	0.01	0.12	1.13
Rock Bass	S	C	C		19	14.25	1.19	0.47	4.03	32.95
Smallmouth Bass	F	C	C	M	12	9.00	0.75	0.81	6.99	90.42
Spotted Bass	F	C	C		37	27.75	2.31	0.50	4.33	18.16
Green Sunfish	S	I	C	T	6	4.50	0.38	0.11	0.95	24.67
Bluegill Sunfish	S	I	C	P	2	1.50	0.13	0.01	0.09	7.00
Longear Sunfish	S	I	C	M	85	63.75	5.32	0.67	5.74	10.49
Sauger	F	P	S		2	1.50	0.13	0.42	3.61	280.00
Blackside Darter	D	I	S		3	2.25	0.19	0.01	0.05	2.67
Slenderhead Darter	D	I	S	R	1	0.75	0.06	0.00	0.01	2.00
Logperch	D	I	S	M	42	31.50	2.63	0.16	1.33	4.93
Johnny Darter	D	I	C		4	3.00	0.25	0.00	0.02	0.75
Greenside Darter	D	I	S	M	81	60.75	5.07	0.11	0.97	1.85
Banded Darter	D	I	S	I	11	8.25	0.69	0.01	0.12	1.64
Rainbow Darter	D	I	S	M	68	51.00	4.25	0.08	0.68	1.54
Fantail Darter	D	I	C		17	12.75	1.06	0.02	0.15	1.41
Freshwater Drum			M	P	1	0.75	0.06	0.31	2.67	415.00
	Mile Total				1,599	1,199.25		11.65		
	Number of Species				38					
	Number of Hybrids				0					

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **21.40**	Location: Fawcett Rd.	Date Range: 07/12/2007
Time Fished: 4523 sec	Drainage: 328.0 sq mi	Thru: 08/14/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		1	0.75	0.05	0.01	0.02	8.00
Silver Redhorse	R	I	S	M	1	0.75	0.05	0.14	0.46	188.00
Black Redhorse	R	I	S	I	4	3.00	0.20	0.10	0.32	32.75
Golden Redhorse	R	I	S	M	132	99.00	6.73	4.23	13.71	42.74
Northern Hog Sucker	R	I	S	M	70	52.50	3.57	3.88	12.57	73.92
Spotted Sucker	R	I	S		7	5.25	0.36	0.03	0.09	5.29
Smallmouth Redhorse	R	I	S	M	19	14.25	0.97	1.13	3.67	79.61
Common Carp	G	O	M	T	3	2.25	0.15	0.02	0.07	10.00
Silver Shiner	N	I	S	I	140	105.00	7.14	0.14	0.46	1.35
Striped Shiner	N	I	S		352	264.00	17.95	0.94	3.04	3.55
Steelcolor Shiner	N	I	M	P	33	24.75	1.68	0.14	0.46	5.77
Spotfin Shiner	N	I	M		89	66.75	4.54	0.24	0.77	3.56
Sand Shiner	N	I	M	M	16	12.00	0.82	0.02	0.05	1.38
Mimic Shiner	N	I	M	I	134	100.50	6.83	0.20	0.66	2.01
Bluntnose Minnow	N	O	C	T	187	140.25	9.54	0.29	0.94	2.07
Central Stoneroller	N	H	N		200	150.00	10.20	0.71	2.29	4.72
Channel Catfish	F		C		10	7.50	0.51	3.96	12.82	527.78
Flathead Catfish	F	P	C		1	0.75	0.05	1.31	4.25	1,750.00
Stonecat Madtom		I	C	I	2	1.50	0.10	0.00	0.01	2.00
Brindled Madtom		I	C	I	7	5.25	0.36	0.02	0.06	3.43
Brook Silverside		I	M	M	10	7.50	0.51	0.01	0.04	1.60
Rock Bass	S	C	C		19	14.25	0.97	1.28	4.13	89.47
Smallmouth Bass	F	C	C	M	69	51.75	3.52	1.62	5.25	31.30
Spotted Bass	F	C	C		9	6.75	0.46	0.53	1.72	78.44
Largemouth Bass	F	C	C		1	0.75	0.05	0.00	0.00	2.00
Green Sunfish	S	I	C	T	9	6.75	0.46	0.09	0.30	13.59
Bluegill Sunfish	S	I	C	P	1	0.75	0.05	0.01	0.02	8.00
Longear Sunfish	S	I	C	M	107	80.25	5.46	1.84	5.95	22.89
Blackside Darter	D	I	S		4	3.00	0.20	0.01	0.02	2.50
Slenderhead Darter	D	I	S	R	2	1.50	0.10	0.00	0.01	2.50
Logperch	D	I	S	M	81	60.75	4.13	0.48	1.55	7.90
Johnny Darter	D	I	C		16	12.00	0.82	0.01	0.04	0.94
Greenside Darter	D	I	S	M	98	73.50	5.00	0.18	0.59	2.48
Banded Darter	D	I	S	I	30	22.50	1.53	0.02	0.06	0.77
Rainbow Darter	D	I	S	M	76	57.00	3.88	0.07	0.23	1.27
Fantail Darter	D	I	C		16	12.00	0.82	0.01	0.05	1.19
Freshwater Drum			M	P	5	3.75	0.25	7.20	23.32	1,920.00
	Mile Total				1,961	1,470.75		30.87		
	Number of Species				37					
	Number of Hybrids				0					

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **15.20**	Location: end of Twp. Rd. 184	Date Range: 07/12/2007
Time Fished: 4360 sec	Drainage: 371.0 sq mi	Thru: 08/14/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
River Carpsucker	C	O	M		1	0.75	0.05	0.15	0.49	200.00
Black Redhorse	R	I	S	I	22	16.50	1.14	2.29	7.50	138.59
Golden Redhorse	R	I	S	M	45	33.75	2.34	5.04	16.53	149.29
Northern Hog Sucker	R	I	S	M	144	108.00	7.49	3.01	9.88	27.88
Smallmouth Redhorse	R	I	S	M	52	39.00	2.70	2.54	8.34	65.17
Suckermouth Minnow	N	I	S		1	0.75	0.05	0.00	0.01	4.00
Emerald Shiner	N	I	M		14	10.50	0.73	0.02	0.05	1.43
Silver Shiner	N	I	S	I	133	99.75	6.92	0.11	0.35	1.07
Striped Shiner	N	I	S		143	107.25	7.44	0.43	1.40	3.96
Steelcolor Shiner	N	I	M	P	18	13.50	0.94	0.04	0.14	3.22
Spotfin Shiner	N	I	M		40	30.00	2.08	0.09	0.31	3.11
Sand Shiner	N	I	M	M	29	21.75	1.51	0.04	0.13	1.89
Mimic Shiner	N	I	M	I	33	24.75	1.72	0.03	0.09	1.15
Silverjaw Minnow	N	I	M		3	2.25	0.16	0.00	0.01	2.00
Bluntnose Minnow	N	O	C	T	374	280.50	19.45	0.50	1.63	1.77
Central Stoneroller	N	H	N		221	165.75	11.49	0.49	1.60	2.95
Channel Catfish	F		C		5	3.75	0.26	0.41	1.35	110.00
Flathead Catfish	F	P	C		4	3.00	0.21	3.25	10.67	1,083.50
Stonecat Madtom		I	C	I	15	11.25	0.78	0.06	0.21	5.60
Brindled Madtom		I	C	I	2	1.50	0.10	0.01	0.02	5.00
Brook Silverside		I	M	M	14	10.50	0.73	0.01	0.04	1.23
Rock Bass	S	C	C		15	11.25	0.78	0.91	2.99	80.93
Smallmouth Bass	F	C	C	M	35	26.25	1.82	3.31	10.85	125.91
Spotted Bass	F	C	C		11	8.25	0.57	0.51	1.68	61.91
Green Sunfish	S	I	C	T	1	0.75	0.05	0.02	0.08	32.00
Longear Sunfish	S	I	C	M	120	90.00	6.24	1.92	6.30	21.34
Blackside Darter	D	I	S		1	0.75	0.05	0.00	0.01	3.00
Logperch	D	I	S	M	62	46.50	3.22	0.18	0.58	3.82
Johnny Darter	D	I	C		6	4.50	0.31	0.00	0.01	0.67
Greenside Darter	D	I	S	M	166	124.50	8.63	0.15	0.50	1.23
Banded Darter	D	I	S	I	46	34.50	2.39	0.04	0.13	1.13
Rainbow Darter	D	I	S	M	105	78.75	5.46	0.10	0.32	1.26
Fantail Darter	D	I	C		36	27.00	1.87	0.02	0.07	0.83
Freshwater Drum			M	P	6	4.50	0.31	4.79	15.72	1,064.33
	Mile Total				1,923	1,442.25		30.48		
	Number of Species				34					
	Number of Hybrids				0					

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **10.40**	Location: upst. St. Rt. 125	Date Range: 07/12/2007
Time Fished: 4997 sec	Drainage: 396.0 sq mi	Thru: 08/13/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		2	1.50	0.13	0.02	0.07	14.00
Skipjack Herring		P	M		1	0.75	0.06	0.00	0.01	4.00
Gizzard Shad		O	M		1	0.75	0.06	0.01	0.03	12.00
Smallmouth Buffalo	C	I	M		10	7.50	0.64	1.56	5.27	207.50
Quillback	C	O	M		4	3.00	0.26	0.01	0.03	2.50
Silver Redhorse	R	I	S	M	1	0.75	0.06	0.00	0.01	4.00
Black Redhorse	R	I	S	I	3	2.25	0.19	0.80	2.71	356.00
Golden Redhorse	R	I	S	M	31	23.25	2.00	3.46	11.70	148.73
Northern Hog Sucker	R	I	S	M	38	28.50	2.45	2.55	8.64	89.57
White Sucker	W	O	S	T	4	3.00	0.26	0.01	0.03	3.00
Smallmouth Redhorse	R	I	S	M	21	15.75	1.35	0.97	3.28	61.48
Common Carp	G	O	M	T	2	1.50	0.13	0.03	0.11	21.50
Emerald Shiner	N	I	M		37	27.75	2.38	0.03	0.09	1.00
Silver Shiner	N	I	S	I	42	31.50	2.70	0.06	0.19	1.82
Striped Shiner	N	I	S		54	40.50	3.48	0.21	0.71	5.18
Steelcolor Shiner	N	I	M	P	4	3.00	0.26	0.01	0.05	4.75
Spotfin Shiner	N	I	M		63	47.25	4.06	0.13	0.46	2.84
Mimic Shiner	N	I	M	I	53	39.75	3.41	0.05	0.16	1.22
Silverjaw Minnow	N	I	M		1	0.75	0.06	0.00	0.01	2.00
Bluntnose Minnow	N	O	C	T	84	63.00	5.41	0.13	0.45	2.09
Central Stoneroller	N	H	N		456	342.00	29.36	1.53	5.19	4.49
Channel Catfish	F		C		51	38.25	3.28	11.16	37.75	291.67
Yellow Bullhead		I	C	T	1	0.75	0.06	0.03	0.08	33.00
Flathead Catfish	F	P	C		2	1.50	0.13	0.39	1.31	257.50
Stonecat Madtom		I	C	I	7	5.25	0.45	0.01	0.05	2.71
Brindled Madtom		I	C	I	5	3.75	0.32	0.01	0.03	2.40
Brook Silverside		I	M	M	3	2.25	0.19	0.00	0.02	2.00
Rock Bass	S	C	C		4	3.00	0.26	0.10	0.35	34.50
Smallmouth Bass	F	C	C	M	15	11.25	0.97	1.18	3.98	104.60
Spotted Bass	F	C	C		7	5.25	0.45	0.84	2.84	159.57
Green Sunfish	S	I	C	T	1	0.75	0.06	0.03	0.10	40.00
Bluegill Sunfish	S	I	C	P	1	0.75	0.06	0.02	0.05	21.00
Longear Sunfish	S	I	C	M	92	69.00	5.92	1.43	4.85	20.76
Sauger	F	P	S		1	0.75	0.06	0.15	0.51	200.00
Blackside Darter	D	I	S		2	1.50	0.13	0.01	0.02	3.50
Slenderhead Darter	D	I	S	R	1	0.75	0.06	0.00	0.01	5.00
Logperch	D	I	S	M	44	33.00	2.83	0.15	0.52	4.61
Greenside Darter	D	I	S	M	130	97.50	8.37	0.14	0.48	1.46
Banded Darter	D	I	S	I	61	45.75	3.93	0.05	0.17	1.10
Rainbow Darter	D	I	S	M	177	132.75	11.40	0.14	0.47	1.04
Fantail Darter	D	I	C		28	21.00	1.80	0.04	0.13	1.79
Freshwater Drum			M	P	8	6.00	0.52	2.10	7.11	350.00
	Mile Total				1,553	1,164.75		29.55		
	Number of Species				42					
	Number of Hybrids				0					

Species List

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **6.00**	Location: dst. Beasley Fork	Date Range: 07/05/2007
Time Fished: 8532 sec	Drainage: 423.0 sq mi	Thru: 08/06/2007
Dist Fished: 1.00 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		1	1.00	0.14	0.04	0.06	35.00
Mooneye		I	M	R	4	4.00	0.57	0.04	0.08	10.75
Skipjack Herring		P	M		172	172.00	24.33	0.50	0.88	2.89
Gizzard Shad		O	M		108	108.00	15.28	15.26	27.08	141.33
Smallmouth Buffalo	C	I	M		4	4.00	0.57	0.65	1.15	162.50
Quillback	C	O	M		1	1.00	0.14	0.09	0.16	90.00
River Carpsucker	C	O	M		1	1.00	0.14	0.07	0.12	70.00
Silver Redhorse	R	I	S	M	11	11.00	1.56	1.18	2.10	107.36
Golden Redhorse	R	I	S	M	87	87.00	12.31	13.15	23.33	151.15
River Redhorse [S]	R	I	S	I	2	2.00	0.28	0.19	0.34	95.00
Northern Hog Sucker	R	I	S	M	5	5.00	0.71	0.19	0.33	37.20
Spotted Sucker	R	I	S		11	11.00	1.56	0.03	0.05	2.64
Smallmouth Redhorse	R	I	S	M	30	30.00	4.24	0.97	1.73	32.47
Silver Chub	N	I	M		1	1.00	0.14	0.00	0.00	2.00
Emerald Shiner	N	I	M		6	6.00	0.85	0.01	0.02	2.17
Silver Shiner	N	I	S	I	1	1.00	0.14	0.00	0.00	2.00
Steelcolor Shiner	N	I	M	P	4	4.00	0.57	0.02	0.04	6.00
Spotfin Shiner	N	I	M		20	20.00	2.83	0.07	0.12	3.50
Bullhead Minnow	N	O	C		3	3.00	0.42	0.01	0.01	2.67
Bluntnose Minnow	N	O	C	T	10	10.00	1.41	0.01	0.02	1.40
Channel Catfish	F		C		5	5.00	0.71	2.94	5.21	587.80
Flathead Catfish	F	P	C		2	2.00	0.28	0.63	1.12	314.50
White Crappie	S	I	C		1	1.00	0.14	0.15	0.27	150.00
Smallmouth Bass	F	C	C	M	1	1.00	0.14	0.11	0.19	108.00
Spotted Bass	F	C	C		43	43.00	6.08	2.73	4.84	63.47
Largemouth Bass	F	C	C		13	13.00	1.84	1.63	2.90	125.69
Green Sunfish	S	I	C	T	5	5.00	0.71	0.25	0.45	50.20
Bluegill Sunfish	S	I	C	P	13	13.00	1.84	1.01	1.80	77.92
Longear Sunfish	S	I	C	M	52	52.00	7.36	1.34	2.37	25.71
Sauger	F	P	S		20	20.00	2.83	1.88	3.34	94.15
Slenderhead Darter	D	I	S	R	2	2.00	0.28	0.00	0.01	1.50
Logperch	D	I	S	M	26	26.00	3.68	0.09	0.16	3.50
Johnny Darter	D	I	C		1	1.00	0.14	0.00	0.00	1.00
Greenside Darter	D	I	S	M	2	2.00	0.28	0.00	0.01	2.00
Rainbow Darter	D	I	S	M	3	3.00	0.42	0.00	0.01	1.33
Sauger X Walleye	E	P			2	2.00	0.28	1.44	2.55	717.50
Freshwater Drum			M	P	34	34.00	4.81	9.66	17.14	284.24
	Mile Total				707	707.00		56.37		
	Number of Species				36					
	Number of Hybrids				1					

Species List

River Code: **10-200**	Stream: **Ohio Brush Creek**	Sample Date: **2007**
River Mile: **0.50**	Location: upst. St. Rt. 32	Date Range: 07/03/2007
Time Fished: 5553 sec	Drainage: 435.0 sq mi	Thru: 08/06/2007
Dist Fished: 1.00 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		1	1.00	0.22	0.04	0.14	35.00
Skipjack Herring		P	M		3	3.00	0.66	0.02	0.08	6.67
Gizzard Shad		O	M		109	109.00	23.85	2.15	8.85	19.70
Black Buffalo	C	I	M		1	1.00	0.22	2.60	10.71	2,600.00
Smallmouth Buffalo	C	I	M		9	9.00	1.97	13.18	54.30	1,464.67
Golden Redhorse	R	I	S	M	4	4.00	0.88	0.55	2.25	136.50
Spotted Sucker	R	I	S		1	1.00	0.22	0.28	1.14	276.00
Smallmouth Redhorse	R	I	S	M	5	5.00	1.09	0.12	0.49	23.80
Common Carp	G	O	M	T	1	1.00	0.22	0.01	0.05	13.00
Silver Chub	N	I	M		2	2.00	0.44	0.02	0.07	8.50
Spotfin Shiner	N	I	M		2	2.00	0.44	0.00	0.02	2.00
Bluntnose Minnow	N	O	C	T	1	1.00	0.22	0.00	0.02	4.00
Central Stoneroller	N	H	N		8	8.00	1.75	0.04	0.18	5.38
Flathead Catfish	F	P	C		1	1.00	0.22	0.60	2.47	600.00
Spotted Bass	F	C	C		122	122.00	26.70	0.82	3.38	6.73
Largemouth Bass	F	C	C		47	47.00	10.28	1.29	5.33	27.54
Green Sunfish	S	I	C	T	7	7.00	1.53	0.25	1.04	36.14
Bluegill Sunfish	S	I	C	P	23	23.00	5.03	1.54	6.35	67.04
Longear Sunfish	S	I	C	M	76	76.00	16.63	0.38	1.56	5.00
Green Sf X Bluegill Sf					1	1.00	0.22	0.00	0.02	4.00
Sauger	F	P	S		2	2.00	0.44	0.18	0.75	91.50
Logperch	D	I	S	M	23	23.00	5.03	0.07	0.30	3.17
Greenside Darter	D	I	S	M	1	1.00	0.22	0.00	0.01	3.00
Rainbow Darter	D	I	S	M	1	1.00	0.22	0.00	0.01	2.00
Freshwater Drum			M	P	6	6.00	1.31	0.11	0.47	19.00
	Mile Total				457	457.00		24.28		
	Number of Species				24					
	Number of Hybrids				1					

Species List

River Code: **10-205**	Stream: **Beasley Fork**	Sample Date: **2007**
River Mile: **4.70**	Location: adj. St. Rt. 247, dst. trib.	Date Range: 07/25/2007
Time Fished: 1802 sec	Drainage: 3.4 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	2	4.00	0.15	0.60	5.10	150.00
White Sucker	W	O	S	T	116	232.00	8.53	2.00	16.99	8.62
Creek Chub	N	G	N	T	54	108.00	3.97	1.12	9.52	10.38
Scarlet Shiner	N	I	S	M	1	2.00	0.07	0.00	0.03	2.00
Striped Shiner	N	I	S		69	138.00	5.07	1.26	10.70	9.13
Silverjaw Minnow	N	I	M		10	20.00	0.74	0.02	0.20	1.20
Bluntnose Minnow	N	O	C	T	42	84.00	3.09	0.14	1.22	1.71
Central Stoneroller	N	H	N		747	1,494.00	54.93	3.97	33.73	2.66
Yellow Bullhead		I	C	T	3	6.00	0.22	0.24	2.00	39.33
Smallmouth Bass	F	C	C	M	1	2.00	0.07	0.30	2.55	150.00
Green Sunfish	S	I	C	T	8	16.00	0.59	0.42	3.57	26.25
Longear Sunfish	S	I	C	M	14	28.00	1.03	0.85	7.22	30.36
Rainbow Darter	D	I	S	M	173	346.00	12.72	0.48	4.08	1.39
Fantail Darter	D	I	C		120	240.00	8.82	0.36	3.08	1.51
	Mile Total				1,360	2,720.00		11.77		
	Number of Species				14					
	Number of Hybrids				0					

River Code: **10-205**	Stream: **Beasley Fork**	Sample Date: **2007**
River Mile: **3.20**	Location:	Date Range: 07/25/2007
Time Fished: 1697 sec	Drainage: 9.7 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	1	1.50	0.03	0.00	0.02	2.00
Northern Hog Sucker	R	I	S	M	9	13.50	0.30	0.09	0.53	6.67
White Sucker	W	O	S	T	31	46.50	1.03	0.33	1.94	7.03
Western Blacknose Dace	N	G	S	T	24	36.00	0.80	0.11	0.65	3.04
Creek Chub	N	G	N	T	230	345.00	7.64	2.34	13.82	6.77
Striped Shiner	N	I	S		382	573.00	12.68	1.12	6.63	1.95
Silverjaw Minnow	N	I	M		80	120.00	2.66	0.28	1.67	2.35
Bluntnose Minnow	N	O	C	T	243	364.50	8.07	1.02	6.05	2.81
Central Stoneroller	N	H	N		1,676	2,514.00	55.64	9.41	55.67	3.74
Yellow Bullhead		I	C	T	16	24.00	0.53	0.16	0.94	6.56
Smallmouth Bass	F	C	C	M	5	7.50	0.17	0.24	1.42	32.00
Green Sunfish	S	I	C	T	4	6.00	0.13	0.30	1.78	50.00
Bluegill Sunfish	S	I	C	P	2	3.00	0.07	0.01	0.07	4.00
Longear Sunfish	S	I	C	M	35	52.50	1.16	0.70	4.11	13.24
Johnny Darter	D	I	C		1	1.50	0.03	0.00	0.02	2.00
Greenside Darter	D	I	S	M	17	25.50	0.56	0.09	0.51	3.35
Rainbow Darter	D	I	S	M	234	351.00	7.77	0.63	3.75	1.81
Fantail Darter	D	I	C		22	33.00	0.73	0.08	0.44	2.27
	Mile Total				3,012	4,518.00		16.90		
	Number of Species				18					
	Number of Hybrids				0					

River Code: **10-205**	Stream: **Beasley Fork**	Sample Date: **2007**
River Mile: **0.80**	Location: ford near mouth	Date Range: 07/25/2007
Time Fished: 2926 sec	Drainage: 18.0 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Quillback	C	O	M		1	1.50	0.12	0.40	4.73	264.00
Golden Redhorse	R	I	S	M	4	6.00	0.48	0.34	4.03	56.25
Northern Hog Sucker	R	I	S	M	9	13.50	1.07	0.68	8.06	50.00
White Sucker	W	O	S	T	16	24.00	1.90	0.07	0.85	2.94
Creek Chub	N	G	N	T	15	22.50	1.78	0.14	1.61	6.00
Suckermouth Minnow	N	I	S		1	1.50	0.12	0.00	0.04	2.00
Scarlet Shiner	N	I	S	M	3	4.50	0.36	0.01	0.10	1.67
Striped Shiner	N	I	S		187	280.50	22.24	0.45	5.32	1.59
Mimic Shiner	N	I	M	I	1	1.50	0.12	0.00	0.04	2.00
Silverjaw Minnow	N	I	M		10	15.00	1.19	0.02	0.20	1.10
Bluntnose Minnow	N	O	C	T	164	246.00	19.50	0.46	5.50	1.87
Central Stoneroller	N	H	N		163	244.50	19.38	0.45	5.38	1.84
Channel Catfish	F		C		1	1.50	0.12	0.10	1.24	69.00
Yellow Bullhead		I	C	T	16	24.00	1.90	0.75	8.95	31.25
Smallmouth Bass	F	C	C	M	11	16.50	1.31	2.01	23.99	121.82
Spotted Bass	F	C	C		49	73.50	5.83	0.23	2.71	3.08
Green Sunfish	S	I	C	T	6	9.00	0.71	0.12	1.43	13.33
Longear Sunfish	S	I	C	M	78	117.00	9.27	1.85	22.05	15.79
Green Sf X Bluegill Sf					1	1.50	0.12	0.02	0.25	14.00
Logperch	D	I	S	M	28	42.00	3.33	0.18	2.11	4.21
Johnny Darter	D	I	C		1	1.50	0.12	0.00	0.02	1.00
Greenside Darter	D	I	S	M	5	7.50	0.59	0.01	0.10	1.00
Rainbow Darter	D	I	S	M	71	106.50	8.44	0.11	1.35	1.06
	Mile Total				841	1,261.50		8.38		
	Number of Species				22					
	Number of Hybrids				1					

River Code: **10-206**	Stream: **Moore Run**	Sample Date: **2007**
River Mile: **0.20**	Location: St. Rt. 247	Date Range: 08/02/2007
Time Fished: 1053 sec	Drainage: 4.0 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	18	36.00	1.64	0.16	3.59	4.35
Western Blacknose Dace	N	G	S	T	29	58.00	2.64	0.12	2.70	2.03
Creek Chub	N	G	N	T	111	222.00	10.09	1.13	25.87	5.09
Striped Shiner	N	I	S		50	100.00	4.55	0.28	6.31	2.76
Silverjaw Minnow	N	I	M		16	32.00	1.45	0.05	1.14	1.56
Bluntnose Minnow	N	O	C	T	44	88.00	4.00	0.10	2.31	1.15
Central Stoneroller	N	H	N		688	1,376.00	62.55	2.20	50.23	1.60
Yellow Bullhead		I	C	T	1	2.00	0.09	0.00	0.09	2.00
Green Sunfish	S	I	C	T	4	8.00	0.36	0.08	1.78	9.75
Johnny Darter	D	I	C		1	2.00	0.09	0.00	0.09	2.00
Rainbow Darter	D	I	S	M	97	194.00	8.82	0.17	3.89	0.88
Fantail Darter	D	I	C		41	82.00	3.73	0.09	2.01	1.07
	Mile Total				1,100	2,200.00		4.37		
	Number of Species				12					
	Number of Hybrids				0					

