

---

# B

|

## **STATUS OF WATER QUALITY SCIOTO RIVER (UPPER) WATERSHED**

### **Table of Contents**

B1	Aquatic Life Use Attainment .....	6
B2	Recreation Use Attainment.....	13
B3	Public Drinking Water Supply Use Attainment .....	16
B4	Human Health Use Attainment .....	16



## ***Scioto River (upper) Watershed TMDLs***

---

There are over 1,070 miles of rivers and streams in the upper Scioto River watershed. Of these, 444 miles (41 percent) have been assigned specific aquatic life and recreation use designations. The small headwater streams that have not been explicitly designated with aquatic life uses carry water chemistry criteria associated with warm water habitats (WWH). These criteria can be found in Ohio's water quality standards ([OAC 3745-1-7](#)).

The latest evaluation of beneficial uses was carried out through the 2009 and 2011 upper Scioto River TMDL survey; however these recommendations are not yet in rule. The last rule making for beneficial use designations became effective in October of 2009, and the distribution of aquatic life use designations based on this is approximately 92 percent WWH, five percent modified warm water habitat (MWH), and about four percent limited resource waters (LRW). Recommendations for future rule makings include assigning modified warmwater habitat (MWH) to three small tributaries (Dunlap Creek, Wallace Fork, and Eliot Run) that are low-gradient streams that have ongoing channel maintenance for drainage purposes.

Of the miles of streams designated for recreation uses in the basin, 79 percent are primary contact recreation class B, 14 percent are primary contact recreation class A (i.e., the Scioto River starting near Kenton and continuing through the project area and about 14 miles of the Little Scioto River from upstream of Marion to its mouth), and seven percent are secondary contact use.

The technical support document for the upper Scioto River study, which has the justification for the use designations as well as most of the data collected throughout the water quality survey, can be found at: [http://www.epa.state.oh.us/dsw/document\\_index/psdindx.aspx](http://www.epa.state.oh.us/dsw/document_index/psdindx.aspx).