River Code: **10-209**	Stream: **Cedar Run**	Sample Date: **2007**
River Mile: **0.40**	Location: Gustin Rd.	Date Range: 07/23/2007
Time Fished: 2418 sec	Drainage: 10.7 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Gizzard Shad		O	M		1	1.50	0.16	0.01	0.04	3.00
Black Redhorse	R	I	S	I	23	34.50	3.63	1.41	12.10	40.78
Golden Redhorse	R	I	S	M	15	22.50	2.37	0.49	4.17	21.54
Northern Hog Sucker	R	I	S	M	10	15.00	1.58	1.00	8.60	66.67
White Sucker	W	O	S	T	1	1.50	0.16	0.02	0.17	13.00
Creek Chub	N	G	N	T	20	30.00	3.15	0.39	3.33	12.90
Scarlet Shiner	N	I	S	M	47	70.50	7.41	0.11	0.93	1.53
Striped Shiner	N	I	S		147	220.50	23.19	1.39	11.94	6.29
Spotfin Shiner	N	I	M		4	6.00	0.63	0.02	0.13	2.50
Mimic Shiner	N	I	M	I	1	1.50	0.16	0.00	0.03	2.00
Bluntnose Minnow	N	O	C	T	80	120.00	12.62	0.36	3.07	2.97
Central Stoneroller	N	H	N		64	96.00	10.09	0.47	4.00	4.84
Stonecat Madtom		I	C	I	1	1.50	0.16	0.02	0.15	12.00
Rock Bass	S	C	C		15	22.50	2.37	1.69	14.52	75.00
Smallmouth Bass	F	C	C	M	20	30.00	3.15	1.65	14.19	55.00
Spotted Bass	F	C	C		13	19.50	2.05	0.25	2.11	12.54
Green Sunfish	S	I	C	T	24	36.00	3.79	0.66	5.68	18.33
Bluegill Sunfish	S	I	C	P	1	1.50	0.16	0.02	0.13	10.00
Longear Sunfish	S	I	C	M	75	112.50	11.83	1.29	11.12	11.49
Pumpkinseed Sunfish	S	I	C	P	1	1.50	0.16	0.02	0.15	12.00
Green Sf X Hybrid					5	7.50	0.79	0.18	1.57	24.40
Blackside Darter	D	I	S		5	7.50	0.79	0.03	0.22	3.40
Logperch	D	I	S	M	10	15.00	1.58	0.09	0.74	5.70
Johnny Darter	D	I	C		9	13.50	1.42	0.02	0.15	1.33
Greenside Darter	D	I	S	M	10	15.00	1.58	0.04	0.31	2.40
Rainbow Darter	D	I	S	M	25	37.50	3.94	0.04	0.36	1.12
Fantail Darter	D	I	C		7	10.50	1.10	0.01	0.10	1.14
	Mile Total				634	951.00		11.63		
	Number of Species				26					
	Number of Hybrids				1					

River Code: **10-211**	Stream: **Lick Fork**	Sample Date: **2007**
River Mile: **4.30**	Location: upst. unnamed trib.	Date Range: 07/25/2007
Time Fished:	Drainage: 7.8 sq mi	
Dist Fished: 0.16 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	33	61.88	4.14	1.29	12.15	20.83
Spotted Sucker	R	I	S		1	1.88	0.13	0.14	1.27	72.00
Western Blacknose Dace	N	G	S	T	33	61.88	4.14	1.13	10.60	18.18
Creek Chub	N	G	N	T	3	5.63	0.38	0.10	0.93	17.67
Striped Shiner	N	I	S		22	41.25	2.76	0.48	4.50	11.59
Bluntnose Minnow	N	O	C	T	105	196.88	13.16	0.32	3.02	1.63
Central Stoneroller	N	H	N		389	729.38	48.75	1.58	14.93	2.17
Yellow Bullhead		I	C	T	15	28.13	1.88	2.44	22.97	86.67
Green Sunfish	S	I	C	T	46	86.25	5.76	2.25	21.22	26.11
Bluegill Sunfish	S	I	C	P	25	46.88	3.13	0.65	6.13	13.88
Johnny Darter	D	I	C		5	9.38	0.63	0.01	0.08	0.80
Fantail Darter	D	I	C		121	226.88	15.16	0.23	2.20	1.03
	Mile Total				798	1,496.25		10.61		
	Number of Species				12					
	Number of Hybrids				0					

River Code: **10-211**	Stream: **Lick Fork**	Sample Date: **2007**
River Mile: **0.70**	Location: near mouth	Date Range: 07/18/2007
Time Fished: 1791 sec	Drainage: 31.3 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Quillback	C	O	M		2	3.00	0.81	1.13	8.34	375.00
Silver Redhorse	R	I	S	M	1	1.50	0.40	0.13	0.98	88.00
Black Redhorse	R	I	S	I	3	4.50	1.21	0.22	1.65	49.33
Golden Redhorse	R	I	S	M	19	28.50	7.66	3.75	27.79	131.58
Northern Hog Sucker	R	I	S	M	2	3.00	0.81	0.04	0.29	13.00
Smallmouth Redhorse	R	I	S	M	1	1.50	0.40	0.02	0.11	10.00
Creek Chub	N	G	N	T	1	1.50	0.40	0.01	0.06	5.00
Silver Shiner	N	I	S	I	6	9.00	2.42	0.02	0.17	2.60
Striped Shiner	N	I	S		50	75.00	20.16	0.06	0.44	0.80
Spotfin Shiner	N	I	M		4	6.00	1.61	0.04	0.28	6.25
Mimic Shiner	N	I	M	I	3	4.50	1.21	0.01	0.04	1.00
Bluntnose Minnow	N	O	C	T	43	64.50	17.34	0.11	0.80	1.67
Central Stoneroller	N	H	N		5	7.50	2.02	0.02	0.11	2.00
Channel Catfish	F		C		2	3.00	0.81	4.13	30.57	1,375.00
Brindled Madtom		I	C	I	1	1.50	0.40	0.01	0.04	4.00
Black Crappie	S	I	C		1	1.50	0.40	0.17	1.22	110.00
Rock Bass	S	C	C		6	9.00	2.42	0.19	1.40	21.00
Smallmouth Bass	F	C	C	M	10	15.00	4.03	0.75	5.56	50.00
Spotted Bass	F	C	C		8	12.00	3.23	1.88	13.90	156.25
Green Sunfish	S	I	C	T	4	6.00	1.61	0.10	0.77	17.25
Bluegill Sunfish	S	I	C	P	6	9.00	2.42	0.19	1.42	21.33
Longear Sunfish	S	I	C	M	41	61.50	16.53	0.46	3.42	7.49
Green Sf X Bluegill Sf					1	1.50	0.40	0.01	0.09	8.00
Logperch	D	I	S	M	3	4.50	1.21	0.02	0.16	4.67
Johnny Darter	D	I	C		5	7.50	2.02	0.01	0.04	0.80
Greenside Darter	D	I	S	M	6	9.00	2.42	0.02	0.17	2.50
Rainbow Darter	D	I	S	M	7	10.50	2.82	0.01	0.10	1.33
Fantail Darter	D	I	C		7	10.50	2.82	0.01	0.09	1.14
	Mile Total				248	372.00		13.49		
	Number of Species				27					
	Number of Hybrids				1					

River Code: **10-212**	Stream: **Treber Run**	Sample Date: **2007**
River Mile: **0.10**	Location: St. Rt. 41	Date Range: 07/19/2007
Time Fished: 1872 sec	Drainage: 7.2 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Black Redhorse	R	I	S	I	3	4.50	0.39	0.11	1.46	25.33
Golden Redhorse	R	I	S	M	10	15.00	1.30	0.15	1.91	9.90
Northern Hog Sucker	R	I	S	M	22	33.00	2.86	0.21	2.65	6.27
White Sucker	W	O	S	T	15	22.50	1.95	0.17	2.12	7.33
Western Blacknose Dace	N	G	S	T	9	13.50	1.17	0.02	0.22	1.22
Creek Chub	N	G	N	T	88	132.00	11.46	2.17	27.84	16.46
South. Redbelly Dace	N	H	S		1	1.50	0.13	0.00	0.04	2.00
Scarlet Shiner	N	I	S	M	18	27.00	2.34	0.04	0.53	1.50
Striped Shiner	N	I	S		78	117.00	10.16	0.39	5.04	3.36
Silverjaw Minnow	N	I	M		20	30.00	2.60	0.06	0.73	1.89
Bluntnose Minnow	N	O	C	T	164	246.00	21.35	0.58	7.37	2.34
Central Stoneroller	N	H	N		197	295.50	25.65	1.10	14.05	3.71
Brown Bullhead		I	C	T	2	3.00	0.26	0.32	4.04	105.00
Black Bullhead		I	C	P	1	1.50	0.13	0.28	3.53	183.00
Rock Bass	S	C	C		1	1.50	0.13	0.14	1.73	90.00
Smallmouth Bass	F	C	C	M	3	4.50	0.39	0.33	4.23	73.33
Green Sunfish	S	I	C	T	12	18.00	1.56	0.75	9.61	41.67
Longear Sunfish	S	I	C	M	38	57.00	4.95	0.85	10.86	14.86
Blackside Darter	D	I	S		1	1.50	0.13	0.01	0.18	9.00
Johnny Darter	D	I	C		13	19.50	1.69	0.01	0.18	0.69
Greenside Darter	D	I	S	M	3	4.50	0.39	0.02	0.22	3.67
Rainbow Darter	D	I	S	M	25	37.50	3.26	0.05	0.58	1.21
Fantail Darter	D	I	C		44	66.00	5.73	0.07	0.95	1.12
	Mile Total				768	1,152.00		7.80		
	Number of Species				23					
	Number of Hybrids				0					

River Code: **10-213**	Stream: **Cave Run**	Sample Date: **2007**
River Mile: **0.10**	Location: at mouth, adj. lane	Date Range: 07/19/2007
Time Fished: 1086 sec	Drainage: 3.8 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	24	48.00	19.83	0.14	12.26	3.00
Creek Chub	N	G	N	T	30	60.00	24.79	0.14	12.17	2.38
Striped Shiner	N	I	S		4	8.00	3.31	0.12	10.38	15.25
Bluntnose Minnow	N	O	C	T	9	18.00	7.44	0.04	3.06	2.00
Central Stoneroller	N	H	N		16	32.00	13.22	0.14	12.26	4.50
Green Sunfish	S	I	C	T	6	12.00	4.96	0.38	32.68	32.00
Longear Sunfish	S	I	C	M	4	8.00	3.31	0.09	7.49	11.00
Johnny Darter	D	I	C		2	4.00	1.65	0.01	0.51	1.50
Rainbow Darter	D	I	S	M	3	6.00	2.48	0.01	1.02	2.00
Fantail Darter	D	I	C		23	46.00	19.01	0.10	8.17	2.09
	Mile Total				121	242.00		1.18		
	Number of Species				10					
	Number of Hybrids				0					

River Code: **10-215**	Stream: **Trib. to Lick Fork (RM 4.02)**	Sample Date: **2007**
River Mile: **2.80**	Location: at farm lane	Date Range: 08/16/2007
Time Fished: 628 sec	Drainage: 2.7 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
No Fish					0	0.00	0			
	Mile Total				0					
	Number of Species				0					
	Number of Hybrids				0					

River Code: **10-215**	Stream: **Trib. to Lick Fork (RM 4.02)**	Sample Date: **2007**
River Mile: **0.20**	Location: St. Rt. 41	Date Range: 07/25/2007
Time Fished: 1251 sec	Drainage: 8.3 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	1	2.00	0.13	0.02	0.23	8.00
Northern Hog Sucker	R	I	S	M	2	4.00	0.25	0.01	0.12	2.00
White Sucker	W	O	S	T	10	20.00	1.26	0.13	1.85	6.30
Creek Chub	N	G	N	T	31	62.00	3.90	0.30	4.46	4.90
Scarlet Shiner	N	I	S	M	11	22.00	1.39	0.02	0.32	1.00
Striped Shiner	N	I	S		89	178.00	11.21	0.92	13.45	5.15
Silverjaw Minnow	N	I	M		7	14.00	0.88	0.04	0.53	2.57
Bluntnose Minnow	N	O	C	T	151	302.00	19.02	0.42	6.16	1.39
Central Stoneroller	N	H	N		275	550.00	34.63	1.87	27.45	3.40
Smallmouth Bass	F	C	C	M	2	4.00	0.25	0.30	4.43	75.50
Green Sunfish	S	I	C	T	33	66.00	4.16	1.19	17.39	17.97
Bluegill Sunfish	S	I	C	P	7	14.00	0.88	0.11	1.64	8.00
Longear Sunfish	S	I	C	M	89	178.00	11.21	1.30	19.06	7.30
Green Sf X Hybrid					1	2.00	0.13	0.03	0.38	13.00
Johnny Darter	D	I	C		8	16.00	1.01	0.02	0.23	1.00
Rainbow Darter	D	I	S	M	18	36.00	2.27	0.03	0.50	0.94
Fantail Darter	D	I	C		59	118.00	7.43	0.12	1.79	1.03
	Mile Total				794	1,588.00		6.82		
	Number of Species				16					
	Number of Hybrids				1					

River Code: **10-216**	Stream: **Little East Fork**	Sample Date: **2007**
River Mile: **0.90**	Location: old St. Rt. 32	Date Range: 07/18/2007
Time Fished: 1838 sec	Drainage: 6.9 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	1	1.50	0.17	0.02	0.47	10.00
Northern Hog Sucker	R	I	S	M	11	16.50	1.85	0.22	6.72	13.09
White Sucker	W	O	S	T	1	1.50	0.17	0.04	1.09	23.00
Creek Chub	N	G	N	T	57	85.50	9.56	0.49	15.24	5.73
South. Redbelly Dace	N	H	S		1	1.50	0.17	0.00	0.09	2.00
Scarlet Shiner	N	I	S	M	11	16.50	1.85	0.06	1.87	3.64
Striped Shiner	N	I	S		71	106.50	11.91	0.34	10.48	3.16
Spotfin Shiner	N	I	M		1	1.50	0.17	0.01	0.16	3.00
Silverjaw Minnow	N	I	M		6	9.00	1.01	0.02	0.62	2.17
Fathead Minnow	N	O	C	T	1	1.50	0.17	0.00	0.09	2.00
Bluntnose Minnow	N	O	C	T	136	204.00	22.82	0.35	10.89	1.71
Central Stoneroller	N	H	N		165	247.50	27.68	0.63	19.60	2.55
Rock Bass	S	C	C		4	6.00	0.67	0.22	6.87	36.75
Smallmouth Bass	F	C	C	M	6	9.00	1.01	0.26	8.12	29.00
Green Sunfish	S	I	C	T	7	10.50	1.17	0.36	11.10	34.00
Bluegill Sunfish	S	I	C	P	2	3.00	0.34	0.02	0.56	6.00
Blackside Darter	D	I	S		1	1.50	0.17	0.01	0.28	6.00
Johnny Darter	D	I	C		10	15.00	1.68	0.02	0.47	1.00
Greenside Darter	D	I	S	M	7	10.50	1.17	0.03	1.00	3.00
Rainbow Darter	D	I	S	M	35	52.50	5.87	0.04	1.21	0.74
Orangethroat Darter	D	I	S		1	1.50	0.17	0.00	0.06	1.00
Fantail Darter	D	I	C		61	91.50	10.23	0.10	3.14	1.10
	Mile Total				596	894.00		3.22		
	Number of Species				22					
	Number of Hybrids				0					

River Code: **10-216**	Stream: **Little East Fork**	Sample Date: **2007**
River Mile: **0.40**	Location: near mouth	Date Range: 08/01/2007
Time Fished: 1294 sec	Drainage: 9.9 sq mi	
Dist Fished: 0.18 km	Basin: Southwest Ohio River Tribs No of Passes: 1	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	9	15.00	3.31	0.20	10.87	13.11
White Sucker	W	O	S	T	1	1.67	0.37	0.00	0.17	2.00
Creek Chub	N	G	N	T	51	85.00	18.75	0.51	28.04	5.98
Silver Shiner	N	I	S	I	1	1.67	0.37	0.00	0.17	2.00
Scarlet Shiner	N	I	S	M	4	6.67	1.47	0.02	0.94	2.50
Striped Shiner	N	I	S		65	108.33	23.90	0.65	35.71	5.97
Silverjaw Minnow	N	I	M		3	5.00	1.10	0.01	0.44	1.67
Bluntnose Minnow	N	O	C	T	30	50.00	11.03	0.09	5.08	1.83
Central Stoneroller	N	H	N		19	31.67	6.99	0.11	5.96	3.42
Smallmouth Bass	F	C	C	M	8	13.33	2.94	0.03	1.66	2.25
Green Sunfish	S	I	C	T	5	8.33	1.84	0.08	4.30	9.40
Bluegill Sunfish	S	I	C	P	1	1.67	0.37	0.01	0.39	4.00
Longear Sunfish	S	I	C	M	1	1.67	0.37	0.01	0.28	3.00
Logperch	D	I	S	M	1	1.67	0.37	0.00	0.17	2.00
Johnny Darter	D	I	C		9	15.00	3.31	0.01	0.66	0.78
Greenside Darter	D	I	S	M	4	6.67	1.47	0.01	0.55	1.50
Rainbow Darter	D	I	S	M	41	68.33	15.07	0.06	3.20	0.85
Fantail Darter	D	I	C		19	31.67	6.99	0.03	1.38	0.79
	Mile Total				272	453.33		1.81		
	Number of Species				18					
	Number of Hybrids				0					

River Code: **10-218**	Stream: **Crooked Creek**	Sample Date: **2007**
River Mile: **2.20**	Location: upst. S.R. 73	Date Range: 07/12/2007
Time Fished: 1800 sec	Drainage: 8.3 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	17	25.50	1.55	0.77	3.99	30.24
Northern Hog Sucker	R	I	S	M	5	7.50	0.46	0.33	1.69	43.60
White Sucker	W	O	S	T	80	120.00	7.31	4.40	22.78	36.67
Western Blacknose Dace	N	G	S	T	3	4.50	0.27	0.02	0.11	4.67
Creek Chub	N	G	N	T	158	237.00	14.44	1.90	9.83	8.01
South. Redbelly Dace	N	H	S		1	1.50	0.09	0.01	0.03	4.00
Scarlet Shiner	N	I	S	M	22	33.00	2.01	0.09	0.45	2.64
Striped Shiner	N	I	S		264	396.00	24.13	3.71	19.19	9.36
Silverjaw Minnow	N	I	M		16	24.00	1.46	0.09	0.46	3.69
Fathead Minnow	N	O	C	T	1	1.50	0.09	0.02	0.09	12.00
Bluntnose Minnow	N	O	C	T	124	186.00	11.33	0.64	3.29	3.41
Central Stoneroller	N	H	N		172	258.00	15.72	1.48	7.65	5.73
Yellow Bullhead		I	C	T	2	3.00	0.18	0.06	0.30	19.00
Rock Bass	S	C	C		19	28.50	1.74	2.08	10.77	73.00
Green Sunfish	S	I	C	T	31	46.50	2.83	0.86	4.43	18.39
Bluegill Sunfish	S	I	C	P	41	61.50	3.75	0.50	2.61	8.20
Longear Sunfish	S	I	C	M	104	156.00	9.51	2.20	11.38	14.09
Blackside Darter	D	I	S		2	3.00	0.18	0.03	0.16	10.00
Greenside Darter	D	I	S	M	13	19.50	1.19	0.06	0.31	3.08
Rainbow Darter	D	I	S	M	12	18.00	1.10	0.05	0.27	2.92
Orangethroat Darter	D	I	S		5	7.50	0.46	0.02	0.12	3.00
Fantail Darter	D	I	C		2	3.00	0.18	0.02	0.12	7.50
	Mile Total				1,094	1,641.00		19.32		
	Number of Species				22					
	Number of Hybrids				0					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **20.50**	Location: Heaton Rd.	Date Range: 08/08/2007
Time Fished: 1196 sec	Drainage: 4.8 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	20	40.00	6.12	0.05	2.37	1.17
Creek Chub	N	G	N	T	30	60.00	9.17	0.22	11.13	3.68
Scarlet Shiner	N	I	S	M	3	6.00	0.92	0.01	0.71	2.33
Striped Shiner	N	I	S		23	46.00	7.03	0.19	9.67	4.17
Silverjaw Minnow	N	I	M		3	6.00	0.92	0.01	0.50	1.67
Bluntnose Minnow	N	O	C	T	66	132.00	20.18	0.45	22.52	3.38
Central Stoneroller	N	H	N		71	142.00	21.71	0.48	24.18	3.38
Green Sunfish	S	I	C	T	8	16.00	2.45	0.27	13.55	16.83
Longear Sunfish	S	I	C	M	5	10.00	1.53	0.10	4.84	9.60
Johnny Darter	D	I	C		30	60.00	9.17	0.03	1.71	0.57
Greenside Darter	D	I	S	M	1	2.00	0.31	0.01	0.40	4.00
Rainbow Darter	D	I	S	M	11	22.00	3.36	0.04	1.91	1.73
Orangethroat Darter	D	I	S		13	26.00	3.98	0.04	1.81	1.38
Fantail Darter	D	I	C		43	86.00	13.15	0.09	4.74	1.09
	Mile Total				327	654.00		1.99		
	Number of Species				14					
	Number of Hybrids				0					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **17.90**	Location: Melblanc Rd.	Date Range: 07/06/2007
Time Fished: 1844 sec	Drainage: 12.0 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	5	7.50	0.85	0.72	8.49	96.00
Northern Hog Sucker	R	I	S	M	14	21.00	2.39	1.07	12.63	51.00
White Sucker	W	O	S	T	17	25.50	2.90	2.29	26.99	89.71
Creek Chub	N	G	N	T	19	28.50	3.24	0.11	1.24	3.68
Silver Shiner	N	I	S	I	5	7.50	0.85	0.04	0.41	4.60
Scarlet Shiner	N	I	S	M	29	43.50	4.95	0.11	1.26	2.45
Striped Shiner	N	I	S		37	55.50	6.31	0.48	5.66	8.65
Sand Shiner	N	I	M	M	2	3.00	0.34	0.01	0.07	2.00
Silverjaw Minnow	N	I	M		23	34.50	3.92	0.08	0.92	2.26
Bluntnose Minnow	N	O	C	T	242	363.00	41.30	0.77	9.07	2.12
Central Stoneroller	N	H	N		48	72.00	8.19	0.44	5.20	6.13
Yellow Bullhead		I	C	T	7	10.50	1.19	0.77	9.12	73.57
Black Crappie	S	I	C		1	1.50	0.17	0.20	2.41	136.00
Rock Bass	S	C	C		2	3.00	0.34	0.15	1.77	50.00
Smallmouth Bass	F	C	C	M	1	1.50	0.17	0.27	3.21	181.00
Green Sunfish	S	I	C	T	18	27.00	3.07	0.30	3.50	11.00
Longear Sunfish	S	I	C	M	34	51.00	5.80	0.51	6.05	10.06
Johnny Darter	D	I	C		5	7.50	0.85	0.01	0.09	1.00
Greenside Darter	D	I	S	M	15	22.50	2.56	0.06	0.67	2.53
Rainbow Darter	D	I	S	M	22	33.00	3.75	0.04	0.45	1.14
Fantail Darter	D	I	C		40	60.00	6.83	0.07	0.81	1.15
	Mile Total				586	879.00		8.48		
	Number of Species				21					
	Number of Hybrids				0					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **15.20**	Location: dst. Turkey Run	Date Range: 07/10/2007
Time Fished: 3854 sec	Drainage: 22.7 sq mi	Thru: 08/07/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	24	18.00	0.76	0.53	2.97	29.63
Northern Hog Sucker	R	I	S	M	26	19.50	0.83	1.18	6.57	60.47
White Sucker	W	O	S	T	35	26.25	1.11	1.95	10.85	74.11
Creek Chub	N	G	N	T	51	38.25	1.62	0.17	0.96	4.48
Silver Shiner	N	I	S	I	27	20.25	0.86	0.03	0.18	1.59
Scarlet Shiner	N	I	S	M	114	85.50	3.63	0.15	0.83	1.74
Striped Shiner	N	I	S		346	259.50	11.02	0.64	3.59	2.48
Sand Shiner	N	I	M	M	60	45.00	1.91	0.08	0.45	1.79
Mimic Shiner	N	I	M	I	5	3.75	0.16	0.00	0.02	1.00
Silverjaw Minnow	N	I	M		129	96.75	4.11	0.18	0.98	1.82
Bluntnose Minnow	N	O	C	T	827	620.25	26.34	1.66	9.23	2.67
Central Stoneroller	N	H	N		151	113.25	4.81	0.49	2.74	4.34
Yellow Bullhead		I	C	T	12	9.00	0.38	0.12	0.65	12.92
Rock Bass	S	C	C		24	18.00	0.76	0.88	4.91	48.96
Smallmouth Bass	F	C	C	M	21	15.75	0.67	2.12	11.81	134.53
Spotted Bass	F	C	C		26	19.50	0.83	0.35	1.93	17.77
Green Sunfish	S	I	C	T	132	99.00	4.20	1.79	9.95	18.03
Bluegill Sunfish	S	I	C	P	67	50.25	2.13	0.51	2.83	10.09
Longear Sunfish	S	I	C	M	639	479.25	20.35	4.45	24.82	9.29
Green Sf X Longear Sf					1	0.75	0.03	0.06	0.32	75.00
Green Sf X Hybrid					2	1.50	0.06	0.30	1.69	202.00
Johnny Darter	D	I	C		99	74.25	3.15	0.04	0.25	0.60
Greenside Darter	D	I	S	M	81	60.75	2.58	0.12	0.67	1.98
Rainbow Darter	D	I	S	M	165	123.75	5.25	0.08	0.43	0.63
Fantail Darter	D	I	C		76	57.00	2.42	0.07	0.37	1.18
	Mile Total				3,140	2,355.00		17.94		
	Number of Species				23					
	Number of Hybrids				2					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **12.70**	Location: Buck Run Rd.	Date Range: 07/11/2007
Time Fished: 3958 sec	Drainage: 27.3 sq mi	Thru: 08/07/2007
Dist Fished: 0.38 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	8	6.42	0.51	0.27	3.15	42.13
Northern Hog Sucker	R	I	S	M	80	63.75	5.08	1.14	13.37	18.00
White Sucker	W	O	S	T	32	26.08	2.08	0.43	4.98	16.61
Creek Chub	N	G	N	T	8	6.17	0.49	0.04	0.43	6.00
Silver Shiner	N	I	S	I	12	10.00	0.80	0.01	0.10	0.83
Scarlet Shiner	N	I	S	M	35	27.58	2.20	0.05	0.60	1.88
Striped Shiner	N	I	S		175	142.17	11.32	0.51	5.92	3.67
Sand Shiner	N	I	M	M	9	7.00	0.56	0.01	0.11	1.33
Mimic Shiner	N	I	M	I	3	2.50	0.20	0.00	0.02	0.67
Silverjaw Minnow	N	I	M		66	54.00	4.30	0.06	0.70	1.12
Bluntnose Minnow	N	O	C	T	182	148.33	11.81	0.41	4.80	2.78
Central Stoneroller	N	H	N		287	225.42	17.95	1.16	13.57	5.23
Yellow Bullhead		I	C	T	8	6.25	0.50	0.74	8.62	118.63
Stonecat Madtom		I	C	I	1	0.75	0.06	0.01	0.15	17.00
Rock Bass	S	C	C		7	5.42	0.43	0.28	3.32	52.71
Smallmouth Bass	F	C	C	M	51	39.92	3.18	0.62	7.28	15.90
Spotted Bass	F	C	C		3	2.42	0.19	0.19	2.24	81.67
Green Sunfish	S	I	C	T	38	30.25	2.41	0.64	7.52	21.62
Bluegill Sunfish	S	I	C	P	13	10.25	0.82	0.09	1.02	8.62
Longear Sunfish	S	I	C	M	101	80.50	6.41	1.26	14.73	15.81
Logperch	D	I	S	M	2	1.67	0.13	0.02	0.19	10.00
Johnny Darter	D	I	C		24	19.67	1.57	0.01	0.16	0.71
Greenside Darter	D	I	S	M	154	120.67	9.61	0.31	3.57	2.53
Banded Darter	D	I	S	I	1	0.83	0.07	0.00	0.02	2.00
Rainbow Darter	D	I	S	M	114	88.92	7.08	0.11	1.31	1.26
Fantail Darter	D	I	C		166	128.92	10.27	0.18	2.12	1.40
	Mile Total				1,580	1,255.83		8.54		
	Number of Species				26					
	Number of Hybrids				0					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **10.50**	Location: upst. Little West Fork	Date Range: 07/11/2007
Time Fished: 4119 sec	Drainage: 38.9 sq mi	Thru: 08/08/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		1	0.75	0.03	0.04	0.11	50.00
Quillback	C	O	M		2	1.50	0.07	0.01	0.04	9.50
Black Redhorse	R	I	S	I	79	59.25	2.59	14.53	41.72	245.23
Golden Redhorse	R	I	S	M	140	105.00	4.59	5.35	15.36	50.94
Northern Hog Sucker	R	I	S	M	77	57.75	2.52	2.52	7.22	43.55
White Sucker	W	O	S	T	106	79.50	3.47	0.74	2.13	9.32
Common Carp	G	O	M	T	14	10.50	0.46	0.05	0.16	5.14
Creek Chub	N	G	N	T	2	1.50	0.07	0.00	0.01	2.00
Silver Shiner	N	I	S	I	135	101.25	4.42	0.26	0.73	2.52
Scarlet Shiner	N	I	S	M	202	151.50	6.62	0.22	0.62	1.43
Striped Shiner	N	I	S		390	292.50	12.77	1.61	4.62	5.50
Spotfin Shiner	N	I	M		1	0.75	0.03	0.00	0.01	4.00
Sand Shiner	N	I	M	M	148	111.00	4.85	0.23	0.67	2.10
Mimic Shiner	N	I	M	I	18	13.50	0.59	0.03	0.07	1.83
Silverjaw Minnow	N	I	M		83	62.25	2.72	0.07	0.21	1.17
Bluntnose Minnow	N	O	C	T	844	633.00	27.64	1.55	4.46	2.46
Central Stoneroller	N	H	N		220	165.00	7.21	0.60	1.72	3.62
Yellow Bullhead		I	C	T	16	12.00	0.52	0.40	1.16	33.63
Stonecat Madtom		I	C	I	1	0.75	0.03	0.01	0.02	10.00
Brindled Madtom		I	C	I	5	3.75	0.16	0.03	0.09	8.20
Rock Bass	S	C	C		16	12.00	0.52	0.59	1.70	49.25
Smallmouth Bass	F	C	C	M	20	15.00	0.66	2.79	8.00	185.81
Spotted Bass	F	C	C		2	1.50	0.07	0.13	0.38	88.50
Green Sunfish	S	I	C	T	56	42.00	1.83	0.93	2.66	22.03
Bluegill Sunfish	S	I	C	P	1	0.75	0.03	0.02	0.05	25.00
Longear Sunfish	S	I	C	M	130	97.50	4.26	1.60	4.58	16.37
Green Sf X Bluegill Sf					1	0.75	0.03	0.03	0.09	40.00
Blackside Darter	D	I	S		1	0.75	0.03	0.01	0.02	10.00
Logperch	D	I	S	M	33	24.75	1.08	0.18	0.50	7.06
Johnny Darter	D	I	C		43	32.25	1.41	0.02	0.05	0.55
Greenside Darter	D	I	S	M	60	45.00	1.97	0.10	0.30	2.30
Banded Darter	D	I	S	I	6	4.50	0.20	0.01	0.04	2.67
Rainbow Darter	D	I	S	M	111	83.25	3.64	0.07	0.21	0.89
Fantail Darter	D	I	C		89	66.75	2.92	0.10	0.30	1.57
	Mile Total				3,053	2,289.75		34.83		
	Number of Species				33					
	Number of Hybrids				1					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **6.10**	Location: St. Rt. 32	Date Range: 07/16/2007
Time Fished: 5215 sec	Drainage: 76.0 sq mi	Thru: 08/15/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Longnose Gar		P	M		1	0.75	0.09	0.01	0.04	11.00
Quillback	C	O	M		2	1.50	0.18	1.50	7.41	1,000.00
Black Redhorse	R	I	S	I	9	6.75	0.80	0.93	4.59	137.50
Golden Redhorse	R	I	S	M	58	43.50	5.13	6.15	30.38	141.33
Northern Hog Sucker	R	I	S	M	10	7.50	0.88	0.69	3.42	92.20
White Sucker	W	O	S	T	2	1.50	0.18	0.00	0.02	3.00
Common Carp	G	O	M	T	1	0.75	0.09	0.02	0.07	20.00
Silver Shiner	N	I	S	I	37	27.75	3.27	0.06	0.30	2.20
Scarlet Shiner	N	I	S	M	12	9.00	1.06	0.01	0.06	1.33
Striped Shiner	N	I	S		57	42.75	5.04	0.29	1.44	6.82
Sand Shiner	N	I	M	M	7	5.25	0.62	0.01	0.03	1.29
Mimic Shiner	N	I	M	I	21	15.75	1.86	0.02	0.07	0.95
Silverjaw Minnow	N	I	M		1	0.75	0.09	0.00	0.01	2.00
Bluntnose Minnow	N	O	C	T	128	96.00	11.33	0.20	0.98	2.06
Central Stoneroller	N	H	N		71	53.25	6.28	0.20	0.99	3.75
Yellow Bullhead		I	C	T	5	3.75	0.44	0.17	0.84	45.60
Flathead Catfish	F	P	C		1	0.75	0.09	1.73	8.52	2,300.00
Rock Bass	S	C	C		50	37.50	4.42	0.71	3.51	18.96
Smallmouth Bass	F	C	C	M	50	37.50	4.42	3.14	15.53	83.82
Spotted Bass	F	C	C		28	21.00	2.48	0.78	3.84	36.98
Largemouth Bass	F	C	C		17	12.75	1.50	0.11	0.52	8.30
Green Sunfish	S	I	C	T	137	102.75	12.12	1.85	9.14	17.99
Bluegill Sunfish	S	I	C	P	12	9.00	1.06	0.04	0.21	4.75
Orangespotted Sunfish	S	I	C		1	0.75	0.09	0.00	0.01	3.00
Longear Sunfish	S	I	C	M	184	138.00	16.28	1.26	6.25	9.16
Green Sf X Hybrid					1	0.75	0.09	0.05	0.24	65.00
Blackside Darter	D	I	S		4	3.00	0.35	0.01	0.03	1.75
Logperch	D	I	S	M	58	43.50	5.13	0.09	0.44	2.03
Johnny Darter	D	I	C		6	4.50	0.53	0.00	0.01	0.67
Greenside Darter	D	I	S	M	74	55.50	6.55	0.12	0.61	2.23
Banded Darter	D	I	S	I	4	3.00	0.35	0.01	0.03	1.75
Rainbow Darter	D	I	S	M	62	46.50	5.49	0.06	0.28	1.22
Fantail Darter	D	I	C		19	14.25	1.68	0.04	0.18	2.53
	Mile Total				1,130	847.50		20.24		
	Number of Species				32					
	Number of Hybrids				1					

River Code: **10-220**	Stream: **West Fork Ohio Brush Creek**	Sample Date: **2007**
River Mile: **1.10**	Location: dst. ford, dst. Georges Creek	Date Range: 07/17/2007
Time Fished: 3621 sec	Drainage: 129.0 sq mi	Thru: 08/15/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Quillback	C	O	M		6	4.50	0.35	0.03	0.17	7.20
Black Redhorse	R	I	S	I	41	30.75	2.39	3.17	16.84	103.12
Golden Redhorse	R	I	S	M	72	54.00	4.19	2.27	12.03	41.96
Northern Hog Sucker	R	I	S	M	76	57.00	4.42	1.54	8.17	26.99
White Sucker	W	O	S	T	1	0.75	0.06	0.00	0.02	6.00
Smallmouth Redhorse	R	I	S	M	2	1.50	0.12	0.08	0.40	50.00
Creek Chub	N	G	N	T	3	2.25	0.17	0.01	0.03	2.67
Silver Shiner	N	I	S	I	24	18.00	1.40	0.05	0.25	2.67
Scarlet Shiner	N	I	S	M	24	18.00	1.40	0.03	0.14	1.43
Striped Shiner	N	I	S		239	179.25	13.90	0.67	3.58	3.76
Spotfin Shiner	N	I	M		15	11.25	0.87	0.03	0.17	2.87
Sand Shiner	N	I	M	M	15	11.25	0.87	0.02	0.11	1.80
Silverjaw Minnow	N	I	M		4	3.00	0.23	0.01	0.04	2.25
Fathead Minnow	N	O	C	T	1	0.75	0.06	0.01	0.04	10.00
Bluntnose Minnow	N	O	C	T	192	144.00	11.17	0.38	2.00	2.61
Central Stoneroller	N	H	N		299	224.25	17.39	0.95	5.02	4.21
Channel Catfish	F		C		1	0.75	0.06	0.24	1.27	320.00
Yellow Bullhead		I	C	T	5	3.75	0.29	0.38	2.00	100.60
Flathead Catfish	F	P	C		3	2.25	0.17	0.43	2.29	191.67
Stonecat Madtom		I	C	I	2	1.50	0.12	0.01	0.06	7.50
Brindled Madtom		I	C	I	4	3.00	0.23	0.01	0.07	4.25
Brook Silverside		I	M	M	7	5.25	0.41	0.01	0.05	1.57
Rock Bass	S	C	C		59	44.25	3.43	1.50	7.99	33.98
Smallmouth Bass	F	C	C	M	51	38.25	2.97	2.46	13.07	64.34
Spotted Bass	F	C	C		6	4.50	0.35	0.31	1.64	68.67
Green Sunfish	S	I	C	T	33	24.75	1.92	0.47	2.49	18.98
Longear Sunfish	S	I	C	M	240	180.00	13.96	3.16	16.77	17.55
Green Sf X Hybrid					1	0.75	0.06	0.03	0.16	40.00
Blackside Darter	D	I	S		3	2.25	0.17	0.01	0.05	3.67
Logperch	D	I	S	M	23	17.25	1.34	0.23	1.19	13.04
Johnny Darter	D	I	C		6	4.50	0.35	0.01	0.04	1.50
Greenside Darter	D	I	S	M	107	80.25	6.22	0.22	1.16	2.72
Banded Darter	D	I	S	I	3	2.25	0.17	0.00	0.02	2.00
Rainbow Darter	D	I	S	M	75	56.25	4.36	0.07	0.37	1.23
Orangethroat Darter	D	I	S		1	0.75	0.06	0.00	0.01	1.00
Fantail Darter	D	I	C		75	56.25	4.36	0.06	0.32	1.06
	Mile Total				1,719	1,289.25		18.84		
	Number of Species				35					
	Number of Hybrids				1					

River Code: **10-222**	Stream: **Georges Creek**	Sample Date: **2007**
River Mile: **3.20**	Location: lane off St. Rt. 770	Date Range: 07/13/2007
Time Fished: 1107 sec	Drainage: 5.9 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	23	46.00	10.45	2.42	54.21	52.50
Creek Chub	N	G	N	T	2	4.00	0.91	0.01	0.27	3.00
Striped Shiner	N	I	S		6	12.00	2.73	0.14	3.23	12.00
Fathead Minnow	N	O	C	T	16	32.00	7.27	0.03	0.61	0.83
Bluntnose Minnow	N	O	C	T	15	30.00	6.82	0.03	0.76	1.13
Central Stoneroller	N	H	N		26	52.00	11.82	0.18	3.97	3.40
Yellow Bullhead		I	C	T	6	12.00	2.73	0.46	10.24	38.00
Green Sunfish	S	I	C	T	38	76.00	17.27	0.52	11.74	6.89
Bluegill Sunfish	S	I	C	P	10	20.00	4.55	0.10	2.15	4.80
Longear Sunfish	S	I	C	M	14	28.00	6.36	0.33	7.41	11.79
Green Sf X Longear Sf					1	2.00	0.45	0.10	2.15	48.00
Johnny Darter	D	I	C		13	26.00	5.91	0.02	0.45	0.75
Rainbow Darter	D	I	S	M	2	4.00	0.91	0.01	0.13	1.50
Fantail Darter	D	I	C		48	96.00	21.82	0.12	2.69	1.25
	Mile Total				220	440.00		4.46		
	Number of Species				13					
	Number of Hybrids				1					

River Code: **10-222**	Stream: **Georges Creek**	Sample Date: **2007**
River Mile: **0.10**	Location: Nicholas Rd.	Date Range: 07/23/2007
Time Fished: 2727 sec	Drainage: 12.3 sq mi	
Dist Fished: 0.18 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Longnose Gar		P	M		1	1.67	0.12	0.03	0.25	18.00
Black Redhorse	R	I	S	I	6	10.00	0.69	0.62	5.11	61.50
Golden Redhorse	R	I	S	M	13	21.67	1.50	0.39	3.20	17.77
Northern Hog Sucker	R	I	S	M	8	13.33	0.92	1.04	8.65	78.13
White Sucker	W	O	S	T	15	25.00	1.73	0.21	1.73	8.33
Creek Chub	N	G	N	T	15	25.00	1.73	0.17	1.39	6.73
Silver Shiner	N	I	S	I	3	5.00	0.35	0.01	0.08	2.00
Scarlet Shiner	N	I	S	M	31	51.67	3.58	0.08	0.67	1.57
Striped Shiner	N	I	S		138	230.00	15.94	1.05	8.72	4.57
Mimic Shiner	N	I	M	I	1	1.67	0.12	0.00	0.02	1.00
Silverjaw Minnow	N	I	M		8	13.33	0.92	0.04	0.31	2.75
Bluntnose Minnow	N	O	C	T	167	278.33	19.28	0.67	5.53	2.39
Central Stoneroller	N	H	N		190	316.67	21.94	0.87	7.20	2.74
Yellow Bullhead		I	C	T	7	11.67	0.81	0.52	4.34	44.86
Stonecat Madtom		I	C	I	1	1.67	0.12	0.06	0.48	35.00
Rock Bass	S	C	C		15	25.00	1.73	1.08	8.99	43.33
Smallmouth Bass	F	C	C	M	7	11.67	0.81	0.12	0.97	10.00
Spotted Bass	F	C	C		4	6.67	0.46	1.75	14.53	262.50
Green Sunfish	S	I	C	T	24	40.00	2.77	1.17	9.69	29.17
Bluegill Sunfish	S	I	C	P	2	3.33	0.23	0.03	0.27	9.50
Longear Sunfish	S	I	C	M	53	88.33	6.12	1.78	14.81	20.19
Blackside Darter	D	I	S		2	3.33	0.23	0.02	0.17	6.00
Logperch	D	I	S	M	1	1.67	0.12	0.00	0.02	2.00
Johnny Darter	D	I	C		6	10.00	0.69	0.02	0.14	1.67
Greenside Darter	D	I	S	M	6	10.00	0.69	0.04	0.29	3.50
Rainbow Darter	D	I	S	M	69	115.00	7.97	0.14	1.16	1.22
Fantail Darter	D	I	C		73	121.67	8.43	0.16	1.30	1.29
	Mile Total				866	1,443.33		12.05		
	Number of Species				27					
	Number of Hybrids				0					

River Code: **10-224**	Stream: **Cherry Fork**	Sample Date: **2007**
River Mile: **8.70**	Location: St. Rt. 136	Date Range: 07/24/2007
Time Fished: 1195 sec	Drainage: 5.7 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	20	40.00	3.15	0.15	3.12	3.80
Creek Chub	N	G	N	T	90	180.00	14.17	1.62	33.24	9.00
Scarlet Shiner	N	I	S	M	19	38.00	2.99	0.11	2.22	2.84
Striped Shiner	N	I	S		43	86.00	6.77	0.08	1.64	0.93
Silverjaw Minnow	N	I	M		1	2.00	0.16	0.00	0.04	1.00
Fathead Minnow	N	O	C	T	36	72.00	5.67	0.09	1.91	1.29
Bluntnose Minnow	N	O	C	T	169	338.00	26.61	0.75	15.35	2.21
Central Stoneroller	N	H	N		47	94.00	7.40	0.24	4.82	2.50
Striped Sh X Stoneroller					1	2.00	0.16	0.00	0.08	2.00
Yellow Bullhead		I	C	T	9	18.00	1.42	0.89	18.20	49.25
Green Sunfish	S	I	C	T	19	38.00	2.99	0.47	9.64	12.38
Longear Sunfish	S	I	C	M	6	12.00	0.94	0.10	1.97	8.00
Johnny Darter	D	I	C		13	26.00	2.05	0.02	0.49	0.92
Rainbow Darter	D	I	S	M	15	30.00	2.36	0.03	0.70	1.13
Orangethroat Darter	D	I	S		18	36.00	2.83	0.04	0.82	1.11
Fantail Darter	D	I	C		129	258.00	20.31	0.28	5.75	1.09
	Mile Total				635	1,270.00		4.87		
	Number of Species				15					
	Number of Hybrids				1					

River Code: **10-224**	Stream: **Cherry Fork**	Sample Date: **2007**
River Mile: **7.50**	Location: Paint Rd.	Date Range: 07/24/2007
Time Fished: 1731 sec	Drainage: 9.8 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	1	1.50	0.11	0.07	0.63	47.00
Northern Hog Sucker	R	I	S	M	1	1.50	0.11	0.15	1.34	101.00
White Sucker	W	O	S	T	50	75.00	5.35	2.66	23.39	35.42
Creek Chub	N	G	N	T	25	37.50	2.67	0.65	5.74	17.39
Scarlet Shiner	N	I	S	M	13	19.50	1.39	0.04	0.32	1.85
Striped Shiner	N	I	S		174	261.00	18.61	1.71	15.05	6.55
Silverjaw Minnow	N	I	M		23	34.50	2.46	0.03	0.26	0.87
Fathead Minnow	N	O	C	T	12	18.00	1.28	0.02	0.15	0.92
Bluntnose Minnow	N	O	C	T	195	292.50	20.86	0.62	5.48	2.13
Central Stoneroller	N	H	N		97	145.50	10.37	0.49	4.31	3.36
Yellow Bullhead		I	C	T	18	27.00	1.93	1.51	13.29	55.88
Green Sunfish	S	I	C	T	101	151.50	10.80	1.11	9.74	7.30
Bluegill Sunfish	S	I	C	P	13	19.50	1.39	0.24	2.09	12.15
Longear Sunfish	S	I	C	M	113	169.50	12.09	1.85	16.29	10.91
Green Sf X Hybrid					1	1.50	0.11	0.01	0.10	7.00
Johnny Darter	D	I	C		16	24.00	1.71	0.02	0.19	0.92
Greenside Darter	D	I	S	M	3	4.50	0.32	0.02	0.21	5.33
Rainbow Darter	D	I	S	M	31	46.50	3.32	0.06	0.50	1.23
Orangethroat Darter	D	I	S		1	1.50	0.11	0.00	0.03	2.00
Fantail Darter	D	I	C		47	70.50	5.03	0.10	0.91	1.46
	Mile Total				935	1,402.50		11.35		
	Number of Species				19					
	Number of Hybrids				1					

River Code: **10-224**	Stream: **Cherry Fork**	Sample Date: **2007**
River Mile: **2.60**	Location: Graces Run Rd.	Date Range: 07/24/2007
Time Fished: 1760 sec	Drainage: 20.3 sq mi	Thru: 08/14/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	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
Golden Redhorse	R	I	S	M	30	22.50	1.00	0.46	4.54	20.44
Northern Hog Sucker	R	I	S	M	24	18.00	0.80	0.63	6.22	35.01
White Sucker	W	O	S	T	127	95.25	4.25	1.50	14.83	15.78
Common Carp	G	O	M	T	1	0.75	0.03	0.01	0.10	14.00
Creek Chub	N	G	N	T	9	6.75	0.30	0.05	0.47	7.11
Silver Shiner	N	I	S	I	4	3.00	0.13	0.01	0.09	3.00
Scarlet Shiner	N	I	S	M	56	42.00	1.88	0.09	0.89	2.14
Striped Shiner	N	I	S		116	87.00	3.88	0.33	3.25	3.79
Silverjaw Minnow	N	I	M		388	291.00	12.99	0.47	4.64	1.62
Fathead Minnow	N	O	C	T	6	4.50	0.20	0.01	0.09	2.00
Bluntnose Minnow	N	O	C	T	1,152	864.00	38.58	1.36	13.38	1.57
Central Stoneroller	N	H	N		479	359.25	16.04	1.61	15.92	4.49
Yellow Bullhead		I	C	T	13	9.75	0.44	0.43	4.28	44.54
Rock Bass	S	C	C		7	5.25	0.23	0.33	3.21	62.00
Largemouth Bass	F	C	C		1	0.75	0.03	0.09	0.89	120.00
Green Sunfish	S	I	C	T	78	58.50	2.61	0.67	6.63	11.49
Bluegill Sunfish	S	I	C	P	28	21.00	0.94	0.27	2.69	12.98
Longear Sunfish	S	I	C	M	166	124.50	5.56	1.47	14.52	11.83
Johnny Darter	D	I	C		5	3.75	0.17	0.00	0.04	1.00
Greenside Darter	D	I	S	M	52	39.00	1.74	0.10	0.96	2.49
Rainbow Darter	D	I	S	M	26	19.50	0.87	0.02	0.22	1.12
Orangethroat Darter	D	I	S		64	48.00	2.14	0.06	0.59	1.24
Fantail Darter	D	I	C		154	115.50	5.16	0.16	1.60	1.40
	Mile Total				2,986	2,239.50		10.14		
	Number of Species				23					
	Number of Hybrids				0					

River Code: **10-225**	Stream: **Grace Run**	Sample Date: **2007**
River Mile: **1.30**	Location: St. Rt. 247	Date Range: 08/07/2007
Time Fished: 1201 sec	Drainage: 6.3 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	85	170.00	8.57	6.20	40.82	36.47
Creek Chub	N	G	N	T	29	58.00	2.92	0.46	3.03	7.93
Scarlet Shiner	N	I	S	M	34	68.00	3.43	0.14	0.90	2.00
Striped Shiner	N	I	S		33	66.00	3.33	0.14	0.90	2.06
Silverjaw Minnow	N	I	M		1	2.00	0.10	0.00	0.03	2.00
Bluntnose Minnow	N	O	C	T	187	374.00	18.85	1.06	6.98	2.83
Central Stoneroller	N	H	N		291	582.00	29.33	2.43	15.97	4.17
Yellow Bullhead		I	C	T	5	10.00	0.50	0.44	2.91	44.20
Green Sunfish	S	I	C	T	75	150.00	7.56	1.70	11.19	11.33
Bluegill Sunfish	S	I	C	P	8	16.00	0.81	0.21	1.37	13.00
Longear Sunfish	S	I	C	M	151	302.00	15.22	2.13	14.01	7.05
Johnny Darter	D	I	C		24	48.00	2.42	0.08	0.54	1.71
Rainbow Darter	D	I	S	M	22	44.00	2.22	0.04	0.26	0.91
Orangethroat Darter	D	I	S		1	2.00	0.10	0.00	0.03	2.00
Fantail Darter	D	I	C		46	92.00	4.64	0.16	1.08	1.78
	Mile Total				992	1,984.00		15.19		
	Number of Species				15					
	Number of Hybrids				0					

River Code: **10-228**	Stream: **Buck Run**	Sample Date: **2007**
River Mile: **0.40**	Location: Armstrong Rd.	Date Range: 07/16/2007
Time Fished: 1460 sec	Drainage: 10.7 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	14	28.00	2.39	1.49	13.71	53.21
Northern Hog Sucker	R	I	S	M	2	4.00	0.34	0.23	2.15	58.50
White Sucker	W	O	S	T	17	34.00	2.90	1.15	10.58	33.82
Creek Chub	N	G	N	T	4	8.00	0.68	0.03	0.28	3.75
Scarlet Shiner	N	I	S	M	46	92.00	7.85	0.14	1.29	1.52
Striped Shiner	N	I	S		80	160.00	13.65	0.65	5.98	4.06
Silverjaw Minnow	N	I	M		1	2.00	0.17	0.00	0.04	2.00
Bluntnose Minnow	N	O	C	T	116	232.00	19.80	1.04	9.57	4.48
Central Stoneroller	N	H	N		64	128.00	10.92	0.52	4.82	4.10
Yellow Bullhead		I	C	T	4	8.00	0.68	0.22	2.02	27.50
Brindled Madtom		I	C	I	2	4.00	0.34	0.03	0.28	7.50
Smallmouth Bass	F	C	C	M	12	24.00	2.05	1.20	11.04	50.00
Spotted Bass	F	C	C		1	2.00	0.17	0.19	1.73	94.00
Green Sunfish	S	I	C	T	71	142.00	12.12	2.00	18.40	14.08
Bluegill Sunfish	S	I	C	P	1	2.00	0.17	0.05	0.50	27.00
Longear Sunfish	S	I	C	M	62	124.00	10.58	1.65	15.18	13.31
Blackside Darter	D	I	S		1	2.00	0.17	0.01	0.06	3.00
Johnny Darter	D	I	C		2	4.00	0.34	0.00	0.04	1.00
Greenside Darter	D	I	S	M	11	22.00	1.88	0.07	0.63	3.09
Banded Darter	D	I	S	I	1	2.00	0.17	0.00	0.04	2.00
Rainbow Darter	D	I	S	M	24	48.00	4.10	0.06	0.52	1.17
Orangethroat Darter	D	I	S		3	6.00	0.51	0.01	0.13	2.33
Fantail Darter	D	I	C		47	94.00	8.02	0.11	1.03	1.19
	Mile Total				586	1,172.00		10.87		
	Number of Species				23					
	Number of Hybrids				0					