### **Characteristics of the water quality sampling coverage for the upper Scioto River watershed**

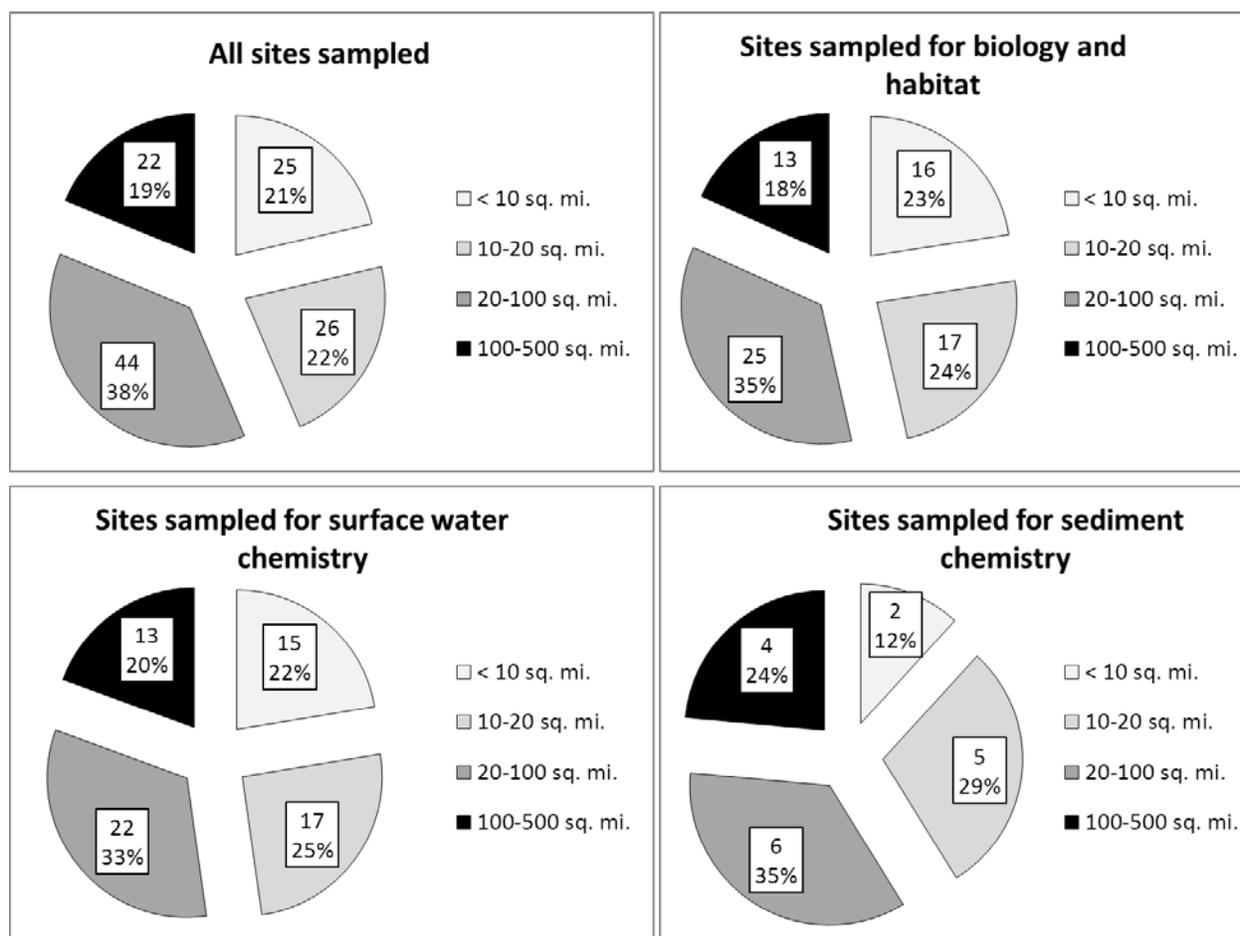
The upper Scioto River and its associated tributary streams were surveyed in 2009 and 2011 using biological, bacteriological, and chemical measures as indicators of water quality. A total of 117 unique sites were surveyed for one or more measures of quality of the stream system. Of these, 62 sites were evaluated for the quality of the aquatic life communities and ecological habitat (for aquatic life use goals), 29 for the concentrations of bacteria that may pose threats to human health and safety (for recreation use goals), 67 for various chemical constituents in the water column of streams, reservoirs, five for wastewater effluent, 18 for fish tissue, and 17 for chemical constituents in the streambed sediment. Surface water chemistry and biological measures of water quality were taken at an average rate of about one site per 15 miles of streams throughout the entire watershed; however, many of the stream miles used in generating this average correspond to very small streams. When considering only the larger named tributaries and the Scioto River, there is a significantly greater density of coverage, namely there are survey sites on average every 6.5 miles.

For biological survey sites, drainage area determines the methods employed to survey the stream, the way in which the biological indices are calculated, and the criteria thresholds that are to be applied to the results. The reasons for this are that stream size impacts efficiencies of sampling equipment and sampling methods as well as the nature of the aquatic communities themselves. Also, though not related to sampling efficiency or baseline aquatic community structure, the responsiveness of the stream system to more localized perturbations and stresses is higher in smaller streams. Plans to study a watershed therefore are created based on consideration of these issues as well as consideration of the size of the survey area and how best to equitably represent the universe of streams in terms of their size and the potential sources of water quality stress. Smaller streams receive, based on their much higher frequency

**Scioto River (upper) Watershed TMDLs**

of occurrence in a watershed (i.e., there are far more small streams than large streams), a greater proportion of the allotted stream sample locations. Such an approach is beneficial to water quality management since it better facilitates identification of problem areas and potential pollution sources on more discrete levels. By contrast, larger streams tend to aggregate the sources of stress and reflect the cumulative effects of watershed character and/or human activities. Both large and small streams have value in indicating the quality of water resources in a watershed.

The overall average drainage area size for water chemistry sites (n = 67) in the study is 66.8 square miles, while the median value is 22.3 square miles. For the aquatic life use survey sites the values are 66.4 and 23.1 square miles for the average and median values, respectively. Figure B-1 is pie charts for the distribution of drainage areas across the sites per the type of sampling being done. Distributions are very similar for the four drainage area categories that were selected, and approximately half of the sites have drainage areas of 20 square miles or less. However, survey sites with drainage areas between 20 and 100 square miles represent about one third of the samples for each of the types of samples.