River Code: **10-229**	Stream: **Little West Fork**	Sample Date: **2007**
River Mile: **6.30**	Location: Forsythe Rd.	Date Range: 08/01/2007
Time Fished: 1135 sec	Drainage: 5.5 sq mi	
Dist Fished: 0.13 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	104	240.00	21.05	1.04	26.61	4.33
Creek Chub	N	G	N	T	87	200.77	17.61	1.07	27.51	5.34
Striped Shiner	N	I	S		34	78.46	6.88	0.17	4.31	2.15
Bluntnose Minnow	N	O	C	T	149	343.85	30.16	0.26	6.77	0.77
Central Stoneroller	N	H	N		69	159.23	13.97	0.60	15.33	3.76
Green Sunfish	S	I	C	T	11	25.39	2.23	0.62	15.97	24.55
Bluegill Sunfish	S	I	C	P	1	2.31	0.20	0.04	1.13	19.00
Johnny Darter	D	I	C		1	2.31	0.20	0.00	0.05	1.00
Rainbow Darter	D	I	S	M	20	46.15	4.05	0.05	1.26	1.05
Orangethroat Darter	D	I	S		14	32.31	2.83	0.03	0.64	0.79
Fantail Darter	D	I	C		4	9.23	0.81	0.02	0.41	1.75
	Mile Total				494	1,140.00		3.90		
	Number of Species				11					
	Number of Hybrids				0					

River Code: **10-229**	Stream: **Little West Fork**	Sample Date: **2007**
River Mile: **5.70**	Location: Shaw-Baker Rd.	Date Range: 08/01/2007
Time Fished: 1502 sec	Drainage: 9.2 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	8	16.00	1.51	0.33	4.53	20.50
White Sucker	W	O	S	T	55	110.00	10.40	1.10	15.25	10.04
Creek Chub	N	G	N	T	52	104.00	9.83	1.60	22.10	15.38
Scarlet Shiner	N	I	S	M	5	10.00	0.95	0.02	0.25	1.80
Striped Shiner	N	I	S		55	110.00	10.40	0.31	4.31	2.84
Silverjaw Minnow	N	I	M		10	20.00	1.89	0.03	0.39	1.40
Bluntnose Minnow	N	O	C	T	32	64.00	6.05	0.18	2.49	2.81
Central Stoneroller	N	H	N		95	190.00	17.96	1.53	21.16	8.06
Smallmouth Bass	F	C	C	M	7	14.00	1.32	0.06	0.83	4.29
Green Sunfish	S	I	C	T	38	76.00	7.18	1.30	17.96	17.11
Bluegill Sunfish	S	I	C	P	1	2.00	0.19	0.04	0.55	20.00
Longear Sunfish	S	I	C	M	8	16.00	1.51	0.20	2.71	12.25
Green Sf X Bluegill Sf					2	4.00	0.38	0.08	1.16	21.00
Johnny Darter	D	I	C		30	60.00	5.67	0.02	0.33	0.40
Greenside Darter	D	I	S	M	15	30.00	2.84	0.10	1.38	3.33
Rainbow Darter	D	I	S	M	71	142.00	13.42	0.18	2.42	1.24
Orangethroat Darter	D	I	S		5	10.00	0.95	0.02	0.28	2.00
Fantail Darter	D	I	C		40	80.00	7.56	0.14	1.91	1.73
	Mile Total				529	1,058.00		7.24		
	Number of Species				17					
	Number of Hybrids				1					

River Code: **10-229**	Stream: **Little West Fork**	Sample Date: **2007**
River Mile: **0.10**	Location: Buck Run Rd.	Date Range: 07/10/2007
Time Fished: 3069 sec	Drainage: 22.5 sq mi	Thru: 08/07/2007
Dist Fished: 0.36 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback	C	O	M		2	1.67	0.10	0.01	0.10	3.00
Black Redhorse	R	I	S	I	1	0.83	0.05	0.06	1.15	66.00
Golden Redhorse	R	I	S	M	44	36.67	2.21	0.25	5.29	6.86
Northern Hog Sucker	R	I	S	M	38	31.67	1.90	0.31	6.51	9.80
White Sucker	W	O	S	T	128	106.67	6.42	0.15	3.22	1.44
Common Carp	G	O	M	T	12	10.00	0.60	0.07	1.45	6.91
Creek Chub	N	G	N	T	86	71.67	4.31	0.61	12.80	8.51
Silver Shiner	N	I	S	I	17	14.17	0.85	0.04	0.86	2.88
Scarlet Shiner	N	I	S	M	28	23.33	1.40	0.05	0.94	1.93
Striped Shiner	N	I	S		83	69.17	4.16	0.22	4.67	3.22
Sand Shiner	N	I	M	M	25	20.83	1.25	0.04	0.86	1.96
Mimic Shiner	N	I	M	I	4	3.33	0.20	0.00	0.07	1.00
Silverjaw Minnow	N	I	M		199	165.83	9.97	0.18	3.76	1.08
Bluntnose Minnow	N	O	C	T	273	227.50	13.68	0.44	9.16	1.92
Central Stoneroller	N	H	N		655	545.83	32.83	0.67	14.07	1.23
Yellow Bullhead		I	C	T	15	12.50	0.75	0.29	6.07	23.13
Rock Bass	S	C	C		2	1.67	0.10	0.09	1.78	51.00
Smallmouth Bass	F	C	C	M	2	1.67	0.10	0.01	0.10	3.00
Largemouth Bass	F	C	C		1	0.83	0.05	0.01	0.10	6.00
Green Sunfish	S	I	C	T	11	9.17	0.55	0.14	2.88	14.95
Bluegill Sunfish	S	I	C	P	3	2.50	0.15	0.04	0.82	15.67
Longear Sunfish	S	I	C	M	66	55.00	3.31	0.71	14.81	12.82
Green Sf X Bluegill Sf					1	0.83	0.05	0.02	0.49	28.00
Logperch	D	I	S	M	16	13.33	0.80	0.08	1.74	6.25
Johnny Darter	D	I	C		22	18.33	1.10	0.01	0.26	0.69
Greenside Darter	D	I	S	M	32	26.67	1.60	0.07	1.47	2.63
Banded Darter	D	I	S	I	3	2.50	0.15	0.01	0.15	2.67
Rainbow Darter	D	I	S	M	106	88.33	5.31	0.12	2.58	1.39
Orangethroat Darter	D	I	S		1	0.83	0.05	0.00	0.03	2.00
Fantail Darter	D	I	C		119	99.17	5.96	0.09	1.79	0.86
	Mile Total				1,995	1,662.50		4.77		
	Number of Species				29					
	Number of Hybrids				1					

River Code: **10-230**	Stream: **Elk Fork**	Sample Date: **2007**
River Mile: **1.60**	Location: ford off Tri-County Rd.	Date Range: 07/17/2007
Time Fished: 2321 sec	Drainage: 6.7 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	1	2.00	0.26	0.13	1.66	63.00
Northern Hog Sucker	R	I	S	M	1	2.00	0.26	0.13	1.69	64.00
White Sucker	W	O	S	T	60	120.00	15.35	1.99	26.19	16.57
Creek Chub	N	G	N	T	36	72.00	9.21	0.61	8.05	8.49
Striped Shiner	N	I	S		29	58.00	7.42	0.62	8.22	10.76
Bluntnose Minnow	N	O	C	T	31	62.00	7.93	0.17	2.20	2.70
Central Stoneroller	N	H	N		150	300.00	38.36	1.46	19.24	4.87
Yellow Bullhead		I	C	T	5	10.00	1.28	0.75	9.88	75.00
Green Sunfish	S	I	C	T	44	88.00	11.25	1.20	15.81	13.64
Longear Sunfish	S	I	C	M	14	28.00	3.58	0.45	5.88	15.93
Johnny Darter	D	I	C		1	2.00	0.26	0.00	0.03	1.00
Greenside Darter	D	I	S	M	2	4.00	0.51	0.01	0.11	2.00
Rainbow Darter	D	I	S	M	14	28.00	3.58	0.06	0.79	2.14
Orangethroat Darter	D	I	S		3	6.00	0.77	0.02	0.26	3.33
	Mile Total				391	782.00		7.59		
	Number of Species				14					
	Number of Hybrids				0					

River Code: **10-233**	Stream: **Elm Run**	Sample Date: **2007**
River Mile: **1.80**	Location: Deadfall Rd.	Date Range: 08/08/2007
Time Fished: 933 sec	Drainage: 6.1 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Black Redhorse	R	I	S	I	2	4.00	0.17	0.12	1.04	30.00
Golden Redhorse	R	I	S	M	5	10.00	0.43	0.13	1.16	13.40
Northern Hog Sucker	R	I	S	M	7	14.00	0.61	0.12	1.01	8.29
White Sucker	W	O	S	T	132	264.00	11.43	2.90	25.20	10.98
Western Blacknose Dace	N	G	S	T	1	2.00	0.09	0.00	0.03	2.00
Creek Chub	N	G	N	T	193	386.00	16.71	2.61	22.66	6.76
South. Redbelly Dace	N	H	S		3	6.00	0.26	0.01	0.10	2.00
Scarlet Shiner	N	I	S	M	21	42.00	1.82	0.08	0.73	2.00
Striped Shiner	N	I	S		179	358.00	15.50	2.16	18.79	6.04
Silverjaw Minnow	N	I	M		35	70.00	3.03	0.10	0.87	1.43
Bluntnose Minnow	N	O	C	T	191	382.00	16.54	0.72	6.27	1.89
Central Stoneroller	N	H	N		161	322.00	13.94	1.23	10.67	3.81
Green Sunfish	S	I	C	T	4	8.00	0.35	0.33	2.85	41.00
Bluegill Sunfish	S	I	C	P	13	26.00	1.13	0.22	1.91	8.46
Longear Sunfish	S	I	C	M	4	8.00	0.35	0.17	1.48	21.25
Green Sf X Hybrid					2	4.00	0.17	0.16	1.43	41.00
Johnny Darter	D	I	C		1	2.00	0.09	0.00	0.02	1.00
Greenside Darter	D	I	S	M	9	18.00	0.78	0.04	0.33	2.11
Rainbow Darter	D	I	S	M	80	160.00	6.93	0.16	1.43	1.03
Orangethroat Darter	D	I	S		20	40.00	1.73	0.03	0.25	0.74
Fantail Darter	D	I	C		92	184.00	7.97	0.20	1.76	1.10
	Mile Total				1,155	2,310.00		11.51		
	Number of Species				20					
	Number of Hybrids				1					

River Code: **10-234**	Stream: **Elk Run**	Sample Date: **2007**
River Mile: **1.40**	Location: upst. Elm Run	Date Range: 07/31/2007
Time Fished: 1560 sec	Drainage: 5.2 sq mi	
Dist Fished: 0.16 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Black Redhorse	R	I	S	I	1	1.88	0.09	0.03	0.24	16.00
Golden Redhorse	R	I	S	M	3	5.63	0.26	0.06	0.45	10.00
Northern Hog Sucker	R	I	S	M	4	7.50	0.35	0.15	1.23	20.50
White Sucker	W	O	S	T	61	114.38	5.35	0.65	5.16	5.65
Western Blacknose Dace	N	G	S	T	9	16.88	0.79	0.04	0.30	2.22
Creek Chub	N	G	N	T	127	238.13	11.13	3.49	27.85	14.63
South. Redbelly Dace	N	H	S		7	13.13	0.61	0.02	0.15	1.43
Scarlet Shiner	N	I	S	M	32	60.00	2.80	0.12	0.96	2.00
Striped Shiner	N	I	S		139	260.63	12.18	1.32	10.56	5.07
Sand Shiner	N	I	M	M	3	5.63	0.26	0.01	0.06	1.33
Silverjaw Minnow	N	I	M		10	18.75	0.88	0.06	0.45	3.00
Bluntnose Minnow	N	O	C	T	177	331.88	15.51	1.15	9.16	3.45
Central Stoneroller	N	H	N		264	495.00	23.14	2.62	20.95	5.30
Yellow Bullhead		I	C	T	1	1.88	0.09	0.02	0.18	12.00
Rock Bass	S	C	C		3	5.63	0.26	0.23	1.80	40.00
Smallmouth Bass	F	C	C	M	5	9.38	0.44	0.55	4.40	58.80
Green Sunfish	S	I	C	T	20	37.50	1.75	0.79	6.32	21.10
Bluegill Sunfish	S	I	C	P	38	71.25	3.33	0.48	3.80	6.68
Longear Sunfish	S	I	C	M	8	15.00	0.70	0.22	1.75	14.63
Johnny Darter	D	I	C		40	75.00	3.51	0.08	0.60	1.00
Greenside Darter	D	I	S	M	29	54.38	2.54	0.11	0.90	2.07
Rainbow Darter	D	I	S	M	131	245.63	11.48	0.24	1.95	0.99
Orangethroat Darter	D	I	S		4	7.50	0.35	0.01	0.07	1.25
Fantail Darter	D	I	C		25	46.88	2.19	0.09	0.69	1.84
Mile Total					1,141	2,139.38		12.51		
Number of Species					24					
Number of Hybrids					0					

River Code: **10-234**	Stream: **Elk Run**	Sample Date: **2007**
River Mile: **0.80**	Location: dst. Coss Rd.	Date Range: 07/12/2007
Time Fished: 1500 sec	Drainage: 13.9 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	12	24.00	1.78	0.94	9.81	39.17
Northern Hog Sucker	R	I	S	M	21	42.00	3.11	0.56	5.82	13.29
White Sucker	W	O	S	T	70	140.00	10.36	0.26	2.71	1.86
Creek Chub	N	G	N	T	37	74.00	5.47	0.12	1.21	1.57
Scarlet Shiner	N	I	S	M	10	20.00	1.48	0.05	0.51	2.44
Striped Shiner	N	I	S		60	120.00	8.88	0.53	5.55	4.43
Sand Shiner	N	I	M	M	10	20.00	1.48	0.03	0.27	1.30
Silverjaw Minnow	N	I	M		41	82.00	6.07	0.08	0.81	0.95
Bluntnose Minnow	N	O	C	T	105	210.00	15.53	0.48	5.04	2.30
Central Stoneroller	N	H	N		121	242.00	17.90	0.45	4.66	1.85
Rock Bass	S	C	C		8	16.00	1.18	1.44	15.00	89.88
Smallmouth Bass	F	C	C	M	17	34.00	2.51	2.51	26.22	73.90
Green Sunfish	S	I	C	T	8	16.00	1.18	0.40	4.17	25.00
Bluegill Sunfish	S	I	C	P	16	32.00	2.37	0.24	2.45	7.33
Longear Sunfish	S	I	C	M	27	54.00	3.99	1.18	12.32	21.88
Johnny Darter	D	I	C		23	46.00	3.40	0.04	0.42	0.87
Greenside Darter	D	I	S	M	17	34.00	2.51	0.12	1.23	3.47
Rainbow Darter	D	I	S	M	36	72.00	5.33	0.08	0.81	1.08
Orangethroat Darter	D	I	S		8	16.00	1.18	0.03	0.35	2.13
Fantail Darter	D	I	C		29	58.00	4.29	0.06	0.63	1.03
	Mile Total				676	1,352.00		9.59		
	Number of Species				20					
	Number of Hybrids				0					

River Code: **10-237**	Stream: **Lost Fork**	Sample Date: **2007**
River Mile: **2.50**	Location: St. Rt. 247	Date Range: 07/12/2007
Time Fished: 960 sec	Drainage: 5.9 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Golden Redhorse	R	I	S	M	3	6.00	0.47	0.10	2.14	16.33
Northern Hog Sucker	R	I	S	M	6	12.00	0.93	0.04	0.92	3.50
White Sucker	W	O	S	T	67	134.00	10.40	0.24	5.19	1.78
Creek Chub	N	G	N	T	100	200.00	15.53	0.72	15.69	3.60
South. Redbelly Dace	N	H	S		6	12.00	0.93	0.03	0.74	2.83
Scarlet Shiner	N	I	S	M	15	30.00	2.33	0.05	0.98	1.50
Striped Shiner	N	I	S		77	154.00	11.96	0.60	12.99	3.87
Sand Shiner	N	I	M	M	14	28.00	2.17	0.07	1.42	2.33
Silverjaw Minnow	N	I	M		28	56.00	4.35	0.11	2.40	1.96
Bluntnose Minnow	N	O	C	T	77	154.00	11.96	0.32	6.91	2.06
Central Stoneroller	N	H	N		122	244.00	18.94	0.72	15.74	2.96
Green Sunfish	S	I	C	T	7	14.00	1.09	0.32	7.06	23.14
Bluegill Sunfish	S	I	C	P	12	24.00	1.86	0.16	3.47	6.64
Longear Sunfish	S	I	C	M	46	92.00	7.14	0.92	20.10	10.02
Johnny Darter	D	I	C		23	46.00	3.57	0.05	1.00	1.00
Greenside Darter	D	I	S	M	3	6.00	0.47	0.02	0.39	3.00
Rainbow Darter	D	I	S	M	17	34.00	2.64	0.06	1.39	1.88
Orangethroat Darter	D	I	S		7	14.00	1.09	0.03	0.57	1.86
Fantail Darter	D	I	C		14	28.00	2.17	0.04	0.92	1.50
	Mile Total				644	1,288.00		4.59		
	Number of Species				19					
	Number of Hybrids				0					

River Code: **10-237**	Stream: **Lost Fork**	Sample Date: **2007**
River Mile: **1.70**	Location: Peach Orchard Rd.	Date Range: 07/11/2007
Time Fished: 1680 sec	Drainage: 12.2 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Black Redhorse	R	I	S	I	2	3.00	0.36	0.51	1.56	171.00
Golden Redhorse	R	I	S	M	46	69.00	8.21	18.81	57.24	272.67
Northern Hog Sucker	R	I	S	M	13	19.50	2.32	0.71	2.16	36.38
White Sucker	W	O	S	T	21	31.50	3.75	2.22	6.76	70.54
Western Blacknose Dace	N	G	S	T	1	1.50	0.18	0.00	0.01	2.00
Creek Chub	N	G	N	T	20	30.00	3.57	0.13	0.39	4.25
Scarlet Shiner	N	I	S	M	23	34.50	4.11	0.06	0.17	1.65
Striped Shiner	N	I	S		122	183.00	21.79	1.99	6.04	10.85
Spotfin Shiner	N	I	M		2	3.00	0.36	0.02	0.05	5.00
Sand Shiner	N	I	M	M	31	46.50	5.54	0.12	0.37	2.58
Silverjaw Minnow	N	I	M		4	6.00	0.71	0.02	0.07	3.67
Bluntnose Minnow	N	O	C	T	103	154.50	18.39	0.46	1.41	3.00
Central Stoneroller	N	H	N		64	96.00	11.43	0.37	1.13	3.88
Yellow Bullhead		I	C	T	3	4.50	0.54	0.29	0.87	63.33
Rock Bass	S	C	C		8	12.00	1.43	1.24	3.78	103.38
Smallmouth Bass	F	C	C	M	22	33.00	3.93	4.23	12.86	128.07
Green Sunfish	S	I	C	T	14	21.00	2.50	0.51	1.55	24.21
Bluegill Sunfish	S	I	C	P	4	6.00	0.71	0.11	0.34	18.75
Longear Sunfish	S	I	C	M	25	37.50	4.46	0.96	2.93	25.68
Johnny Darter	D	I	C		5	7.50	0.89	0.02	0.05	2.20
Greenside Darter	D	I	S	M	7	10.50	1.25	0.04	0.12	3.71
Rainbow Darter	D	I	S	M	7	10.50	1.25	0.02	0.05	1.57
Orangethroat Darter	D	I	S		1	1.50	0.18	0.00	0.01	2.00
Fantail Darter	D	I	C		12	18.00	2.14	0.03	0.10	1.82
	Mile Total				560	840.00		32.87		
	Number of Species				24					
	Number of Hybrids				0					

River Code: **10-240**	Stream: **Baker Fork**	Sample Date: **2007**
River Mile: **14.80**	Location: Dry Bone Rd.	Date Range: 08/01/2007
Time Fished: 1817 sec	Drainage: 13.3 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	25	50.00	3.49	0.20	3.01	4.00
Western Blacknose Dace	N	G	S	T	9	18.00	1.26	0.03	0.42	1.56
Creek Chub	N	G	N	T	104	208.00	14.50	2.29	34.43	11.00
Scarlet Shiner	N	I	S	M	6	12.00	0.84	0.02	0.33	1.83
Striped Shiner	N	I	S		26	52.00	3.63	0.38	5.78	7.38
Sand Shiner	N	I	M	M	105	210.00	14.64	0.29	4.39	1.39
Silverjaw Minnow	N	I	M		76	152.00	10.60	0.49	7.34	3.21
Bluntnose Minnow	N	O	C	T	128	256.00	17.85	0.46	6.89	1.79
Central Stoneroller	N	H	N		2	4.00	0.28	0.02	0.33	5.50
Yellow Bullhead		I	C	T	5	10.00	0.70	0.11	1.69	11.20
Rock Bass	S	C	C		1	2.00	0.14	0.01	0.09	3.00
Green Sunfish	S	I	C	T	34	68.00	4.74	1.13	17.05	16.67
Longear Sunfish	S	I	C	M	114	228.00	15.90	0.92	13.91	4.05
Green Sf X Bluegill Sf					1	2.00	0.14	0.01	0.21	7.00
Johnny Darter	D	I	C		16	32.00	2.23	0.05	0.81	1.69
Greenside Darter	D	I	S	M	54	108.00	7.53	0.16	2.47	1.52
Rainbow Darter	D	I	S	M	8	16.00	1.12	0.04	0.65	2.71
Orangethroat Darter	D	I	S		2	4.00	0.28	0.01	0.12	2.00
Fantail Darter	D	I	C		1	2.00	0.14	0.00	0.06	2.00
	Mile Total				717	1,434.00		6.65		
	Number of Species				18					
	Number of Hybrids				1					

River Code: **10-240**	Stream: **Baker Fork**	Sample Date: **2007**
River Mile: **10.50**	Location: Fort Hill Rd.	Date Range: 07/26/2007
Time Fished: 3619 sec	Drainage: 21.0 sq mi	Thru: 08/16/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Black Redhorse	R	I	S	I	20	15.00	1.33	1.15	7.90	76.90
Golden Redhorse	R	I	S	M	12	9.00	0.80	0.68	4.62	75.00
Northern Hog Sucker	R	I	S	M	96	72.00	6.40	2.63	18.04	36.59
White Sucker	W	O	S	T	54	40.50	3.60	3.10	21.23	76.55
Creek Chub	N	G	N	T	105	78.75	7.00	0.31	2.11	3.91
Silver Shiner	N	I	S	I	7	5.25	0.47	0.01	0.08	2.14
Scarlet Shiner	N	I	S	M	46	34.50	3.07	0.07	0.48	2.02
Striped Shiner	N	I	S		167	125.25	11.13	0.66	4.52	5.27
Sand Shiner	N	I	M	M	3	2.25	0.20	0.01	0.04	2.33
Silverjaw Minnow	N	I	M		38	28.50	2.53	0.06	0.43	2.22
Bluntnose Minnow	N	O	C	T	128	96.00	8.53	0.22	1.49	2.26
Central Stoneroller	N	H	N		311	233.25	20.73	0.64	4.37	2.73
Trout-perch		I	M		30	22.50	2.00	0.05	0.34	2.17
Rock Bass	S	C	C		23	17.25	1.53	1.08	7.37	62.34
Smallmouth Bass	F	C	C	M	22	16.50	1.47	1.35	9.25	81.82
Spotted Bass	F	C	C		2	1.50	0.13	0.02	0.10	10.00
Largemouth Bass	F	C	C		2	1.50	0.13	0.19	1.32	128.50
Green Sunfish	S	I	C	T	21	15.75	1.40	0.50	3.41	31.62
Bluegill Sunfish	S	I	C	P	3	2.25	0.20	0.01	0.10	6.33
Longear Sunfish	S	I	C	M	128	96.00	8.53	1.62	11.08	16.85
Blackside Darter	D	I	S		1	0.75	0.07	0.01	0.04	7.00
Logperch	D	I	S	M	7	5.25	0.47	0.05	0.36	10.00
Johnny Darter	D	I	C		112	84.00	7.47	0.06	0.40	0.70
Greenside Darter	D	I	S	M	67	50.25	4.47	0.07	0.50	1.44
Banded Darter	D	I	S	I	1	0.75	0.07	0.00	0.01	1.00
Rainbow Darter	D	I	S	M	49	36.75	3.27	0.03	0.18	0.72
Fantail Darter	D	I	C		45	33.75	3.00	0.04	0.27	1.18
	Mile Total				1,500	1,125.00		14.60		
	Number of Species				27					
	Number of Hybrids				0					

River Code: **10-240**	Stream: **Baker Fork**	Sample Date: **2007**
River Mile: **1.50**	Location: Horner Chapel Rd.	Date Range: 07/31/2007
Time Fished: 4461 sec	Drainage: 42.4 sq mi	Thru: 08/21/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Black Redhorse	R	I	S	I	38	28.50	1.59	3.03	18.08	106.22
Golden Redhorse	R	I	S	M	109	81.75	4.55	2.34	13.98	28.62
Northern Hog Sucker	R	I	S	M	90	67.50	3.75	1.45	8.63	21.41
White Sucker	W	O	S	T	42	31.50	1.75	0.39	2.32	12.31
Spotted Sucker	R	I	S		2	1.50	0.08	0.00	0.03	3.00
Creek Chub	N	G	N	T	36	27.00	1.50	0.18	1.08	6.69
Silver Shiner	N	I	S	I	45	33.75	1.88	0.04	0.21	1.04
Scarlet Shiner	N	I	S	M	74	55.50	3.09	0.06	0.38	1.15
Striped Shiner	N	I	S		390	292.50	16.27	1.78	10.64	6.09
Steelcolor Shiner	N	I	M	P	1	0.75	0.04	0.00	0.01	2.00
Spotfin Shiner	N	I	M		8	6.00	0.33	0.01	0.08	2.13
Sand Shiner	N	I	M	M	132	99.00	5.51	0.19	1.14	1.92
Mimic Shiner	N	I	M	I	14	10.50	0.58	0.03	0.17	2.71
Ghost Shiner	N	I	M		1	0.75	0.04	0.00	0.01	1.00
Silverjaw Minnow	N	I	M		66	49.50	2.75	0.11	0.67	2.27
Bluntnose Minnow	N	O	C	T	372	279.00	15.52	0.71	4.25	2.55
Central Stoneroller	N	H	N		301	225.75	12.56	1.29	7.69	5.71
Yellow Bullhead		I	C	T	2	1.50	0.08	0.24	1.43	160.00
Brindled Madtom		I	C	I	5	3.75	0.21	0.02	0.14	6.40
Brook Silverside		I	M	M	9	6.75	0.38	0.01	0.05	1.22
Rock Bass	S	C	C		32	24.00	1.34	1.10	6.58	45.90
Smallmouth Bass	F	C	C	M	37	27.75	1.54	1.51	9.04	54.55
Spotted Bass	F	C	C		8	6.00	0.33	0.34	2.02	56.50
Green Sunfish	S	I	C	T	4	3.00	0.17	0.07	0.40	22.50
Bluegill Sunfish	S	I	C	P	2	1.50	0.08	0.02	0.09	10.00
Longear Sunfish	S	I	C	M	89	66.75	3.71	1.05	6.26	15.69
Blackside Darter	D	I	S		24	18.00	1.00	0.06	0.38	3.50
Logperch	D	I	S	M	60	45.00	2.50	0.28	1.68	6.27
Johnny Darter	D	I	C		73	54.75	3.05	0.04	0.22	0.68
Greenside Darter	D	I	S	M	115	86.25	4.80	0.20	1.18	2.28
Banded Darter	D	I	S	I	10	7.50	0.42	0.01	0.07	1.60
Rainbow Darter	D	I	S	M	169	126.75	7.05	0.16	0.94	1.24
Fantail Darter	D	I	C		37	27.75	1.54	0.03	0.15	0.92
	Mile Total				2,397	1,797.75		16.74		
	Number of Species				33					
	Number of Hybrids				0					

River Code: **10-241**	Stream: **Middle Fork Baker Fork**	Sample Date: **2007**
River Mile: **5.40**	Location: lane dst. Sinking Spring Rd.	Date Range: 07/31/2007
Time Fished: 2404 sec	Drainage: 9.8 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Black Redhorse	R	I	S	I	37	55.50	4.01	8.33	25.73	150.00
Golden Redhorse	R	I	S	M	4	6.00	0.43	0.05	0.14	7.50
Northern Hog Sucker	R	I	S	M	42	63.00	4.56	2.59	8.00	41.07
White Sucker	W	O	S	T	40	60.00	4.34	2.55	7.87	42.43
Western Blacknose Dace	N	G	S	T	1	1.50	0.11	0.00	0.01	2.00
Creek Chub	N	G	N	T	47	70.50	5.10	1.35	4.17	19.15
Silver Shiner	N	I	S	I	33	49.50	3.58	0.08	0.26	1.70
Scarlet Shiner	N	I	S	M	15	22.50	1.63	0.06	0.18	2.57
Striped Shiner	N	I	S		118	177.00	12.80	1.99	6.15	11.23
Silverjaw Minnow	N	I	M		20	30.00	2.17	0.08	0.25	2.65
Bluntnose Minnow	N	O	C	T	55	82.50	5.97	0.21	0.64	2.51
Central Stoneroller	N	H	N		109	163.50	11.82	1.30	4.02	7.94
Yellow Bullhead		I	C	T	4	6.00	0.43	0.68	2.09	112.50
Rock Bass	S	C	C		41	61.50	4.45	2.76	8.53	44.88
Smallmouth Bass	F	C	C	M	38	57.00	4.12	6.16	19.03	108.00
Green Sunfish	S	I	C	T	22	33.00	2.39	1.13	3.49	34.23
Bluegill Sunfish	S	I	C	P	2	3.00	0.22	0.05	0.17	18.00
Longear Sunfish	S	I	C	M	54	81.00	5.86	2.57	7.94	31.70
Green Sf X Bluegill Sf					1	1.50	0.11	0.01	0.03	6.00
Johnny Darter	D	I	C		64	96.00	6.94	0.06	0.19	0.63
Greenside Darter	D	I	S	M	28	42.00	3.04	0.12	0.37	2.82
Rainbow Darter	D	I	S	M	105	157.50	11.39	0.17	0.53	1.09
Orangethroat Darter	D	I	S		6	9.00	0.65	0.01	0.04	1.50
Fantail Darter	D	I	C		36	54.00	3.90	0.06	0.19	1.17
	Mile Total				922	1,383.00		32.35		
	Number of Species				23					
	Number of Hybrids				1					

River Code: **10-241**	Stream: **Middle Fork Baker Fork**	Sample Date: **2007**
River Mile: **0.30**	Location: Strait Creek Rd.	Date Range: 07/31/2007
Time Fished: 3013 sec	Drainage: 20.3 sq mi	Thru: 08/20/2007
Dist Fished: 0.40 km	Basin: Southwest Ohio River Tribs No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Black Redhorse	R	I	S	I	11	8.25	0.76	0.08	0.91	9.64
Golden Redhorse	R	I	S	M	33	24.75	2.27	0.09	1.00	3.52
Northern Hog Sucker	R	I	S	M	47	35.25	3.24	0.86	9.85	24.38
White Sucker	W	O	S	T	25	18.75	1.72	0.29	3.33	15.50
Creek Chub	N	G	N	T	107	80.25	7.37	0.88	10.11	10.99
Silver Shiner	N	I	S	I	64	48.00	4.41	0.04	0.41	0.74
Scarlet Shiner	N	I	S	M	76	57.00	5.23	0.08	0.96	1.46
Striped Shiner	N	I	S		189	141.75	13.02	1.52	17.40	10.71
Spotfin Shiner	N	I	M		1	0.75	0.07	0.00	0.02	2.00
Sand Shiner	N	I	M	M	1	0.75	0.07	0.00	0.02	2.00
Silverjaw Minnow	N	I	M		12	9.00	0.83	0.01	0.11	1.08
Bluntnose Minnow	N	O	C	T	157	117.75	10.81	0.33	3.72	2.76
Central Stoneroller	N	H	N		226	169.50	15.56	0.90	10.27	5.29
Yellow Bullhead		I	C	T	7	5.25	0.48	0.64	7.28	121.00
Stonecat Madtom		I	C	I	1	0.75	0.07	0.04	0.44	51.00
Brook Silverside		I	M	M	2	1.50	0.14	0.00	0.03	1.50
Rock Bass	S	C	C		17	12.75	1.17	0.61	7.00	47.88
Smallmouth Bass	F	C	C	M	43	32.25	2.96	0.97	11.13	30.10
Green Sunfish	S	I	C	T	9	6.75	0.62	0.16	1.86	24.00
Bluegill Sunfish	S	I	C	P	12	9.00	0.83	0.10	1.12	10.83
Longear Sunfish	S	I	C	M	25	18.75	1.72	0.35	4.00	18.64
Green Sf X Longear Sf					1	0.75	0.07	0.08	0.96	112.00
Green Sf X Hybrid					1	0.75	0.07	0.08	0.95	110.00
Blackside Darter	D	I	S		9	6.75	0.62	0.05	0.53	6.78
Logperch	D	I	S	M	32	24.00	2.20	0.21	2.37	8.63
Johnny Darter	D	I	C		21	15.75	1.45	0.01	0.16	0.90
Greenside Darter	D	I	S	M	50	37.50	3.44	0.11	1.27	2.95
Rainbow Darter	D	I	S	M	178	133.50	12.26	0.14	1.55	1.01
Orangethroat Darter	D	I	S		2	1.50	0.14	0.00	0.03	1.50
Fantail Darter	D	I	C		93	69.75	6.40	0.11	1.27	1.59
	Mile Total				1,452	1,089.00		8.73		
	Number of Species				28					
	Number of Hybrids				2					

River Code: **10-245**	Stream: **Strait Creek**	Sample Date: **2007**
River Mile: **0.80**	Location: Strait Creek Rd.	Date Range: 07/24/2007
Time Fished: 2397 sec	Drainage: 5.9 sq mi	
Dist Fished: 0.20 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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
Black Redhorse	R	I	S	I	1	1.50	0.16	0.03	0.42	19.00
Golden Redhorse	R	I	S	M	7	10.50	1.10	0.07	0.95	6.29
Northern Hog Sucker	R	I	S	M	46	69.00	7.21	0.25	3.56	3.60
White Sucker	W	O	S	T	6	9.00	0.94	0.05	0.69	5.33
Western Blacknose Dace	N	G	S	T	32	48.00	5.02	0.08	1.18	1.71
Creek Chub	N	G	N	T	110	165.00	17.24	0.98	14.05	5.94
South. Redbelly Dace	N	H	S		1	1.50	0.16	0.00	0.04	2.00
Scarlet Shiner	N	I	S	M	2	3.00	0.31	0.01	0.09	2.00
Striped Shiner	N	I	S		71	106.50	11.13	0.90	12.91	8.45
Silverjaw Minnow	N	I	M		11	16.50	1.72	0.04	0.56	2.36
Bluntnose Minnow	N	O	C	T	20	30.00	3.13	0.08	1.10	2.58
Central Stoneroller	N	H	N		83	124.50	13.01	0.40	5.72	3.21
Rock Bass	S	C	C		2	3.00	0.31	0.07	1.03	24.00
Smallmouth Bass	F	C	C	M	6	9.00	0.94	2.10	30.12	233.33
Green Sunfish	S	I	C	T	10	15.00	1.57	0.60	8.60	40.00
Bluegill Sunfish	S	I	C	P	35	52.50	5.49	0.46	6.54	8.69
Longear Sunfish	S	I	C	M	15	22.50	2.35	0.53	7.53	23.33
Blackside Darter	D	I	S		10	15.00	1.57	0.04	0.50	2.30
Logperch	D	I	S	M	2	3.00	0.31	0.04	0.52	12.00
Johnny Darter	D	I	C		8	12.00	1.25	0.01	0.13	0.75
Greenside Darter	D	I	S	M	49	73.50	7.68	0.12	1.71	1.63
Banded Darter	D	I	S	I	1	1.50	0.16	0.00	0.04	2.00
Rainbow Darter	D	I	S	M	62	93.00	9.72	0.09	1.22	0.91
Fantail Darter	D	I	C		48	72.00	7.52	0.06	0.80	0.78
	Mile Total				638	957.00		6.97		
	Number of Species				24					
	Number of Hybrids				0					

River Code: **10-246**	Stream: **Muddy Fork**	Sample Date: **2007**
River Mile: **0.40**	Location: Frost Rd.	Date Range: 08/01/2007
Time Fished: 1421 sec	Drainage: 6.1 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	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	39	78.00	4.02	0.44	5.60	5.59
Western Blacknose Dace	N	G	S	T	47	94.00	4.84	0.20	2.62	2.17
Creek Chub	N	G	N	T	226	452.00	23.27	3.05	39.20	6.76
Scarlet Shiner	N	I	S	M	2	4.00	0.21	0.02	0.31	6.00
Striped Shiner	N	I	S		25	50.00	2.57	0.18	2.36	3.68
Sand Shiner	N	I	M	M	34	68.00	3.50	0.16	2.11	2.41
Silverjaw Minnow	N	I	M		114	228.00	11.74	0.71	9.11	3.12
Bluntnose Minnow	N	O	C	T	149	298.00	15.35	0.70	9.01	2.36
Central Stoneroller	N	H	N		52	104.00	5.36	0.64	8.27	6.19
Yellow Bullhead		I	C	T	2	4.00	0.21	0.15	1.90	37.00
Rock Bass	S	C	C		1	2.00	0.10	0.01	0.10	4.00
Green Sunfish	S	I	C	T	6	12.00	0.62	0.10	1.34	8.67
Longear Sunfish	S	I	C	M	54	108.00	5.56	0.71	9.15	6.60
Johnny Darter	D	I	C		149	298.00	15.35	0.28	3.65	0.95
Greenside Darter	D	I	S	M	43	86.00	4.43	0.27	3.44	3.12
Rainbow Darter	D	I	S	M	20	40.00	2.06	0.10	1.31	2.56
Fantail Darter	D	I	C		8	16.00	0.82	0.04	0.51	2.50
	Mile Total				971	1,942.00		7.79		
	Number of Species				17					
	Number of Hybrids				0					

River Code: **10-248**	Stream: **Shimer Run**	Sample Date: **2007**
River Mile: **0.10**	Location: at mouth	Date Range: 07/18/2007
Time Fished: 1759 sec	Drainage: 5.9 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	12	24.00	4.88	0.64	19.13	26.83
White Sucker	W	O	S	T	2	4.00	0.81	0.00	0.12	1.00
Western Blacknose Dace	N	G	S	T	1	2.00	0.41	0.00	0.12	2.00
Creek Chub	N	G	N	T	29	58.00	11.79	0.36	10.81	6.28
Striped Shiner	N	I	S		78	156.00	31.71	1.16	34.33	7.41
Silverjaw Minnow	N	I	M		4	8.00	1.63	0.03	0.83	3.50
Bluntnose Minnow	N	O	C	T	11	22.00	4.47	0.06	1.66	2.55
Central Stoneroller	N	H	N		29	58.00	11.79	0.40	11.88	6.90
Yellow Bullhead		I	C	T	1	2.00	0.41	0.04	1.19	20.00
Stonecat Madtom		I	C	I	1	2.00	0.41	0.10	2.91	49.00
Rock Bass	S	C	C		3	6.00	1.22	0.37	10.87	61.00
Smallmouth Bass	F	C	C	M	4	8.00	1.63	0.04	1.13	4.75
Longear Sunfish	S	I	C	M	1	2.00	0.41	0.01	0.24	4.00
Johnny Darter	D	I	C		10	20.00	4.07	0.02	0.53	0.89
Greenside Darter	D	I	S	M	13	26.00	5.28	0.05	1.37	1.75
Banded Darter	D	I	S	I	1	2.00	0.41	0.00	0.06	1.00
Rainbow Darter	D	I	S	M	46	92.00	18.70	0.10	2.85	1.04
	Mile Total				246	492.00		3.37		
	Number of Species				17					
	Number of Hybrids				0					

River Code: **10-252**	Stream: **Trib. to Beasley Fork (RM 4.60)**	Sample Date: **2007**
River Mile: **0.20**	Location: St. Rt. 247	Date Range: 08/08/2007
Time Fished: 1468 sec	Drainage: 4.9 sq mi	
Dist Fished: 0.15 km	Basin: Southwest Ohio River Tribs No of Passes: 1	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	1	2.00	0.08	0.01	0.08	3.00
White Sucker	W	O	S	T	81	162.00	6.20	0.19	2.60	1.15
Creek Chub	N	G	N	T	186	372.00	14.23	2.40	33.43	6.45
Striped Shiner	N	I	S		16	32.00	1.22	0.04	0.61	1.38
Silverjaw Minnow	N	I	M		8	16.00	0.61	0.03	0.45	2.00
Bluntnose Minnow	N	O	C	T	35	70.00	2.68	0.16	2.17	2.23
Central Stoneroller	N	H	N		701	1,402.00	53.63	3.52	49.06	2.51
Yellow Bullhead		I	C	T	7	14.00	0.54	0.04	0.53	2.71
Green Sunfish	S	I	C	T	4	8.00	0.31	0.02	0.31	2.75
Longear Sunfish	S	I	C	M	3	6.00	0.23	0.12	1.73	20.67
Johnny Darter	D	I	C		26	52.00	1.99	0.04	0.61	0.85
Rainbow Darter	D	I	S	M	53	106.00	4.06	0.13	1.78	1.21
Fantail Darter	D	I	C		186	372.00	14.23	0.48	6.63	1.28
	Mile Total				1,307	2,614.00		7.18		
	Number of Species				13					
	Number of Hybrids				0					

Appendix Table 8. Primary macrobenthos index, ICI, and associated community metrics, Ohio Brush Creek basin, 2007.

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 Organisms	Qual. EPT	Eco-region	ICI
Ohio Brush Creek (10-200)													
Year: 2007													
30.40	174.0	53(6)	7(4)	1(2)	27(6)	24.5(4)	0.7(2)	12.2(2)	60.7(0)	2.7(6)	28(6)	2	38
24.80	315.0	44(6)	10(6)	5(6)	18(6)	19.6(4)	5.2(2)	5.0(2)	68.3(0)	0.0(6)	24(6)	2	44
10.00	396.0	47(6)	9(6)	7(6)	17(6)	20.0(4)	9.1(2)	1.6(2)	66.3(0)	0.0(6)	25(6)	2	44
6.00	423.0	38(6)	9(6)	5(4)	14(4)	40.8(6)	26.4(4)	1.9(2)	29.2(4)	0.2(6)	22(6)	2	48
0.50	435.0	21(2)	1(0)	4(4)	6(2)	0.3(2)	3.7(2)	0.0(0)	95.8(0)	8.9(0)	1(0)	2	12
Baker Fork (10-240)													
Year: 2007													
10.50 B	21.0	41(6)	6(4)	2(4)	21(6)	49.3(6)	0.5(2)	17.6(4)	31.6(4)	2.9(6)	14(6)	2	48

Appendix Table 9. Macroinvertebrate summary statistics, Ohio Brush Creek basin, 2007.

River Mile	All Taxa			Sen. Taxa			EPT Taxa		CW Taxa	Ql. Tol. Taxa	Ql. S T	QCTV	ICI	Nar.	Drain	Comments
	Total	Qt.	Ql.	Total	Qt.	Ql.	Total	Ql.								
Ohio Brush Creek (10-200)																
Year: 2007																
54.70	57		57	15		15		14	0	9	1.67	38.9		G	8.7	
52.50	55		55	19		19		17	0	9	2.11	39.2		VG	26.0	
47.16	51		51	25		25		20	0	3	8.33	42.1		E	52.4	
44.90	32		32	11		11		9	0	5	2.20	38.0		MG	55.0	X9
39.00	72		72	36		36		24	0	5	7.20	40.6		E	136.0	
30.40	101	53	76	50	22	39	29	28	0	8	4.88	42.5	38	E	174.0	X15
24.80	81	44	56	40	22	27	28	24	1	6	4.50	42.5	44		315.0	
21.35	75		75	37		37		23	0	7	5.29	40.5		E	328.0	
15.20	64		64	35		35		27	0	4	8.75	43.1		E	371.0	
10.00	83	47	66	44	27	35	29	25	0	3	11.67	42.7	44		396.0	
6.00	74	38	61	43	23	35	26	22	0	1	35.00	42.5	48		423.0	X15
0.50	39	21	25	4	1	3	5	1	0	7	0.43	34.3	12		435.0	X2,15
Beasley Fork (10-205)																
Year: 2007																
4.70	30		30	7		7		9	0	4	1.75	39.9		MG	3.4	
3.20	31		31	11		11		14	0	4	2.75	42.7		G	9.7	
0.75	37		37	14		14		14	0	5	2.80	42.3		G	18.0	
Moore Run (10-206)																
Year: 2007																
0.40	27		27	7		7		10	0	3	2.33	39.6		MG	3.8	
Cedar Run (10-209)																
Year: 2007																
0.38	47		47	25		25		24	1	3	8.33	43.5		E	11.1	
Lick Fork (10-211)																
Year: 2007																
4.30	32		32	6		6		8	0	6	1.00	35.3		F	7.9	
1.03	41		41	18		18		13	0	6	3.00	39.9		G	30.9	
Treber Run (10-212)																
Year: 2007																
0.10	33		33	9		9		8	1	4	2.25	38.9		MG	7.2	X9
Cave Run (10-213)																
Year: 2007																
0.10	28		28	11		11		12	2	3	3.67	42.7		G	3.8	X9
Trib. to Lick Fork (RM 4.02) (10-215)																
Year: 2007																
2.80	20		20	2		2		1	1	11	0.18	24.8			2.7	X9
0.20	32		32	5		5		6	1	7	0.71	37.6		F	8.3	X9
Little East Fork (10-216)																

Appendix Table 9. Macroinvertebrate summary statistics, Ohio Brush Creek basin, 2007.

River Mile	All Taxa Total	All Taxa Qt.	All Taxa Ql.	Sen. Taxa Total	Sen. Taxa Qt.	Sen. Taxa Ql.	EPT Taxa Total	EPT Taxa Ql.	CW Taxa	Ql. Tol. Taxa	Ql. S/T	QCTV	ICI	Nar.	Drain	Comments
Year: 2007																
0.90	27		27	7		7		6	0	6	1.17	36.8		F	6.9	
0.40	17		17	5		5		7	0	2	2.50	41.8		F	10.1	X9
Crooked Creek (10-218)																
Year: 2007																
2.20	37		37	8		8		6	0	7	1.14	34.3		F	8.3	X9
West Fork Ohio Brush Creek (10-220)																
Year: 2007																
20.53	22		22	1		1		3	0	7	0.14	30.0		P	4.8	X9
17.92	49		49	13		13		7	0	8	1.63	35.6		F	12.0	
15.20	51		51	16		16		13	0	7	2.29	39.1		G	22.7	
12.74	48		48	15		15		15	0	9	1.67	38.0		G	27.3	
10.50	40		40	17		17		14	0	4	4.25	39.6		G	38.9	
6.10	54		54	13		13		12	0	11	1.18	36.1		MG	76.0	
1.10	49		49	16		16		13	0	8	2.00	38.0		G	129.0	
Georges Creek (10-222)																
Year: 2007																
3.80	35		35	7		7		6	0	9	0.78	36.8		F	5.9	
0.10	32		32	8		8		8	0	6	1.33	38.9		F	12.3	
Cherry Fork (10-224)																
Year: 2007																
8.74	27		27	2		2		4	0	11	0.18	28.1		LF	5.7	X9
7.50	25		25	6		6		4	0	5	1.20	33.7		F	9.8	X9
2.61	41		41	8		8		10	0	5	1.60	37.6		F	20.3	X9
Grace Run (10-225)																
Year: 2007																
1.40	30		30	3		3		6	0	11	0.27	31.8		F	6.3	
Buck Run (10-228)																
Year: 2007																
0.38	44		44	11		11		9	0	9	1.22	37.5		MG	10.7	
Little West Fork (10-229)																
Year: 2007																
6.26	50		50	10		10		10	0	13	0.77	33.7		F	5.5	X9
5.70	43		43	8		8		8	0	7	1.14	34.7		F	9.2	X9
0.10	30		30	7		7		7	0	7	1.00	35.6		F	22.5	X9
Elk Fork (10-230)																
Year: 2007																
1.61	34		34	3		3		5	1	10	0.30	33.1		F	6.7	
Elm Run (10-233)																
Year: 2007																
0.60	39		39	8		8		7	0	8	1.00	34.3		F	7.4	X9

Appendix Table 9. Macroinvertebrate summary statistics, Ohio Brush Creek basin, 2007.

River Mile	All Taxa			Sen. Taxa			EPT Taxa		CW	Ql. Tol.	Ql. S					
	Total	Qt.	Ql.	Total	Qt.	Ql.	Total	Ql.	Taxa	Taxa	T	QCTV	ICI	Nar.	Drain	Comments
Elk Run (10-234)																
Year: 2007																
1.50	61		61	24		24		18	1	8	3.00	39.6		E	5.2	
0.90	48		48	18		18		14	0	5	3.60	39.1		G	13.9	
Lost Fork (10-237)																
Year: 2007																
2.50	33		33	6		6		6	0	6	1.00	36.8		F	5.9	X9
1.70	38		38	14		14		14	0	7	2.00	39.6		G	12.2	
Baker Fork (10-240)																
Year: 2007																
14.80	45		45	12		12		8	1	5	2.40	38.4		MG	12.8	
10.50 A	60		60	26		26		17	1	8	3.25	41.0			21.0	
10.50 B	67	41	50	31	19	26	15	14	0	5	5.20	42.1	48		21.0	X15
1.49	59		59	27		27		17	0	9	3.00	41.0		E	0.0	
Middle Fork Baker Fork (10-241)																
Year: 2007																
5.40	57		57	18		18		18	1	6	3.00	39.2		VG	9.8	
0.30	47		47	19		19		14	0	7	2.71	39.6		G	20.3	X9
Strait Creek (10-245)																
Year: 2007																
0.60	47		47	24		24		14	4	2	12.00	42.6		E	5.9	
Muddy Fork (10-246)																
Year: 2007																
0.39	45		45	9		9		7	0	7	1.29	36.8		F	6.1	
Shimer Run (10-248)																
Year: 2007																
0.10	36		36	14		14		13	1	5	2.80	39.6		G	5.9	
Trib. to Beasley Fork (RM 4.60) (10-252)																
Year: 2007																
0.17	34		34	9		9		12	0	5	1.80	39.9		G	4.9	

Table 10. Macrobenthos taxa list, by station, Ohio Brush Creek basin, 2007

Site: Ohio Brush Creek
Deadfall Rd.

Collection Date: 07/26/2007 River Code: 10-200 RM: 54.70

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
08200	*Orconectes sp*	+
08601	*Hydrachnidia*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
25510	*Stylogomphus albistylus*	+
26600	*Didymops transversa*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52530	*Hydropsyche depravata group*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
63900	*Laccophilus sp*	+
65700	*Anacaena sp*	+
66200	*Cymbiodyta sp*	+
67500	*Laccobius sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
69713	*Lutrochus laticeps*	+
69930	*Lampyridae*	+
71300	*Limonia sp*	+
71900	*Tipula sp*	+
74501	*Ceratopogonidae*	+
77355	*Clinotanypus pinguis*	+
77500	*Conchapelopia sp*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
84960	*Pseudochironomus sp*	+
85230	*Cladotanytarsus mancus group*	+
85800	*Tanytarsus sp*	+
85821	*Tanytarsus glabrescens group sp 7*	+
95100	*Physella sp*	+
96264	*Planorbella (Pierosoma) pilsbryi*	+
98200	*Pisidium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 57
No. Qualitative Taxa: 57 ICI:
Number of Organisms: 0 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
Peach Orchard Rd.

Collection Date: 07/26/2007 River Code: 10-200 RM: 52.50

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03451	*Urnatella gracilis*	+
03600	*Oligochaeta*	+
06201	*Hyalella azteca*	+
11200	*Callibaetis sp*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
24900	*Gomphus sp*	+
26700	*Macromia sp*	+
27400	*Neurocordulia sp*	+
27600	*Epitheca (Tetragoneuria) sp*	+
28208	*Erythemis simplicicollis*	+
34300	*Neoperla clymene complex*	+
43205	*Nepa apiculata*	+
44501	*Corixidae*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
59740	*Triaenodes perna*	+
60900	*Peltodytes sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69400	*Stenelmis sp*	+
74501	*Ceratopogonidae*	+
77800	*Helopelopia sp*	+
78402	*Natarsia baltimoreus*	+
78655	*Procladius (Holotanypus) sp*	+
82820	*Cryptochironomus sp*	+
83158	*Endochironomus nigricans*	+
83300	*Glyptotendipes (G.) sp*	+
83840	*Microtendipes pedellus group*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84750	*Stictochironomus sp*	+
85500	*Paratanytarsus sp*	+
94400	*Fossaria sp*	+
97601	*Corbicula fluminea*	+
99860	*Lampsilis radiata luteola*	+

No. Quantitative Taxa: 0 Total Taxa: 55
No. Qualitative Taxa: 55 ICI:
Number of Organisms: 0 Qual EPT: 17

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
dst. Elk Run, adj. Sider Rd.