**Figure B-1. Distribution of drainage areas among water chemistry, aquatic life, and bacteria survey sites throughout the upper Scioto River watershed. Note that the drainage area classes for aquatic life sites differ slightly from the other two types of sites in the figure.**

### Scioto River (upper) Watershed TMDLs

The timing of sample collection for water chemistry samples has a substantial impact on the results as well as how those results should be interpreted. Namely, high flow events versus low flow events and the respective response to precipitation and run off, as well as time of year are very likely to produce very different response in the stream system reflected by different chemical concentration values. Figure B-2 shows the hydrograph (mean daily flow values) of the Scioto River at a location near Prospect, Ohio (USGS gage number 3219500) which is a general indicator of flow conditions in tributaries throughout the watershed.

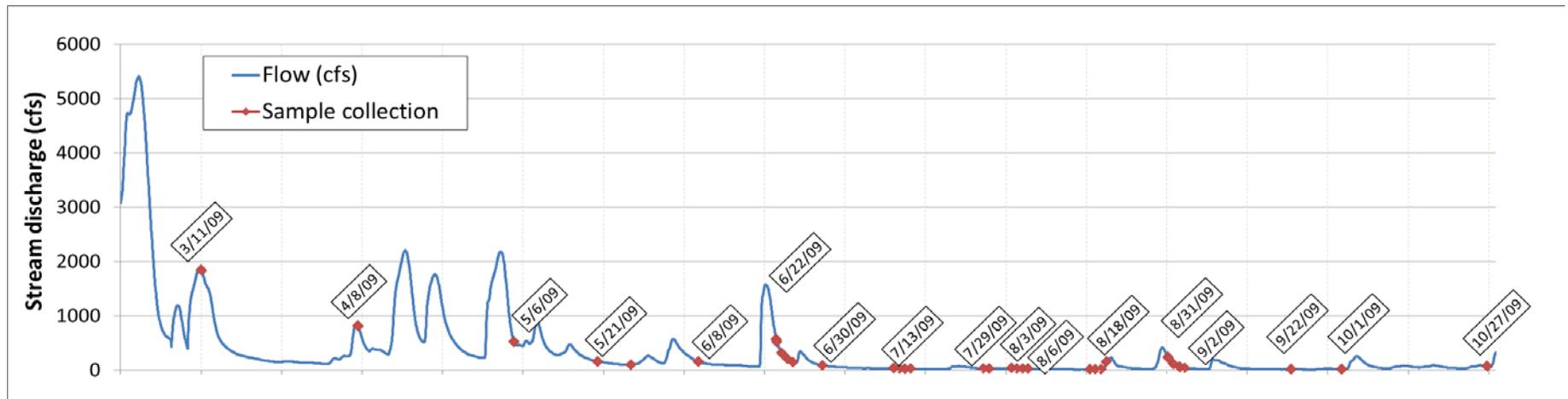


Figure B-2. Water chemistry (nutrients) sampling dates at 80 sites in the upper Scioto River watershed relative stream flow conditions on the upper Scioto River (USGS gage number 3146500) from July through December of 2008.

## B1 Aquatic Life Use Attainment

Ohio EPA performed a comprehensive water quality study in the upper Scioto River watershed in 2009. Sixty-two sites were studied for biological health, 67 sites for water chemistry, 29 sites for recreation use, and 18 sites for human health (fish contaminants) use. Sites were scattered throughout the watershed.

Overall, less than half of the sites (42 percent) evaluated for aquatic life uses fully met the bio-criteria. About one-fourth failed to meet even one of the three bio-criteria and therefore is in non-attainment, while 32 percent is in partial attainment. The Little Scioto River watershed showed the worst performance from the aquatic communities as none of the eleven sites surveyed there fully attained their bio-criteria; nine of which were in non attainment (which is over half of the non attaining sites in the entire upper Scioto River watershed). McDonald Creek (0202) and Fulton Creek (0504) likewise stood out in terms of poor aquatic life performances and high level of non attaining sites. The remaining 12-digit HUCs generally had a high percentage of fully and/or partially attaining sites (Figure B-3). Figure B-4 is a map of the entire project area showing locations where aquatic life uses were evaluated and the results of the evaluation in terms of achieving the water quality standards. Table B-1 is a listing of all of these sites and the associated biometric and habitat scores. Table B-2 shows the summary statistics for the respective scores for all of the sites in the project area.