Collection Date: 08/07/2007 River Code: 10-200 RM: 47.16

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11645	*Procloeon sp*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
27307	*Epitheca (Epicordulia) princeps*	+
34130	*Acroneuria frisoni*	+
34300	*Neoperla clymene complex*	+
43300	*Ranatra sp*	+
43570	*Neoplea sp*	+
45300	*Sigara sp*	+
48620	*Nigronia serricornis*	+
50315	*Chimarra obscura*	+
51400	*Nyctiophylax sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
58505	*Helicopsyche borealis*	+
59100	*Ceraclea sp*	+
59500	*Oecetis sp*	+
59740	*Triaenodes perna*	+
60300	*Dineutus sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68601	*Ancyronyx variegata*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69225	*Optioservus fastiditus*	+
69400	*Stenelmis sp*	+
74501	*Ceratopogonidae*	+
77800	*Helopelopia sp*	+
83040	*Dicrotendipes neomodestus*	+
84460	*Polypedilum (P.) fallax group*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
86200	*Tabanus sp*	+
93900	*Elimia sp*	+
97601	*Corbicula fluminea*	+
98600	*Sphaerium sp*	+
99860	*Lampsilis radiata luteola*	+

No. Quantitative Taxa: 0
No. Qualitative Taxa: 51
Number of Organisms: 0

Total Taxa: 51
ICI:
Qual EPT: 20

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
adj. Twp. Rd. 113, upst. ford

Collection Date: 08/07/2007 River Code: 10-200 RM: 44.90

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
43300	*Ranatra sp*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
57400	*Neophylax sp*	+
59120	*Ceraclea flava complex*	+
59724	*Triaenodes injustus*	+
60300	*Dineutus sp*	+
60900	*Peltodytes sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
74501	*Ceratopogonidae*	+
77115	*Ablabesmyia janta*	+
78655	*Procladius (Holotanypus) sp*	+
82885	*Cryptotendipes pseudotener*	+
84470	*Polypedilum (P.) illinoense*	+
84750	*Stictochironomus sp*	+
85840	*Tanytarsus sepp*	+
93900	*Elimia sp*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 32
No. Qualitative Taxa: 32 ICI:
Number of Organisms: 0 Qual EPT: 9

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
adj. Twp. Rd. 193

Collection Date: 08/20/2007 River Code: 10-200 RM: 39.00

Taxa Code	Taxa	Quant/Qual
00653	*Eunapius fragilis*	+
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04687	*Placobdella parasitica*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11020	*Acerpenna pygmaea*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
12200	*Isonychia sp*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
13561	*Maccaffertium pulchellum*	+
15501	*Ephemerellidae*	+
17200	*Caenis sp*	+
18100	*Anthopotamus sp*	+
18600	*Ephemera sp*	+
18700	*Hexagenia sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
34130	*Acroneuria frisoni*	+
34715	*Agnetina flavescens*	+
43300	*Ranatra sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
49200	*Climacia sp*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
53800	*Hydroptila sp*	+
57400	*Neophylax sp*	+
58505	*Helicopsyche borealis*	+
59110	*Ceraclea ancylus*	+
59970	*Petrophila sp*	+
60900	*Peltodytes sp*	+
65800	*Berosus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
72340	*Dixella sp*	+
74501	*Ceratopogonidae*	+
74650	*Atrichopogon sp*	+
77115	*Ablabesmyia janta*	+
77120	*Ablabesmyia mallochi*	+
78655	*Procladius (Holotanypus) sp*	+
80350	*Corynoneura sp*	+
81270	*Nanocladius (N.) spiniplenus*	+
82300	*Xylotopus par*	+
82800	*Cladopelma sp*	+
83040	*Dicrotendipes neomodestus*	+
83840	*Microtendipes pedellus group*	+
84155	*Paralauterborniella nigrohalteralis*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84490	*Polypedilum (Cerobregma) ontario*	+
84750	*Stictochironomus sp*	+
85264	*Cladotanytarsus vanderwulpi group Type 4*	+
85800	*Tanytarsus sp*	+
86100	*Chrysops sp*	+
93900	*Elimia sp*	+
94400	*Fossaria sp*	+
97601	*Corbicula fluminea*	+
98600	*Sphaerium sp*	+
99280	*Lasmigona costata*	+
99420	*Amblema plicata plicata*	+
99700	*Potamilus alatus*	+
99860	*Lampsilis radiata luteola*	+
99880	*Lampsilis cardium*	+

No. Quantitative Taxa: 0 Total Taxa: 72
No. Qualitative Taxa: 72 ICI:
Number of Organisms: 0 Qual EPT: 24

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
dst. Shimer Run

Collection Date: 08/20/2007 River Code: 10-200 RM: 30.40

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	21	
01801	*Turbellaria*	1	
03121	*Paludicella articulata*	1	
03360	*Plumatella sp*	2	
03600	*Oligochaeta*	4	+
04680	*Placobdella sp*		+
06201	*Hyalella azteca*		+
11020	*Acerpenna pygmaea*	34	+
11130	*Baetis intercalaris*		+
11200	*Callibaetis sp*		+
11250	*Centroptilum sp (w/o hindwing pads)*		+
11650	*Procloeon sp (w/ hindwing pads)*		+
11651	*Procloeon sp (w/o hindwing pads)*	19	+
11670	*Procloeon viridoculare*		+
12200	*Isonychia sp*		+
13000	*Leucrocuta sp*	9	+
13400	*Stenacron sp*	85	
13521	*Stenonema femoratum*	22	+
13561	*Maccaffertium pulchellum*	113	+
13570	*Maccaffertium terminatum*		+
17200	*Caenis sp*	2	+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*		+
22001	*Coenagrionidae*	1	+
22300	*Argia sp*	1	+
23804	*Basiaeschna janata*		+
23909	*Boyeria vinosa*		+
26600	*Didymops transversa*		+
26715	*Macromia taeniolata*		+
27400	*Neurocordulia sp*		+
28001	*Libellulidae*	2	+
34130	*Acroneuria frisoni*	2	+
34715	*Agnetina flavescens*	2	+
48410	*Corydalus cornutus*	2	+
50315	*Chimarra obscura*		+
52200	*Cheumatopsyche sp*		+
52430	*Ceratopsyche morosa group*		+
52620	*Macrostemum zebratum*		+
53400	*Protoptila sp*		+
53800	*Hydroptila sp*	8	+
57400	*Neophylax sp*		+
57900	*Pycnopsyche sp*		+
58505	*Helicopsyche borealis*		+
59720	*Triaenodes ignitus*		+
59724	*Triaenodes injustus*		+
60300	*Dineutus sp*		+
60900	*Peltodytes sp*	1	+
65800	*Berosus sp*	1	+
66500	*Enochrus sp*	7	+
67800	*Tropisternus sp*		+
68075	*Psephenus herricki*		+
68130	*Helichus sp*		+
68601	*Ancyronyx variegata*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	2	+
69275	*Optioservus trivittatus*		+
69400	*Stenelmis sp*	1	+
72340	*Dixella sp*		+
72700	*Anopheles sp*		+
74501	*Ceratopogonidae*	7	
74650	*Atrichopogon sp*	252	+
77120	*Ablabesmyia mallochi*		+
77130	*Ablabesmyia rhamphe group*		+
77500	*Conchapelopia sp*	12	+
77750	*Hayesomyia senata or Thienemannimyia norena*	31	
78130	*Labrundinia neopilosella*	9	
78140	*Labrundinia pilosella*	6	
80370	*Corynoneura lobata*	160	
80410	*Cricotopus (C.) sp*	12	
80427	*Cricotopus (C.) politus*	31	
81231	*Nanocladius (N.) crassicornus or N. (N.) "rectinervis"*	6	
81250	*Nanocladius (N.) minimus*	6	
81280	*Nanocladius (Plecopteracoluthus) downesi*	3	+
82101	*Thienemanniella taurocapita*	3	
82121	*Thienemanniella lobapodema*	5	
82800	*Cladopelma sp*		+
83040	*Dicrotendipes neomodestus*	50	+
83310	*Glyptotendipes (Heynotendipes) amplus*	3	
83840	*Microtendipes pedellus group*	6	
84450	*Polypedilum (Uresipedilum) flavum*	6	+
84470	*Polypedilum (P.) illinoense*	22	
84520	*Polypedilum (Tripodura) halterale group*		+
84540	*Polypedilum (Tripodura) scalaenum group*	3	+
84700	*Stenochironomus sp*	9	
84800	*Tribelos jucundum*		+
85230	*Cladotanytarsus mancus group*	3	+
85500	*Paratanytarsus sp*	9	

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
dst. Shimer Run

Collection Date: 08/20/2007 River Code: 10-200 RM: 30.40

Taxa Code	Taxa	Quant/Qual	
85625	*Rheotanytarsus sp*	12	+
85720	*Stempellinella fimbriata*	3	
85800	*Tanytarsus sp*	71	
85821	*Tanytarsus glabrescens group sp 7*	43	
87501	*Empididae*		+
93900	*Elimia sp*	27	+
95100	*Physella sp*	5	
97601	*Corbicula fluminea*		+
98600	*Sphaerium sp*		+
99280	*Lasmigona costata*		+
99320	*Tritogonia verrucosa*		+
99680	*Leptodea fragilis*		+
99860	*Lampsilis radiata luteola*		+
99880	*Lampsilis cardium*		+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 53 Total Taxa: 101
No. Qualitative Taxa: 76 ICI: **38**
Number of Organisms: 1158 Qual EPT: 28

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
adj. Lawshe Rd., W of Jacksonville

Collection Date: 08/20/2007 River Code: 10-200 RM: 24.80

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	13	
01801	*Turbellaria*	195	+
03360	*Plumatella sp*	28	
03451	*Urnatella gracilis*	1	
03600	*Oligochaeta*		+
04685	*Placobdella ornata*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydrachnidia*		+
11020	*Acerpenna pygmaea*	30	+
11119	*Plauditus dubius or P. virilis*		+
11130	*Baetis intercalaris*	2	+
11200	*Callibaetis sp*		+
11651	*Procloeon sp (w/o hindwing pads)*	12	
12200	*Isonychia sp*	2	+
13000	*Leucrocuta sp*	19	+
13400	*Stenacron sp*	30	+
13510	*Maccaffertium exiguum*	13	
13521	*Stenonema femoratum*	2	+
13540	*Maccaffertium mediopunctatum*	2	
13561	*Maccaffertium pulchellum*	172	+
17200	*Caenis sp*		+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*		+
18750	*Hexagenia limbata*		+
22001	*Coenagrionidae*		+
22300	*Argia sp*	1	+
26700	*Macromia sp*	1	
34130	*Acroneuria frisoni*	2	+
34715	*Agnetina flavescens*	13	+
43300	*Ranatra sp*		+
45100	*Palmacorixa sp*		+
47600	*Sialis sp*		+
48410	*Corydalus cornutus*		+
50315	*Chimarra obscura*		+
52200	*Cheumatopsyche sp*	13	+
52430	*Ceratopsyche morosa group*	48	+
52540	*Hydropsyche dicantha*	2	+
52620	*Macrostemum zebratum*		+
53800	*Hydroptila sp*	6	+
57400	*Neophylax sp*		+
59110	*Ceraclea ancylus*		+
59510	*Oecetis avara*	6	
59724	*Triaenodes injustus*		+
65800	*Berosus sp*		+
66500	*Enochrus sp*		+
67500	*Laccobius sp*		+
67800	*Tropisternus sp*		+
68075	*Psephenus herricki*		+
68130	*Helichus sp*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*		+
69400	*Stenelmis sp*	10	+
74501	*Ceratopogonidae*	4	
77500	*Conchapelopia sp*	8	
77750	*Hayesomyia senata or Thienemannimyia norena*	207	
78140	*Labrundinia pilosella*	8	
78350	*Meropelopia sp*	32	
78655	*Procladius (Holotanypus) sp*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	28	
80370	*Corynoneura lobata*	20	
80410	*Cricotopus (C.) sp*	32	
80411	*Cricotopus (Isocladius) sp nr. absurdus*	24	
80427	*Cricotopus (C.) politus*	263	
80430	*Cricotopus (C.) tremulus group*	40	
82101	*Thienemanniella taurocapita*	8	
83040	*Dicrotendipes neomodestus*	24	+
84450	*Polypedilum (Uresipedilum) flavum*	24	+
84520	*Polypedilum (Tripodura) halterale group*		+
84540	*Polypedilum (Tripodura) scalaenum group*		+
85625	*Rheotanytarsus sp*	8	
85720	*Stempellinella fimbriata*	8	
85800	*Tanytarsus sp*	24	
85821	*Tanytarsus glabrescens group sp 7*	32	
86200	*Tabanus sp*		+
93900	*Elimia sp*	21	+
97601	*Corbicula fluminea*		+
98001	*Sphaeriidae*	8	
99680	*Leptodea fragilis*		+
99700	*Potamilus alatus*		+
99860	*Lampsilis radiata luteola*		+
99880	*Lampsilis cardium*		+

No. Quantitative Taxa:	44	Total Taxa:	81
No. Qualitative Taxa:	56	ICI:	**44**
Number of Organisms:	1446	Qual EPT:	24

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
Fawcett Rd.

Collection Date: 08/21/2007 River Code: 10-200 RM: 21.35

Taxa Code	Taxa	Quant/Qual
00401	*Spongillidae*	+
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03451	*Urnatella gracilis*	+
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
06904	*Synurella dentata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
11245	*Centroptilum sp*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
25510	*Stylogomphus albistylus*	+
34130	*Acroneuria frisoni*	+
34715	*Agnetina flavescens*	+
43300	*Ranatra sp*	+
44300	*Pelocoris sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
52540	*Hydropsyche dicantha*	+
52620	*Macrostemum zebratum*	+
57400	*Neophylax sp*	+
59001	*Leptoceridae*	+
59110	*Ceraclea ancylus*	+
59970	*Petrophila sp*	+
60300	*Dineutus sp*	+
60900	*Peltodytes sp*	+
65800	*Berosus sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68601	*Ancyronyx variegata*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
72700	*Anopheles sp*	+
74650	*Atrichopogon sp*	+
77120	*Ablabesmyia mallochi*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
81270	*Nanocladius (N.) spiniplenus*	+
82101	*Thienemanniella taurocapita*	+
82300	*Xylotopus par*	+
82885	*Cryptotendipes pseudotener*	+
83158	*Endochironomus nigricans*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
85625	*Rheotanytarsus sp*	+
85800	*Tanytarsus sp*	+
93900	*Elimia sp*	+
94400	*Fossaria sp*	+
97601	*Corbicula fluminea*	+
98600	*Sphaerium sp*	+
99240	*Lasmigona complanata*	+
99420	*Amblema plicata plicata*	+
99700	*Potamilus alatus*	+

No. Quantitative Taxa: 0 Total Taxa: 75
No. Qualitative Taxa: 75 ICI:
Number of Organisms: 0 Qual EPT: 23

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
end of Twp. Rd. 184

Collection Date: 08/21/2007 River Code: 10-200 RM: 15.20

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11014	*Acentrella turbida*	+
11018	*Acerpenna macdunnoughi*	+
11130	*Baetis intercalaris*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
13570	*Maccaffertium terminatum*	+
16700	*Tricorythodes sp*	+
17200	*Caenis sp*	+
18100	*Anthopotamus sp*	+
18600	*Ephemera sp*	+
21001	*Calopterygidae*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
24900	*Gomphus sp*	+
28208	*Erythemis simplicicollis*	+
34130	*Acroneuria frisoni*	+
34600	*Perlinella sp*	+
34715	*Agnetina flavescens*	+
42700	*Belostoma sp*	+
43300	*Ranatra sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
50315	*Chimarra obscura*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
52620	*Macrostemum zebratum*	+
59120	*Ceraclea flava complex*	+
59420	*Nectopsyche pavida*	+
59500	*Oecetis sp*	+
59724	*Triaenodes injustus*	+
59970	*Petrophila sp*	+
60300	*Dineutus sp*	+
65800	*Berosus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
69713	*Lutrochus laticeps*	+
74501	*Ceratopogonidae*	+
83040	*Dicrotendipes neomodestus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
85265	*Cladotanytarsus vanderwulpi group Type 5*	+
85840	*Tanytarsus sepp*	+
86200	*Tabanus sp*	+
93900	*Elimia sp*	+
97601	*Corbicula fluminea*	+
98600	*Sphaerium sp*	+
99400	*Quadrula quadrula*	+
99680	*Leptodea fragilis*	+
99860	*Lampsilis radiata luteola*	+
99880	*Lampsilis cardium*	+

No. Quantitative Taxa: 0 Total Taxa: 64
No. Qualitative Taxa: 64 ICI:
Number of Organisms: 0 Qual EPT: 27

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
St. Rt. 125

Collection Date: 08/21/2007 River Code: 10-200 RM: 10.00

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	367	
01801	*Turbellaria*	4	+
03360	*Plumatella sp*	4	+
03451	*Urnatella gracilis*		+
03600	*Oligochaeta*		+
05900	*Lirceus sp*		+
06904	*Synurella dentata*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydrachnidia*	8	+
11020	*Acerpenna pygmaea*	34	
11130	*Baetis intercalaris*	18	+
11650	*Procloeon sp (w/ hindwing pads)*	3	+
11651	*Procloeon sp (w/o hindwing pads)*		+
11670	*Procloeon viridoculare*		+
12200	*Isonychia sp*	1	+
13000	*Leucrocuta sp*	24	+
13400	*Stenacron sp*		+
13521	*Stenonema femoratum*		+
13561	*Maccaffertium pulchellum*	242	+
13570	*Maccaffertium terminatum*	3	
16700	*Tricorythodes sp*	44	
17200	*Caenis sp*	9	+
18100	*Anthopotamus sp*		+
18600	*Ephemera sp*		+
18750	*Hexagenia limbata*		+
22001	*Coenagrionidae*	4	+
22300	*Argia sp*		+
23909	*Boyeria vinosa*		+
24501	*Gomphidae*		+
26700	*Macromia sp*		+
34130	*Acroneuria frisoni*	3	+
34300	*Neoperla clymene complex*	1	+
34715	*Agnetina flavescens*	6	+
47600	*Sialis sp*		+
48410	*Corydalus cornutus*	19	+
48620	*Nigronia serricornis*	2	
50315	*Chimarra obscura*	7	+
52200	*Cheumatopsyche sp*	106	+
52430	*Ceratopsyche morosa group*	10	+
52540	*Hydropsyche dicantha*	21	+
52570	*Hydropsyche simulans*		+
52620	*Macrostemum zebratum*	5	+
53400	*Protoptila sp*		+
53501	*Hydroptilidae*	1	
59110	*Ceraclea ancylus*		+
59510	*Oecetis avara*	22	+
59970	*Petrophila sp*		+
63300	*Hydroporini*		+
68075	*Psephenus herricki*	1	+
68130	*Helichus sp*		+
68901	*Macronychus glabratus*		+
69400	*Stenelmis sp*	18	+
71100	*Hexatoma sp*		+
72700	*Anopheles sp*		+
74100	*Simulium sp*		+
74501	*Ceratopogonidae*	4	+
77120	*Ablabesmyia mallochi*		+
77500	*Conchapelopia sp*	42	
77750	*Hayesomyia senata or Thienemannimyia norena*	157	+
78655	*Procladius (Holotanypus) sp*		+
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	4	
80370	*Corynoneura lobata*	20	
80410	*Cricotopus (C.) sp*	73	
80427	*Cricotopus (C.) politus*	21	
81280	*Nanocladius (Plecopteracoluthus) downesi*	21	+
82121	*Thienemanniella lobapodema*	8	
83040	*Dicrotendipes neomodestus*	42	
84000	*Parachironomus sp*	21	
84040	*Parachironomus frequens*	10	
84155	*Paralauterborniella nigrohalteralis*		+
84450	*Polypedilum (Uresipedilum) flavum*	387	+
84490	*Polypedilum (Cerobregma) ontario*	10	
84540	*Polypedilum (Tripodura) scalaenum group*	21	+
85625	*Rheotanytarsus sp*	10	
85800	*Tanytarsus sp*		+
85821	*Tanytarsus glabrescens group sp 7*	21	+
93900	*Elimia sp*	21	+
97601	*Corbicula fluminea*	6	+
98600	*Sphaerium sp*		+
99400	*Quadrula quadrula*		+
99680	*Leptodea fragilis*		+
99860	*Lampsilis radiata luteola*		+
99880	*Lampsilis cardium*		+

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
St. Rt. 125

Collection Date: 08/21/2007 River Code: 10-200 RM: 10.00

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

No. Quantitative Taxa:	47	Total Taxa:	83
No. Qualitative Taxa:	66	ICI:	**44**
Number of Organisms:	1886	Qual EPT:	25

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
dst. Beasley Fork

Collection Date: 08/21/2007 River Code: 10-200 RM: 6.00

Taxa Code	Taxa	Quant/Qual	
01200	*Cordylophora lacustris*		+
01320	*Hydra sp*	8	
01801	*Turbellaria*	27	+
03121	*Paludicella articulata*	17	+
03360	*Plumatella sp*	1	+
03600	*Oligochaeta*		+
06201	*Hyalella azteca*		+
08601	*Hydrachnidia*		+
11020	*Acerpenna pygmaea*	2	+
11130	*Baetis intercalaris*		+
12200	*Isonychia sp*	136	+
13000	*Leucrocuta sp*	23	+
13400	*Stenacron sp*	28	
13510	*Maccaffertium exiguum*	4	
13521	*Stenonema femoratum*	24	+
13561	*Maccaffertium pulchellum*	398	+
13570	*Maccaffertium terminatum*		+
16700	*Tricorythodes sp*	8	+
17200	*Caenis sp*		+
18100	*Anthopotamus sp*	2	+
18600	*Ephemera sp*		+
22300	*Argia sp*	1	+
23909	*Boyeria vinosa*		+
24501	*Gomphidae*		+
27001	*Corduliidae*		+
27400	*Neurocordulia sp*		+
34130	*Acroneuria frisoni*	1	
48410	*Corydalus cornutus*	2	
50315	*Chimarra obscura*	19	+
51206	*Cyrnellus fraternus*		+
52200	*Cheumatopsyche sp*	367	+
52430	*Ceratopsyche morosa group*	14	+
52570	*Hydropsyche simulans*		+
52620	*Macrostemum zebratum*		+
53400	*Protoptila sp*		+
53501	*Hydroptilidae*		+
57400	*Neophylax sp*		+
59415	*Nectopsyche exquisita*	2	
59580	*Oecetis persimilis*	2	+
59740	*Triaenodes perna*		+
59970	*Petrophila sp*		+
60300	*Dineutus sp*	1	+
68075	*Psephenus herricki*		+
68130	*Helichus sp*		+
68901	*Macronychus glabratus*	22	+
69400	*Stenelmis sp*		+
71100	*Hexatoma sp*		+
77130	*Ablabesmyia rhamphe group*	5	
77500	*Conchapelopia sp*	3	
77750	*Hayesomyia senata or Thienemannimyia norena*	37	+
77800	*Helopelopia sp*		+
78140	*Labrundinia pilosella*	5	+
78450	*Nilotanypus fimbriatus*	21	
80360	*Corynoneura "celeripes" (sensu Simpson & Bode, 1980)*	4	
80370	*Corynoneura lobata*	26	
81231	*Nanocladius (N.) crassicornus or N. (N.) "rectinervis"*		+
81240	*Nanocladius (N.) distinctus*	3	
83040	*Dicrotendipes neomodestus*		+
84020	*Parachironomus carinatus*	3	+
84450	*Polypedilum (Uresipedilum) flavum*	83	+
84490	*Polypedilum (Cerobregma) ontario*	5	
84540	*Polypedilum (Tripodura) scalaenum group*	13	+
84651	*Stelechomyia perpulchra*		+
85625	*Rheotanytarsus sp*	24	+
85800	*Tanytarsus sp*	5	+
85821	*Tanytarsus glabrescens group sp 7*		+
93900	*Elimia sp*	187	+
97601	*Corbicula fluminea*		+
98600	*Sphaerium sp*		+
99280	*Lasmigona costata*		+
99420	*Amblema plicata plicata*		+
99680	*Leptodea fragilis*		+
99700	*Potamilus alatus*		+
99880	*Lampsilis cardium*		+

No. Quantitative Taxa:	38	Total Taxa:	74
No. Qualitative Taxa:	61	ICI:	**48**
Number of Organisms:	1533	Qual EPT:	22

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Ohio Brush Creek
upst. St. Rt. 32

Collection Date: 08/21/2007 River Code: 10-200 RM: 0.50

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	28	
03337	*Hyalinella punctata*	2	
03600	*Oligochaeta*	40	+
05494	*Taphromysis louisianae*		+
06700	*Crangonyx sp*	1	
06810	*Gammarus fasciatus*		+
08451	*Palaemonetes kadiakensis*		+
08601	*Hydrachnidia*		+
17200	*Caenis sp*	9	
22300	*Argia sp*	5	+
45400	*Trichocorixa sp*		+
49101	*Sisyridae*	1	
51206	*Cyrnellus fraternus*	125	
52200	*Cheumatopsyche sp*	1	
53800	*Hydroptila sp*	2	+
59100	*Ceraclea sp*	1	
60300	*Dineutus sp*	1	+
60900	*Peltodytes sp*		+
63900	*Laccophilus sp*		+
65800	*Berosus sp*		+
68130	*Helichus sp*		+
77120	*Ablabesmyia mallochi*		+
77130	*Ablabesmyia rhamphe group*	246	
78655	*Procladius (Holotanypus) sp*		+
82800	*Cladopelma sp*		+
83002	*Dicrotendipes modestus*	1476	+
83040	*Dicrotendipes neomodestus*	656	+
83050	*Dicrotendipes lucifer*	492	
83051	*Dicrotendipes simpsoni*	191	
84470	*Polypedilum (P.) illinoense*		+
84520	*Polypedilum (Tripodura) halterale group*		+
84960	*Pseudochironomus sp*	27	
85230	*Cladotanytarsus mancus group*		+
85800	*Tanytarsus sp*		+
93200	*Hydrobiidae*	2	
95100	*Physella sp*		+
96900	*Ferrissia sp*	75	
97601	*Corbicula fluminea*		+
97710	*Dreissena polymorpha*	69	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 21 Total Taxa: 39
No. Qualitative Taxa: 25 ICI: **12**
Number of Organisms: 3450 Qual EPT: 1

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Beasley Fork
adj. St. Rt. 247, dst. trib.

Collection Date: 08/08/2007 River Code: 10-205 RM: 4.70

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
05800	*Caecidotea sp*	+
06904	*Synurella dentata*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
27500	*Somatochlora sp*	+
51400	*Nyctiophylax sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
52530	*Hydropsyche depravata group*	+
59970	*Petrophila sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71900	*Tipula sp*	+
77800	*Helopelopia sp*	+
82730	*Chironomus (C.) decorus group*	+
83040	*Dicrotendipes neomodestus*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+
83840	*Microtendipes pedellus group*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84750	*Stictochironomus sp*	+
85625	*Rheotanytarsus sp*	+
94400	*Fossaria sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 30
No. Qualitative Taxa: 30 ICI:
Number of Organisms: 0 Qual EPT: 9

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Beasley Fork

Collection Date: 08/08/2007 River Code: 10-205 RM: 3.20

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
06904	*Synurella dentata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
34120	*Acroneuria carolinensis*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
63300	*Hydroporini*	+
65800	*Berosus sp*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
77800	*Helopelopia sp*	+
80351	*Corynoneura n.sp 1*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
95100	*Physella sp*	+
97601	*Corbicula fluminea*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 31
No. Qualitative Taxa: 31 ICI:
Number of Organisms: 0 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Beasley Fork
ford near mouth

Collection Date: 08/22/2007 River Code: 10-205 RM: 0.75

Taxa Code	Taxa	Quant/Qual
03360	*Plumatella sp*	+
03600	*Oligochaeta*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11130	*Baetis intercalaris*	+
11245	*Centroptilum sp*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
18700	*Hexagenia sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
34410	*Paragnetina media*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
66500	*Enochrus sp*	+
68075	*Psephenus herricki*	+
68201	*Scirtidae*	+
69400	*Stenelmis sp*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
82820	*Cryptochironomus sp*	+
83840	*Microtendipes pedellus group*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84475	*Polypedilum (P.) ophioides*	+
84750	*Stictochironomus sp*	+
84800	*Tribelos jucundum*	+
85230	*Cladotanytarsus mancus group*	+
85625	*Rheotanytarsus sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 37
No. Qualitative Taxa: 37 ICI:
Number of Organisms: 0 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Moore Run
upst. St. Rt. 247

Collection Date: 08/08/2007 River Code: 10-206 RM: 0.40

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
06904	*Synurella dentata*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
11018	*Acerpenna macdunnoughi*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22300	*Argia sp*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
52200	*Cheumatopsyche sp*	+
63300	*Hydroporini*	+
65800	*Berosus sp*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
71900	*Tipula sp*	+
77800	*Helopelopia sp*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
87540	*Hemerodromia sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 27
No. Qualitative Taxa: 27 ICI:
Number of Organisms: 0 Qual EPT: 10

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Cedar Run
Gustin Rd.

Collection Date: 08/08/2007 River Code: 10-209 RM: 0.38

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
08601	*Hydrachnidia*	+
11130	*Baetis intercalaris*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13000	*Leucrocuta sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
13590	*Maccaffertium vicarium*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
21200	*Calopteryx sp*	+
22300	*Argia sp*	+
23804	*Basiaeschna janata*	+
23909	*Boyeria vinosa*	+
25510	*Stylogomphus albistylus*	+
26700	*Macromia sp*	+
33100	*Leuctra sp*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
48620	*Nigronia serricornis*	+
50301	*Chimarra aterrima*	+
50315	*Chimarra obscura*	+
51400	*Nyctiophylax sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59720	*Triaenodes ignitus*	+
59730	*Triaenodes melaca*	+
59970	*Petrophila sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69400	*Stenelmis sp*	+
72340	*Dixella sp*	+
77130	*Ablabesmyia rhamphe group*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	+
93900	*Elimia sp*	+

No. Quantitative Taxa: 0
No. Qualitative Taxa: 47
Number of Organisms: 0

Total Taxa: 47
ICI:
Qual EPT: 24

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Lick Fork
upst. unnamed trib.

Collection Date: 08/02/2007 River Code: 10-211 RM: 4.30

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
05800	*Caecidotea sp*	+
05900	*Lirceus sp*	+
06904	*Synurella dentata*	+
08200	*Orconectes sp*	+
08601	*Hydrachnidia*	+
11120	*Baetis flavistriga*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
63900	*Laccophilus sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
71900	*Tipula sp*	+
77750	*Hayesomyia senata or Thienemannimyia norena*	+
82730	*Chironomus (C.) decorus group*	+
82820	*Cryptochironomus sp*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84750	*Stictochironomus sp*	+
86100	*Chrysops sp*	+
95100	*Physella sp*	+
97601	*Corbicula fluminea*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 32
No. Qualitative Taxa: 32 ICI:
Number of Organisms: 0 Qual EPT: 8

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Lick Fork
Vaughn Ridge Rd.

Collection Date: 08/02/2007 River Code: 10-211 RM: 1.03

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03600	*Oligochaeta*	+
05800	*Caecidotea sp*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
08601	*Hydrachnidia*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
25510	*Stylogomphus albistylus*	+
34130	*Acroneuria frisoni*	+
48410	*Corydalus cornutus*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52540	*Hydropsyche dicantha*	+
57400	*Neophylax sp*	+
58505	*Helicopsyche borealis*	+
63300	*Hydroporini*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
69400	*Stenelmis sp*	+
71000	*Helius sp*	+
71100	*Hexatoma sp*	+
77115	*Ablabesmyia janta*	+
77120	*Ablabesmyia mallochi*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83840	*Microtendipes pedellus group*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84460	*Polypedilum (P.) fallax group*	+
85840	*Tanytarsus sepp*	+
86100	*Chrysops sp*	+
97601	*Corbicula fluminea*	+
99880	*Lampsilis cardium*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0
No. Qualitative Taxa: 41
Number of Organisms: 0

Total Taxa: 41
ICI:
Qual EPT: 13

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Treber Run
St. Rt. 41

Collection Date: 08/01/2007 River Code: 10-212 RM: 0.10

Taxa Code	Taxa	Quant/Qual
05800	*Caecidotea sp*	+
06904	*Synurella dentata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
25510	*Stylogomphus albistylus*	+
33100	*Leuctra sp*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
60900	*Peltodytes sp*	+
66200	*Cymbiodyta sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71700	*Pilaria sp*	+
71900	*Tipula sp*	+
77120	*Ablabesmyia mallochi*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
85201	*Cladotanytarsus species group A*	+
86100	*Chrysops sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 33
No. Qualitative Taxa: 33 ICI:
Number of Organisms: 0 Qual EPT: 8

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Cave Run
at mouth, adj. lane

Collection Date: 08/01/2007 River Code: 10-213 RM: 0.10

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
05800	*Caecidotea sp*	+
06830	*Gammarus minus*	+
06904	*Synurella dentata*	+
08200	*Orconectes sp*	+
11119	*Plauditus dubius or P. virilis*	+
11430	*Diphetor hageni*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
33100	*Leuctra sp*	+
34130	*Acroneuria frisoni*	+
44501	*Corixidae*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
50300	*Chimarra sp*	+
51600	*Polycentropus sp*	+
57900	*Pycnopsyche sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
83840	*Microtendipes pedellus group*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 28
No. Qualitative Taxa: 28 ICI:
Number of Organisms: 0 Qual EPT: 12

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Trib. to Lick Fork (RM 4.02)
at farm lane

Collection Date: 08/02/2007 River Code: 10-215 RM: 2.80

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
04935	*Erpobdella punctata punctata*	+
05900	*Lirceus sp*	+
08601	*Hydrachnidia*	+
11200	*Callibaetis sp*	+
28001	*Libellulidae*	+
43570	*Neoplea sp*	+
45300	*Sigara sp*	+
60900	*Peltodytes sp*	+
63900	*Laccophilus sp*	+
65800	*Berosus sp*	+
66500	*Enochrus sp*	+
67800	*Tropisternus sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
85501	*Paratanytarsus longistilus*	+
89001	*Sciomyzidae*	+
95100	*Physella sp*	+
96264	*Planorbella (Pierosoma) pilsbryi*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 20
No. Qualitative Taxa: 20 ICI:
Number of Organisms: 0 Qual EPT: 1

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Trib. to Lick Fork (RM 4.02)
St. Rt. 41

Collection Date: 08/02/2007 River Code: 10-215 RM: 0.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
06904	*Synurella dentata*	+			
08200	*Orconectes sp*	+			
11200	*Callibaetis sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
22001	*Coenagrionidae*	+			
22300	*Argia sp*	+			
45300	*Sigara sp*	+			
45400	*Trichocorixa sp*	+			
52200	*Cheumatopsyche sp*	+			
57900	*Pycnopsyche sp*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
66500	*Enochrus sp*	+			
67500	*Laccobius sp*	+			
67700	*Paracymus sp*	+			
68075	*Psephenus herricki*	+			
68130	*Helichus sp*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
71900	*Tipula sp*	+			
71910	*Tipula abdominalis*	+			
72700	*Anopheles sp*	+			
77500	*Conchapelopia sp*	+			
79400	*Zavrelimyia sp*	+			
82730	*Chironomus (C.) decorus group*	+			
83002	*Dicrotendipes modestus*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
95100	*Physella sp*	+			
96002	*Helisoma anceps anceps*	+			

No. Quantitative Taxa: 0 Total Taxa: 32
No. Qualitative Taxa: 32 ICI:
Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Little East Fork
old St. Rt. 32

Collection Date: 07/25/2007 River Code: 10-216 RM: 0.90

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
05900	*Lirceus sp*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
12200	*Isonychia sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
18600	*Ephemera sp*	+			
24900	*Gomphus sp*	+			
47600	*Sialis sp*	+			
48410	*Corydalus cornutus*	+			
51600	*Polycentropus sp*	+			
52200	*Cheumatopsyche sp*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
65800	*Berosus sp*	+			
66500	*Enochrus sp*	+			
67800	*Tropisternus sp*	+			
68075	*Psephenus herricki*	+			
69225	*Optioservus fastiditus*	+			
69400	*Stenelmis sp*	+			
74501	*Ceratopogonidae*	+			
78402	*Natarsia baltimoreus*	+			
78655	*Procladius (Holotanypus) sp*	+			
82730	*Chironomus (C.) decorus group*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84750	*Stictochironomus sp*	+			
86200	*Tabanus sp*	+			
95100	*Physella sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 27
No. Qualitative Taxa: 27 ICI:
Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Little East Fork
near mouth

Collection Date: 07/25/2007 River Code: 10-216 RM: 0.40

Taxa Code	Taxa	Quant/Qual
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
18700	*Hexagenia sp*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
63300	*Hydroporini*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
82730	*Chironomus (C.) decorus group*	+
84750	*Stictochironomus sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 17
No. Qualitative Taxa: 17 ICI:
Number of Organisms: 0 Qual EPT: 7

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Crooked Creek
upst. S.R. 73

Collection Date: 08/09/2007 River Code: 10-218 RM: 2.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
04685	*Placobdella ornata*	+			
05900	*Lirceus sp*	+			
06904	*Synurella dentata*	+			
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
18600	*Ephemera sp*	+			
22001	*Coenagrionidae*	+			
22300	*Argia sp*	+			
23909	*Boyeria vinosa*	+			
27500	*Somatochlora sp*	+			
34300	*Neoperla clymene complex*	+			
45300	*Sigara sp*	+			
47600	*Sialis sp*	+			
57900	*Pycnopsyche sp*	+			
63300	*Hydroporini*	+			
66200	*Cymbiodyta sp*	+			
68075	*Psephenus herricki*	+			
68201	*Scirtidae*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
72700	*Anopheles sp*	+			
77120	*Ablabesmyia mallochi*	+			
78655	*Procladius (Holotanypus) sp*	+			
82730	*Chironomus (C.) decorus group*	+			
82885	*Cryptotendipes pseudotener*	+			
83840	*Microtendipes pedellus group*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84460	*Polypedilum (P.) fallax group*	+			
84750	*Stictochironomus sp*	+			
93900	*Elimia sp*	+			
95100	*Physella sp*	+			
96264	*Planorbella (Pierosoma) pilsbryi*	+			
98600	*Sphaerium sp*	+			
99100	*Pyganodon grandis*	+			

No. Quantitative Taxa: 0 Total Taxa: 37
No. Qualitative Taxa: 37 ICI:
Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
Heaton Rd.

Collection Date: 07/24/2007 River Code: 10-220 RM: 20.53

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+			
05800	*Caecidotea sp*	+			
05900	*Lirceus sp*	+			
06904	*Synurella dentata*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
22001	*Coenagrionidae*	+			
43205	*Nepa apiculata*	+			
47600	*Sialis sp*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
68708	*Dubiraphia vittata group*	+			
78401	*Natarsia species A (sensu Roback, 1978)*	+			
82730	*Chironomus (C.) decorus group*	+			
83051	*Dicrotendipes simpsoni*	+			
83590	*Kiefferulus sp*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84750	*Stictochironomus sp*	+			
95100	*Physella sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 22
No. Qualitative Taxa: 22 ICI:
Number of Organisms: 0 Qual EPT: 3

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
Melblanc Rd.

Collection Date: 07/24/2007 River Code: 10-220 RM: 17.92

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03040	*Fredericella sp*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
06904	*Synurella dentata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11245	*Centroptilum sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
23804	*Basiaeschna janata*	+
27500	*Somatochlora sp*	+
43205	*Nepa apiculata*	+
43300	*Ranatra sp*	+
45100	*Palmacorixa sp*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
59001	*Leptoceridae*	+
60400	*Gyrinus sp*	+
63300	*Hydroporini*	+
66200	*Cymbiodyta sp*	+
67800	*Tropisternus sp*	+
68025	*Ectopria sp*	+
68075	*Psephenus herricki*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
71800	*Pseudolimnophila sp*	+
72340	*Dixella sp*	+
74501	*Ceratopogonidae*	+
77800	*Helopelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
82820	*Cryptochironomus sp*	+
83158	*Endochironomus nigricans*	+
83300	*Glyptotendipes (G.) sp*	+
83840	*Microtendipes pedellus group*	+
83900	*Nilothauma sp*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
84800	*Tribelos jucundum*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
98600	*Sphaerium sp*	+
99860	*Lampsilis radiata luteola*	+

No. Quantitative Taxa: 0 Total Taxa: 49
No. Qualitative Taxa: 49 ICI:
Number of Organisms: 0 Qual EPT: 7

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
dst. Turkey Run

Collection Date: 07/31/2007 River Code: 10-220 RM: 15.20

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
05900	*Lirceus sp*	+
08601	*Hydrachnidia*	+
11020	*Acerpenna pygmaea*	+
11120	*Baetis flavistriga*	+
11251	*Centroptilum sp (w/ hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
23909	*Boyeria vinosa*	+
27600	*Epitheca (Tetragoneuria) sp*	+
47600	*Sialis sp*	+
50315	*Chimarra obscura*	+
51400	*Nyctiophylax sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59700	*Triaenodes sp*	+
60900	*Peltodytes sp*	+
64800	*Uvarus sp*	+
65800	*Berosus sp*	+
66200	*Cymbiodyta sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
72340	*Dixella sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
77115	*Ablabesmyia janta*	+
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	+
82600	*Axarus sp*	+
82820	*Cryptochironomus sp*	+
83040	*Dicrotendipes neomodestus*	+
84201	*Paratendipes sp 1*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
86200	*Tabanus sp*	+
93900	*Elimia sp*	+
94400	*Fossaria sp*	+
95100	*Physella sp*	+

No. Quantitative Taxa: 0 Total Taxa: 51
No. Qualitative Taxa: 51 ICI:
Number of Organisms: 0 Qual EPT: 13

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
Buck Run Rd.

Collection Date: 07/31/2007 River Code: 10-220 RM: 12.74

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11018	*Acerpenna macdunnoughi*	+
11119	*Plauditus dubius or P. virilis*	+
11130	*Baetis intercalaris*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
27600	*Epitheca (Tetragoneuria) sp*	+
43205	*Nepa apiculata*	+
47600	*Sialis sp*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59740	*Triaenodes perna*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
67800	*Tropisternus sp*	+
68025	*Ectopria sp*	+
68075	*Psephenus herricki*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
82820	*Cryptochironomus sp*	+
83040	*Dicrotendipes neomodestus*	+
83300	*Glyptotendipes (G.) sp*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
87540	*Hemerodromia sp*	+
93900	*Elimia sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 48
No. Qualitative Taxa: 48 ICI:
Number of Organisms: 0 Qual EPT: 15

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
upst. Little West Fork

Collection Date: 07/31/2007 River Code: 10-220 RM: 10.50

Taxa Code	Taxa	Quant/Qual
00401	*Spongillidae*	+
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
05900	*Lirceus sp*	+
06904	*Synurella dentata*	+
08200	*Orconectes sp*	+
11118	*Plauditus dubius*	+
11130	*Baetis intercalaris*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
47600	*Sialis sp*	+
50315	*Chimarra obscura*	+
51400	*Nyctiophylax sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
58505	*Helicopsyche borealis*	+
59110	*Ceraclea ancylus*	+
60900	*Peltodytes sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
78500	*Paramerina fragilis*	+
83300	*Glyptotendipes (G.) sp*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84300	*Phaenopsectra obediens group*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
87540	*Hemerodromia sp*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
98600	*Sphaerium sp*	+
99100	*Pyganodon grandis*	+
99860	*Lampsilis radiata luteola*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 40
No. Qualitative Taxa: 40 ICI:
Number of Organisms: 0 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
St. Rt. 32

Collection Date: 08/01/2007 River Code: 10-220 RM: 6.10

Taxa Code	Taxa	Quant/Qual
00700	*Radiospongilla crateriformis*	+
00805	*Spongilla lacustris*	+
01320	*Hydra sp*	+
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03451	*Urnatella gracilis*	+
03600	*Oligochaeta*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11130	*Baetis intercalaris*	+
11200	*Callibaetis sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
28208	*Erythemis simplicicollis*	+
42700	*Belostoma sp*	+
47600	*Sialis sp*	+
49200	*Climacia sp*	+
50315	*Chimarra obscura*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
58505	*Helicopsyche borealis*	+
59100	*Ceraclea sp*	+
59970	*Petrophila sp*	+
60900	*Peltodytes sp*	+
65800	*Berosus sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
71000	*Helius sp*	+
74501	*Ceratopogonidae*	+
77115	*Ablabesmyia janta*	+
77500	*Conchapelopia sp*	+
77800	*Helopelopia sp*	+
78130	*Labrundinia neopilosella*	+
78655	*Procladius (Holotanypus) sp*	+
81231	*Nanocladius (N.) crassicornus or N. (N.) "rectinervis"*	+
82730	*Chironomus (C.) decorus group*	+
83040	*Dicrotendipes neomodestus*	+
83150	*Endochironomus sp*	+
83300	*Glyptotendipes (G.) sp*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84520	*Polypedilum (Tripodura) halterale group*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84888	*Xenochironomus xenolabis*	+
85625	*Rheotanytarsus sp*	+
85821	*Tanytarsus glabrescens group sp 7*	+
93900	*Elimia sp*	+
96120	*Menetus (Micromenetus) dilatatus*	+
97601	*Corbicula fluminea*	+

No. Quantitative Taxa: 0 Total Taxa: 54
No. Qualitative Taxa: 54 ICI:
Number of Organisms: 0 Qual EPT: 12

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: West Fork Ohio Brush Creek
dst. ford, dst. Georges Creek

Collection Date: 07/25/2007 River Code: 10-220 RM: 1.10

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11200	*Callibaetis sp*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13561	*Maccaffertium pulchellum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
42700	*Belostoma sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
48620	*Nigronia serricornis*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
65800	*Berosus sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
74501	*Ceratopogonidae*	+
77500	*Conchapelopia sp*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83040	*Dicrotendipes neomodestus*	+
83300	*Glyptotendipes (G.) sp*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
86200	*Tabanus sp*	+
93900	*Elimia sp*	+
99400	*Quadrula quadrula*	+
99700	*Potamilus alatus*	+
99860	*Lampsilis radiata luteola*	+
99880	*Lampsilis cardium*	+

No. Quantitative Taxa: 0 Total Taxa: 49
No. Qualitative Taxa: 49 ICI:
Number of Organisms: 0 Qual EPT: 13

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Georges Creek

Collection Date: 07/25/2007 River Code: 10-222 RM: 3.80

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
06700	*Crangonyx sp*	+
06904	*Synurella dentata*	+
08601	*Hydrachnidia*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
24900	*Gomphus sp*	+
45100	*Palmacorixa sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
57900	*Pycnopsyche sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
66200	*Cymbiodyta sp*	+
67500	*Laccobius sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71800	*Pseudolimnophila sp*	+
72420	*Chaoborus sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83040	*Dicrotendipes neomodestus*	+
83840	*Microtendipes pedellus group*	+
84750	*Stictochironomus sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 35
No. Qualitative Taxa: 35 ICI:
Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Georges Creek
Nicholas Rd.

Collection Date: 07/25/2007 River Code: 10-222 RM: 0.10

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
42700	*Belostoma sp*	+
44501	*Corixidae*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57900	*Pycnopsyche sp*	+
63300	*Hydroporini*	+
67500	*Laccobius sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
71800	*Pseudolimnophila sp*	+
71900	*Tipula sp*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83040	*Dicrotendipes neomodestus*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
85821	*Tanytarsus glabrescens group sp 7*	+
87400	*Stratiomys sp*	+
95100	*Physella sp*	+
96264	*Planorbella (Pierosoma) pilsbryi*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 32
No. Qualitative Taxa: 32 ICI:
Number of Organisms: 0 Qual EPT: 8

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Cherry Fork
St. Rt. 136

Collection Date: 08/01/2007 River Code: 10-224 RM: 8.74

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
06904	*Synurella dentata*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	+
17200	*Caenis sp*	+
47600	*Sialis sp*	+
60900	*Peltodytes sp*	+
65800	*Berosus sp*	+
68201	*Scirtidae*	+
72700	*Anopheles sp*	+
72900	*Culex sp*	+
74501	*Ceratopogonidae*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83003	*Dicrotendipes fumidus*	+
83040	*Dicrotendipes neomodestus*	+
83051	*Dicrotendipes simpsoni*	+
83300	*Glyptotendipes (G.) sp*	+
84010	*Parachironomus "abortivus" (sensu Simpson & Bode, 1980)*	+
84520	*Polypedilum (Tripodura) halterale group*	+
84750	*Stictochironomus sp*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 27
No. Qualitative Taxa: 27 ICI:
Number of Organisms: 0 Qual EPT: 4

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Cherry Fork
Paint Rd.

Collection Date: 08/01/2007 River Code: 10-224 RM: 7.50

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
08250	*Orconectes (Procericambarus) rusticus*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
45100	*Palmacorixa sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
68075	*Psephenus herricki*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
77120	*Ablabesmyia mallochi*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83002	*Dicrotendipes modestus*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
85840	*Tanytarsus sepp*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 25
No. Qualitative Taxa: 25 ICI:
Number of Organisms: 0 Qual EPT: 4

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Cherry Fork
Graces Run Rd.

Collection Date: 08/01/2007 River Code: 10-224 RM: 2.61

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
06201	*Hyalella azteca*	+
08200	*Orconectes sp*	+
08601	*Hydrachnidia*	+
11130	*Baetis intercalaris*	+
11245	*Centroptilum sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23804	*Basiaeschna janata*	+
45400	*Trichocorixa sp*	+
50315	*Chimarra obscura*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
66500	*Enochrus sp*	+
67500	*Laccobius sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	+
82820	*Cryptochironomus sp*	+
83040	*Dicrotendipes neomodestus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
97601	*Corbicula fluminea*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0
No. Qualitative Taxa: 41
Number of Organisms: 0

Total Taxa: 41
ICI:
Qual EPT: 10

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Grace Run
St. Rt. 247

Collection Date: 07/31/2007 River Code: 10-225 RM: 1.40

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03360	*Plumatella sp*	+
03600	*Oligochaeta*	+
05900	*Lirceus sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11120	*Baetis flavistriga*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
28955	*Plathemis lydia*	+
47600	*Sialis sp*	+
51400	*Nyctiophylax sp*	+
51600	*Polycentropus sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
65800	*Berosus sp*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
79020	*Tanypus neopunctipennis*	+
82730	*Chironomus (C.) decorus group*	+
83300	*Glyptotendipes (G.) sp*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
96002	*Helisoma anceps anceps*	+
96120	*Menetus (Micromenetus) dilatatus*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 30
No. Qualitative Taxa: 30 ICI:
Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Buck Run
Armstrong Rd.

Collection Date: 07/25/2007 River Code: 10-228 RM: 0.38

Taxa Code	Taxa	Quant/Qual
03040	*Fredericella sp*	+
03600	*Oligochaeta*	+
05800	*Caecidotea sp*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
06700	*Crangonyx sp*	+
06904	*Synurella dentata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11245	*Centroptilum sp*	+
11645	*Procloeon sp*	+
11670	*Procloeon viridoculare*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
27500	*Somatochlora sp*	+
44501	*Corixidae*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
51600	*Polycentropus sp*	+
57900	*Pycnopsyche sp*	+
60400	*Gyrinus sp*	+
60900	*Peltodytes sp*	+
64800	*Uvarus sp*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71700	*Pilaria sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
86200	*Tabanus sp*	+
87400	*Stratiomys sp*	+
95100	*Physella sp*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0
No. Qualitative Taxa: 44
Number of Organisms: 0

Total Taxa: 44
ICI:
Qual EPT: 9

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Little West Fork
Forsythe Rd.

Collection Date: 07/24/2007 River Code: 10-229 RM: 6.26

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04686	*Placobdella papillifera*	+
05800	*Caecidotea sp*	+
06201	*Hyalella azteca*	+
06904	*Synurella dentata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11200	*Callibaetis sp*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
24900	*Gomphus sp*	+
30000	*Plecoptera*	+
43205	*Nepa apiculata*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
50301	*Chimarra aterrima*	+
52200	*Cheumatopsyche sp*	+
58505	*Helicopsyche borealis*	+
59730	*Triaenodes melaca*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
63900	*Laccophilus sp*	+
65800	*Berosus sp*	+
67500	*Laccobius sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
77355	*Clinotanypus pinguis*	+
77500	*Conchapelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
82730	*Chironomus (C.) decorus group*	+
83158	*Endochironomus nigricans*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84470	*Polypedilum (P.) illinoense*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
85821	*Tanytarsus glabrescens group sp 7*	+
86200	*Tabanus sp*	+
95100	*Physella sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 50
No. Qualitative Taxa: 50 ICI:
Number of Organisms: 0 Qual EPT: 10

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Little West Fork
Shaw-Baker Rd.

Collection Date: 07/24/2007 River Code: 10-229 RM: 5.70

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04687	*Placobdella parasitica*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
24900	*Gomphus sp*	+
27500	*Somatochlora sp*	+
43300	*Ranatra sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
51600	*Polycentropus sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59730	*Triaenodes melaca*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
65700	*Anacaena sp*	+
67500	*Laccobius sp*	+
67700	*Paracymus sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
71900	*Tipula sp*	+
74501	*Ceratopogonidae*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78402	*Natarsia baltimoreus*	+
82820	*Cryptochironomus sp*	+
84750	*Stictochironomus sp*	+
95100	*Physella sp*	+
96900	*Ferrissia sp*	+
98600	*Sphaerium sp*	+
99860	*Lampsilis radiata luteola*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0
No. Qualitative Taxa: 43
Number of Organisms: 0

Total Taxa: 43
ICI:
Qual EPT: 8

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Little West Fork
Buck Run Rd.

Collection Date: 07/31/2007 River Code: 10-229 RM: 0.10

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
08250	*Orconectes (Procericambarus) rusticus*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
22001	*Coenagrionidae*	+
28500	*Libellula sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
60900	*Peltodytes sp*	+
65800	*Berosus sp*	+
66200	*Cymbiodyta sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
71900	*Tipula sp*	+
74501	*Ceratopogonidae*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
87540	*Hemerodromia sp*	+
96120	*Menetus (Micromenetus) dilatatus*	+
98600	*Sphaerium sp*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 30
No. Qualitative Taxa: 30 ICI:
Number of Organisms: 0 Qual EPT: 7

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Elk Fork
ford off Tri-County Rd.

Collection Date: 07/24/2007 River Code: 10-230 RM: 1.61

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+			
03600	*Oligochaeta*	+			
04964	*Mooreobdella microstoma*	+			
05800	*Caecidotea sp*	+			
06904	*Synurella dentata*	+			
08250	*Orconectes (Procericambarus) rusticus*	+			
11651	*Procloeon sp (w/o hindwing pads)*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
22300	*Argia sp*	+			
27500	*Somatochlora sp*	+			
45400	*Trichocorixa sp*	+			
47600	*Sialis sp*	+			
52200	*Cheumatopsyche sp*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
67800	*Tropisternus sp*	+			
68075	*Psephenus herricki*	+			
68708	*Dubiraphia vittata group*	+			
69400	*Stenelmis sp*	+			
71700	*Pilaria sp*	+			
74100	*Simulium sp*	+			
74501	*Ceratopogonidae*	+			
77500	*Conchapelopia sp*	+			
78350	*Meropelopia sp*	+			
78401	*Natarsia species A (sensu Roback, 1978)*	+			
78655	*Procladius (Holotanypus) sp*	+			
82730	*Chironomus (C.) decorus group*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84450	*Polypedilum (Uresipedilum) flavum*	+			
84750	*Stictochironomus sp*	+			
95100	*Physella sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 34
No. Qualitative Taxa: 34 ICI:
Number of Organisms: 0 Qual EPT: 5

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Elm Run
adj. lane off N. Union Rd.

Collection Date: 07/19/2007 River Code: 10-233 RM: 0.60

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
04685	*Placobdella ornata*	+			
05900	*Lirceus sp*	+			
06201	*Hyalella azteca*	+			
06904	*Synurella dentata*	+			
08200	*Orconectes sp*	+			
11651	*Procloeon sp (w/o hindwing pads)*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
18600	*Ephemera sp*	+			
23909	*Boyeria vinosa*	+			
26600	*Didymops transversa*	+			
45100	*Palmacorixa sp*	+			
47600	*Sialis sp*	+			
51600	*Polycentropus sp*	+			
57900	*Pycnopsyche sp*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
67800	*Tropisternus sp*	+			
68075	*Psephenus herricki*	+			
68708	*Dubiraphia vittata group*	+			
72700	*Anopheles sp*	+			
74501	*Ceratopogonidae*	+			
78401	*Natarsia species A (sensu Roback, 1978)*	+			
78655	*Procladius (Holotanypus) sp*	+			
82730	*Chironomus (C.) decorus group*	+			
83040	*Dicrotendipes neomodestus*	+			
83300	*Glyptotendipes (G.) sp*	+			
83840	*Microtendipes pedellus group*	+			
84750	*Stictochironomus sp*	+			
84800	*Tribelos jucundum*	+			
85230	*Cladotanytarsus mancus group*	+			
85500	*Paratanytarsus sp*	+			
85800	*Tanytarsus sp*	+			
86100	*Chrysops sp*	+			
94400	*Fossaria sp*	+			
95100	*Physella sp*	+			
98600	*Sphaerium sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 39
No. Qualitative Taxa: 39 ICI:
Number of Organisms: 0 Qual EPT: 7

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Elk Run
upst. Elm Run

Collection Date: 07/26/2007 River Code: 10-234 RM: 1.50

Taxa Code	Taxa	Quant/Qual
03360	*Plumatella sp*	+
04685	*Placobdella ornata*	+
05900	*Lirceus sp*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11645	*Procloeon sp*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13590	*Maccaffertium vicarium*	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
24900	*Gomphus sp*	+
27500	*Somatochlora sp*	+
28500	*Libellula sp*	+
34300	*Neoperla clymene complex*	+
47600	*Sialis sp*	+
50301	*Chimarra aterrima*	+
50315	*Chimarra obscura*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
52530	*Hydropsyche depravata group*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68707	*Dubiraphia quadrinotata*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69200	*Optioservus sp*	+
71900	*Tipula sp*	+
71910	*Tipula abdominalis*	+
72340	*Dixella sp*	+
74501	*Ceratopogonidae*	+
77115	*Ablabesmyia janta*	+
77120	*Ablabesmyia mallochi*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
80351	*Corynoneura n.sp 1*	+
80363	*Corynoneura sp 12*	+
81650	*Parametriocnemus sp*	+
83050	*Dicrotendipes lucifer*	+
83300	*Glyptotendipes (G.) sp*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84460	*Polypedilum (P.) fallax group*	+
84750	*Stictochironomus sp*	+
85702	*Stempellina sp 2*	+
85800	*Tanytarsus sp*	+
87400	*Stratiomys sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 61
No. Qualitative Taxa: 61 ICI:
Number of Organisms: 0 Qual EPT: 18

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Elk Run
Coss Rd.

Collection Date: 07/26/2007 River Code: 10-234 RM: 0.90

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
08200	*Orconectes sp*	+
08601	*Hydrachnidia*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
11670	*Procloeon viridoculare*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
34130	*Acroneuria frisoni*	+
45100	*Palmacorixa sp*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59100	*Ceraclea sp*	+
59740	*Triaenodes perna*	+
60300	*Dineutus sp*	+
60900	*Peltodytes sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68707	*Dubiraphia quadrinotata*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69200	*Optioservus sp*	+
69400	*Stenelmis sp*	+
72340	*Dixella sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
78140	*Labrundinia pilosella*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83040	*Dicrotendipes neomodestus*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
93900	*Elimia sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 48
No. Qualitative Taxa: 48 ICI:
Number of Organisms: 0 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Lost Fork
St. Rt. 247

Collection Date: 07/19/2007 River Code: 10-237 RM: 2.50

Taxa Code	Taxa	Quant/Qual
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydrachnidia*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
58505	*Helicopsyche borealis*	+
60400	*Gyrinus sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
67500	*Laccobius sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
72340	*Dixella sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
84750	*Stictochironomus sp*	+
84800	*Tribelos jucundum*	+
85230	*Cladotanytarsus mancus group*	+
94400	*Fossaria sp*	+
95100	*Physella sp*	+
96002	*Helisoma anceps anceps*	+

Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa: 0 Total Taxa: 33
No. Qualitative Taxa: 33 ICI:
Number of Organisms: 0 Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Lost Fork
Peach Orchard Rd.

Collection Date: 07/19/2007 River Code: 10-237 RM: 1.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+			
05800	*Caecidotea sp*	+			
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+			
11651	*Procloeon sp (w/o hindwing pads)*	+			
12200	*Isonychia sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
13590	*Maccaffertium vicarium*	+			
17200	*Caenis sp*	+			
18600	*Ephemera sp*	+			
22001	*Coenagrionidae*	+			
34130	*Acroneuria frisoni*	+			
34300	*Neoperla clymene complex*	+			
47600	*Sialis sp*	+			
50315	*Chimarra obscura*	+			
51600	*Polycentropus sp*	+			
52200	*Cheumatopsyche sp*	+			
52530	*Hydropsyche depravata group*	+			
58505	*Helicopsyche borealis*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
66200	*Cymbiodyta sp*	+			
67800	*Tropisternus sp*	+			
68075	*Psephenus herricki*	+			
68130	*Helichus sp*	+			
68201	*Scirtidae*	+			
69400	*Stenelmis sp*	+			
71900	*Tipula sp*	+			
74501	*Ceratopogonidae*	+			
77800	*Helopelopia sp*	+			
78655	*Procladius (Holotanypus) sp*	+			
82730	*Chironomus (C.) decorus group*	+			
83840	*Microtendipes pedellus group*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84315	*Phaenopsectra flavipes*	+			
84520	*Polypedilum (Tripodura) halterale group*	+			
85800	*Tanytarsus sp*	+			
86200	*Tabanus sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 38
No. Qualitative Taxa: 38 ICI:
Number of Organisms: 0 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Baker Fork
Dry Bone Rd.

Collection Date: 07/11/2007 River Code: 10-240 RM: 14.80

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
06904	*Synurella dentata*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
13400	*Stenacron sp*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23905	*Boyeria grafiana*	+
23909	*Boyeria vinosa*	+
23950	*Epiaeschna heros*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
52200	*Cheumatopsyche sp*	+
52530	*Hydropsyche depravata group*	+
59720	*Triaenodes ignitus*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69400	*Stenelmis sp*	+
72700	*Anopheles sp*	+
74100	*Simulium sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
80350	*Corynoneura sp*	+
83900	*Nilothauma sp*	+
84315	*Phaenopsectra flavipes*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84700	*Stenochironomus sp*	+
85625	*Rheotanytarsus sp*	+
85800	*Tanytarsus sp*	+
85821	*Tanytarsus glabrescens group sp 7*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
97601	*Corbicula fluminea*	+

No. Quantitative Taxa: 0
No. Qualitative Taxa: 45
Number of Organisms: 0

Total Taxa: 45
ICI:
Qual EPT: 8

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Baker Fork
Fort Hill Rd.

Collection Date: 08/07/2007 River Code: 10-240 RM: 10.50 A

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
05800	*Caecidotea sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
08601	*Hydrachnidia*	+
11130	*Baetis intercalaris*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
13590	*Maccaffertium vicarium*	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	+
17200	*Caenis sp*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
24900	*Gomphus sp*	+
27500	*Somatochlora sp*	+
44501	*Corixidae*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
48620	*Nigronia serricornis*	+
50804	*Lype diversa*	+
51400	*Nyctiophylax sp*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59720	*Triaenodes ignitus*	+
68075	*Psephenus herricki*	+
68601	*Ancyronyx variegata*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69225	*Optioservus fastiditus*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
72340	*Dixella sp*	+
74501	*Ceratopogonidae*	+
77800	*Helopelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
81280	*Nanocladius (Plecopteracoluthus) downesi*	+
81650	*Parametriocnemus sp*	+
82820	*Cryptochironomus sp*	+
82885	*Cryptotendipes pseudotener*	+
83051	*Dicrotendipes simpsoni*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+
83840	*Microtendipes pedellus group*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84470	*Polypedilum (P.) illinoense*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
84800	*Tribelos jucundum*	+
85500	*Paratanytarsus sp*	+
85625	*Rheotanytarsus sp*	+
85800	*Tanytarsus sp*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
96900	*Ferrissia sp*	+

No. Quantitative Taxa: 0 Total Taxa: 60
No. Qualitative Taxa: 60 ICI:
Number of Organisms: 0 Qual EPT: 17

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Baker Fork
Fort Hill Rd.

Collection Date: 09/17/2007 River Code: 10-240 RM: 10.50 B

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	1	
03360	*Plumatella sp*		+
03600	*Oligochaeta*	4	+
08200	*Orconectes sp*	1	
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydrachnidia*		+
11130	*Baetis intercalaris*		+
11250	*Centroptilum sp (w/o hindwing pads)*		+
11651	*Procloeon sp (w/o hindwing pads)*	2	
12200	*Isonychia sp*		+
13400	*Stenacron sp*	346	+
13521	*Stenonema femoratum*	39	+
13590	*Maccaffertium vicarium*	19	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	18	+
17200	*Caenis sp*	214	+
21300	*Hetaerina sp*	2	
22001	*Coenagrionidae*		+
22300	*Argia sp*	1	+
25510	*Stylogomphus albistylus*		+
27500	*Somatochlora sp*		+
48410	*Corydalus cornutus*	1	+
48620	*Nigronia serricornis*	1	+
50804	*Lype diversa*	5	+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	1	+
57400	*Neophylax sp*		+
57900	*Pycnopsyche sp*		+
58505	*Helicopsyche borealis*		+
68075	*Psephenus herricki*	1	+
68130	*Helichus sp*		+
68601	*Ancyronyx variegata*		+
68708	*Dubiraphia vittata group*		+
68901	*Macronychus glabratus*	8	+
69400	*Stenelmis sp*		+
71100	*Hexatoma sp*		+
71910	*Tipula abdominalis*		+
72340	*Dixella sp*		+
72700	*Anopheles sp*		+
74501	*Ceratopogonidae*	2	
77115	*Ablabesmyia janta*	13	
77120	*Ablabesmyia mallochi*	39	+
77500	*Conchapelopia sp*	43	+
78140	*Labrundinia pilosella*	43	+
78655	*Procladius (Holotanypus) sp*		+
80370	*Corynoneura lobata*	100	
81231	*Nanocladius (N.) crassicornus or N. (N.) "rectinervis"*	4	
81270	*Nanocladius (N.) spiniplenus*	13	
82121	*Thienemanniella lobapodema*	8	+
83040	*Dicrotendipes neomodestus*	4	
83840	*Microtendipes pedellus group*	39	+
84000	*Parachironomus sp*	4	
84210	*Paratendipes albimanus or P. duplicatus*	22	
84460	*Polypedilum (P.) fallax group*	9	
84470	*Polypedilum (P.) illinoense*		+
84540	*Polypedilum (Tripodura) scalaenum group*		+
84800	*Tribelos jucundum*	4	
85500	*Paratanytarsus sp*	17	
85625	*Rheotanytarsus sp*	13	+
85720	*Stempellinella fimbriata*	30	+
85800	*Tanytarsus sp*	56	+
85802	*Tanytarsus curticornis*	4	
85821	*Tanytarsus glabrescens group sp 7*	108	+
86100	*Chrysops sp*		+
93900	*Elimia sp*	32	+
95100	*Physella sp*	10	
96900	*Ferrissia sp*	14	+
97601	*Corbicula fluminea*		+

No. Quantitative Taxa: 41 Total Taxa: 67
No. Qualitative Taxa: 50 ICI: **48**
Number of Organisms: 1295 Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Baker Fork
Horner Chapel Rd.

Collection Date: 08/20/2007 River Code: 10-240 RM: 1.49

Taxa Code	Taxa	Quant/Qual
01320	*Hydra sp*	+
03600	*Oligochaeta*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11130	*Baetis intercalaris*	+
11670	*Procloeon viridoculare*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
13590	*Maccaffertium vicarium*	+
16200	*Eurylophella sp*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
22001	*Coenagrionidae*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
24900	*Gomphus sp*	+
25510	*Stylogomphus albistylus*	+
27307	*Epitheca (Epicordulia) princeps*	+
34130	*Acroneuria frisoni*	+
43300	*Ranatra sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
48410	*Corydalus cornutus*	+
48620	*Nigronia serricornis*	+
50315	*Chimarra obscura*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59720	*Triaenodes ignitus*	+
59970	*Petrophila sp*	+
60300	*Dineutus sp*	+
60900	*Peltodytes sp*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68601	*Ancyronyx variegata*	+
68708	*Dubiraphia vittata group*	+
69200	*Optioservus sp*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
72340	*Dixella sp*	+
72700	*Anopheles sp*	+
77355	*Clinotanypus pinguis*	+
77800	*Helopelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
83040	*Dicrotendipes neomodestus*	+
83840	*Microtendipes pedellus group*	+
84470	*Polypedilum (P.) illinoense*	+
84790	*Tribelos fuscicorne*	+
85802	*Tanytarsus curticornis*	+
85821	*Tanytarsus glabrescens group sp 7*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
97601	*Corbicula fluminea*	+
98600	*Sphaerium sp*	+
99860	*Lampsilis radiata luteola*	+
99880	*Lampsilis cardium*	+

No. Quantitative Taxa: 0 Total Taxa: 59
No. Qualitative Taxa: 59 ICI:
Number of Organisms: 0 Qual EPT: 17

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Middle Fork Baker Fork
lane dst. Sinking Spring Rd.

Collection Date: 07/10/2007 River Code: 10-241 RM: 5.40

Taxa Code	Taxa	Quant/Qual
00805	*Spongilla lacustris*	+
03360	*Plumatella sp*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
05900	*Lirceus sp*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
08601	*Hydrachnidia*	+
11130	*Baetis intercalaris*	+
11430	*Diphetor hageni*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
13590	*Maccaffertium vicarium*	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	+
17200	*Caenis sp*	+
22300	*Argia sp*	+
23909	*Boyeria vinosa*	+
24900	*Gomphus sp*	+
33100	*Leuctra sp*	+
34130	*Acroneuria frisoni*	+
34300	*Neoperla clymene complex*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
48620	*Nigronia serricornis*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	+
52430	*Ceratopsyche morosa group*	+
52530	*Hydropsyche depravata group*	+
57400	*Neophylax sp*	+
58505	*Helicopsyche borealis*	+
63300	*Hydroporini*	+
67500	*Laccobius sp*	+
68075	*Psephenus herricki*	+
68707	*Dubiraphia quadrinotata*	+
68708	*Dubiraphia vittata group*	+
69210	*Optioservus ampliatus*	+
69400	*Stenelmis sp*	+
71900	*Tipula sp*	+
74501	*Ceratopogonidae*	+
77130	*Ablabesmyia rhamphe group*	+
77800	*Helopelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
82780	*Chironomus (C.) staegeri group*	+
82820	*Cryptochironomus sp*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84750	*Stictochironomus sp*	+
85500	*Paratanytarsus sp*	+
85625	*Rheotanytarsus sp*	+
87540	*Hemerodromia sp*	+
93900	*Elimia sp*	+
95100	*Physella sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0 Total Taxa: 57
No. Qualitative Taxa: 57 ICI:
Number of Organisms: 0 Qual EPT: 18

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Middle Fork Baker Fork
Strait Creek Rd.

Collection Date: 08/07/2007 River Code: 10-241 RM: 0.30

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
05800	*Caecidotea sp*	+
08250	*Orconectes (Procericambarus) rusticus*	+
11651	*Procloeon sp (w/o hindwing pads)*	+
13400	*Stenacron sp*	+
13521	*Stenonema femoratum*	+
13540	*Maccaffertium mediopunctatum*	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	+
16200	*Eurylophella sp*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
18700	*Hexagenia sp*	+
21200	*Calopteryx sp*	+
22001	*Coenagrionidae*	+
23909	*Boyeria vinosa*	+
24900	*Gomphus sp*	+
25510	*Stylogomphus albistylus*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
51600	*Polycentropus sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	+
59740	*Triaenodes perna*	+
60300	*Dineutus sp*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
67500	*Laccobius sp*	+
67800	*Tropisternus sp*	+
68130	*Helichus sp*	+
68201	*Scirtidae*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69400	*Stenelmis sp*	+
71100	*Hexatoma sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
77800	*Helopelopia sp*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84750	*Stictochironomus sp*	+
93900	*Elimia sp*	+
98200	*Pisidium sp*	+
98600	*Sphaerium sp*	+

No. Quantitative Taxa: 0
No. Qualitative Taxa: 47
Number of Organisms: 0

Total Taxa: 47
ICI:
Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Strait Creek
dst. Strait Creek Rd.

Collection Date: 07/11/2007 River Code: 10-245 RM: 0.60

Taxa Code	Taxa	Quant/Qual
03600	*Oligochaeta*	+
05800	*Caecidotea sp*	+
06904	*Synurella dentata*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
11120	*Baetis flavistriga*	+
11250	*Centroptilum sp (w/o hindwing pads)*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
12200	*Isonychia sp*	+
13521	*Stenonema femoratum*	+
13590	*Maccaffertium vicarium*	+
17200	*Caenis sp*	+
18600	*Ephemera sp*	+
23909	*Boyeria vinosa*	+
25510	*Stylogomphus albistylus*	+
26100	*Cordulegaster sp*	+
33100	*Leuctra sp*	+
34130	*Acroneuria frisoni*	+
47600	*Sialis sp*	+
48610	*Nigronia fasciatus*	+
48620	*Nigronia serricornis*	+
50301	*Chimarra aterrima*	+
52200	*Cheumatopsyche sp*	+
57400	*Neophylax sp*	+
59580	*Oecetis persimilis*	+
63300	*Hydroporini*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
69275	*Optioservus trivittatus*	+
69400	*Stenelmis sp*	+
77115	*Ablabesmyia janta*	+
77500	*Conchapelopia sp*	+
77800	*Helopelopia sp*	+
78450	*Nilotanypus fimbriatus*	+
80350	*Corynoneura sp*	+
81650	*Parametriocnemus sp*	+
82200	*Tvetenia bavarica group*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84300	*Phaenopsectra obediens group*	+
84415	*Polypedilum (P.) sp*	+
84440	*Polypedilum (Uresipedilum) aviceps*	+
84450	*Polypedilum (Uresipedilum) flavum*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84700	*Stenochironomus sp*	+
85802	*Tanytarsus curticornis*	+
93900	*Elimia sp*	+

No. Quantitative Taxa: 0
No. Qualitative Taxa: 47
Number of Organisms: 0

Total Taxa: 47
ICI:
Qual EPT: 14

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Muddy Fork
Frost Rd.

Collection Date: 08/09/2007 River Code: 10-246 RM: 0.39

Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+
03600	*Oligochaeta*	+
04685	*Placobdella ornata*	+
04964	*Mooreobdella microstoma*	+
05900	*Lirceus sp*	+
06904	*Synurella dentata*	+
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+
11120	*Baetis flavistriga*	+
11130	*Baetis intercalaris*	+
13400	*Stenacron sp*	+
14950	*Leptophlebia sp or Paraleptophlebia sp*	+
17200	*Caenis sp*	+
21200	*Calopteryx sp*	+
22300	*Argia sp*	+
23804	*Basiaeschna janata*	+
23909	*Boyeria vinosa*	+
24900	*Gomphus sp*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
52200	*Cheumatopsyche sp*	+
59720	*Triaenodes ignitus*	+
60900	*Peltodytes sp*	+
63300	*Hydroporini*	+
67700	*Paracymus sp*	+
68130	*Helichus sp*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69400	*Stenelmis sp*	+
71900	*Tipula sp*	+
71910	*Tipula abdominalis*	+
72700	*Anopheles sp*	+
74501	*Ceratopogonidae*	+
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	+
77800	*Helopelopia sp*	+
78401	*Natarsia species A (sensu Roback, 1978)*	+
78655	*Procladius (Holotanypus) sp*	+
82730	*Chironomus (C.) decorus group*	+
82820	*Cryptochironomus sp*	+
82885	*Cryptotendipes pseudotener*	+
84210	*Paratendipes albimanus or P. duplicatus*	+
84470	*Polypedilum (P.) illinoense*	+
84750	*Stictochironomus sp*	+
85800	*Tanytarsus sp*	+
93900	*Elimia sp*	+

No. Quantitative Taxa: 0
No. Qualitative Taxa: 45
Number of Organisms: 0

Total Taxa: 45
ICI:
Qual EPT: 7

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Shimer Run
at mouth

Collection Date: 08/22/2007 River Code: 10-248 RM: 0.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	*Turbellaria*	+			
03600	*Oligochaeta*	+			
05800	*Caecidotea sp*	+			
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+			
11120	*Baetis flavistriga*	+			
11130	*Baetis intercalaris*	+			
12200	*Isonychia sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
13561	*Maccaffertium pulchellum*	+			
18600	*Ephemera sp*	+			
21200	*Calopteryx sp*	+			
50315	*Chimarra obscura*	+			
51600	*Polycentropus sp*	+			
52200	*Cheumatopsyche sp*	+			
52530	*Hydropsyche depravata group*	+			
57400	*Neophylax sp*	+			
59720	*Triaenodes ignitus*	+			
66500	*Enochrus sp*	+			
68075	*Psephenus herricki*	+			
68708	*Dubiraphia vittata group*	+			
68901	*Macronychus glabratus*	+			
69225	*Optioservus fastiditus*	+			
69400	*Stenelmis sp*	+			
74100	*Simulium sp*	+			
77500	*Conchapelopia sp*	+			
77800	*Helopelopia sp*	+			
78401	*Natarsia species A (sensu Roback, 1978)*	+			
78655	*Procladius (Holotanypus) sp*	+			
82820	*Cryptochironomus sp*	+			
83840	*Microtendipes pedellus group*	+			
84210	*Paratendipes albimanus or P. duplicatus*	+			
84440	*Polypedilum (Uresipedilum) aviceps*	+			
84750	*Stictochironomus sp*	+			
93900	*Elimia sp*	+			
95100	*Physella sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 36
No. Qualitative Taxa: 36 ICI:
Number of Organisms: 0 Qual EPT: 13

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Trib. to Beasley Fork (RM 4.60)
St. Rt. 247

Collection Date: 08/08/2007 River Code: 10-252 RM: 0.17

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	*Plumatella sp*	+			
03600	*Oligochaeta*	+			
05800	*Caecidotea sp*	+			
05900	*Lirceus sp*	+			
06904	*Synurella dentata*	+			
08260	*Orconectes (Crokerinus) sanbornii sanbornii*	+			
11120	*Baetis flavistriga*	+			
11130	*Baetis intercalaris*	+			
11651	*Procloeon sp (w/o hindwing pads)*	+			
12200	*Isonychia sp*	+			
13400	*Stenacron sp*	+			
13521	*Stenonema femoratum*	+			
17200	*Caenis sp*	+			
22300	*Argia sp*	+			
34130	*Acroneuria frisoni*	+			
50315	*Chimarra obscura*	+			
51400	*Nyctiophylax sp*	+			
51600	*Polycentropus sp*	+			
52200	*Cheumatopsyche sp*	+			
60900	*Peltodytes sp*	+			
63300	*Hydroporini*	+			
67500	*Laccobius sp*	+			
67800	*Tropisternus sp*	+			
68075	*Psephenus herricki*	+			
69400	*Stenelmis sp*	+			
71900	*Tipula sp*	+			
77800	*Helopelopia sp*	+			
82820	*Cryptochironomus sp*	+			
83840	*Microtendipes pedellus group*	+			
84450	*Polypedilum (Uresipedilum) flavum*	+			
84750	*Stictochironomus sp*	+			
85840	*Tanytarsus sepp*	+			
87400	*Stratiomys sp*	+			
95100	*Physella sp*	+			

No. Quantitative Taxa: 0 Total Taxa: 34
No. Qualitative Taxa: 34 ICI:
Number of Organisms: 0 Qual EPT: 12