The degraded aquatic communities in Little Scioto River are primarily impacted by stressors emanating from crop and animal agriculture and associated land drainage practices. Excessive fine sediment and poor habitat quality are the top causes of aquatic life use impairment; however, nutrients and organic enrichment and associated impacts on dissolved oxygen concentrations are also significant problems. Low dissolved oxygen is not noted with elevated nutrients but instead in association with organic enrichment, where loading occurs through combined sewer systems. Legacy creosote pollution is still having an impact on the Little Scioto River near its mouth and is likely entering the water column from loading from combined sewers as well as re-suspension of contaminated sediment from the streambed. Manure laden run off is also a source of nutrients and, on occasions, has led to fish kills. Table B-3 is a list of only sites that show aquatic life use impairment, and the associated causes and sources of impairment for each of these sites is indicated.

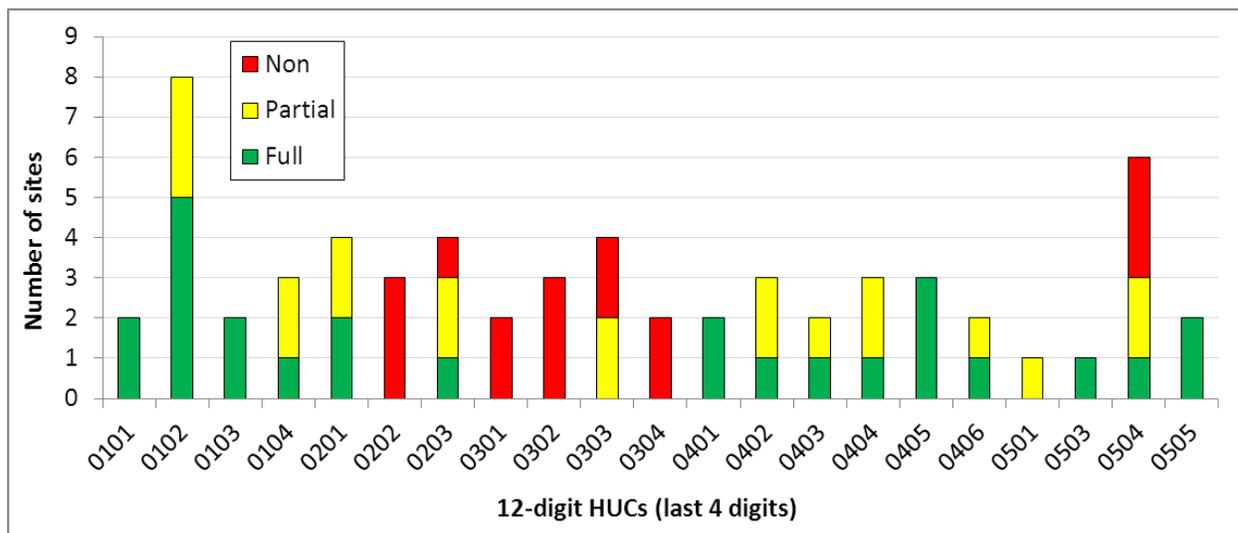
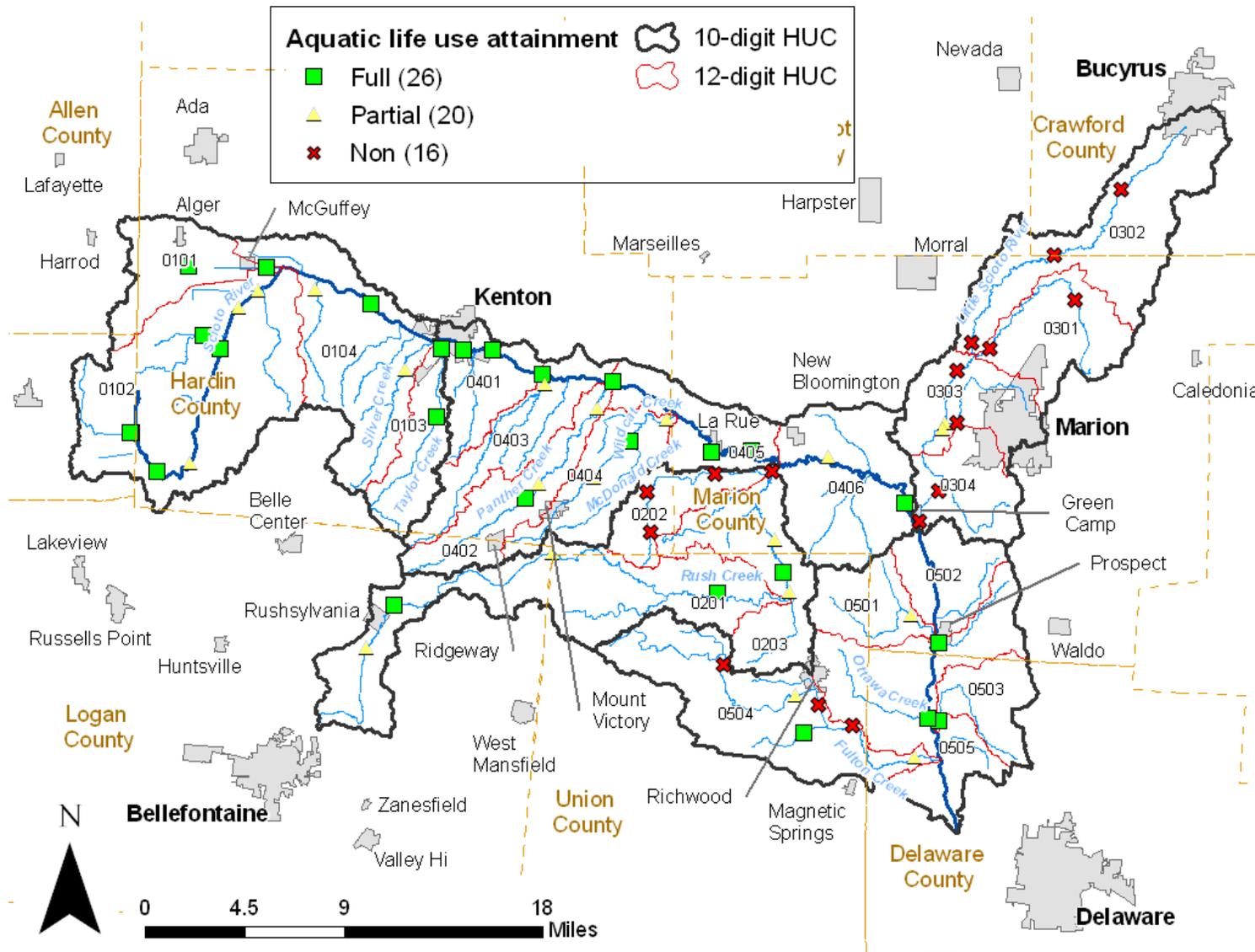


Figure B-3. Distribution of site results per 12-digit HUC for aquatic life use attainment.

**Scioto River (upper) Watershed TMDLs**



**Figure B-4. Spatial distribution of the aquatic life use attainment status of the biological survey sites.**

**Scioto River (upper) Watershed TMDLs**

**Table B-1. Aquatic life use attainment status and biological and habitat index scores.**

HUC12 (last 4)	Stream	River Mile	Drainage area (sq. mile)	ALU attainment	IBI score	MiWB score	ICI score	ICI narrative	QHEI score	ALU designation	STORET
0101	Cottonwood Ditch	4.1	11.3	Full	26			Fair	24	MWH-C	V01S20
0101	Cottonwood Ditch	0.68	19.3	Full	34		32		18	MWH-C	V01S08
0102	Dunlap Creek	1.01	8.3	Full	36			Fair	20.5	WWH	300689
0102	Scioto River	236.7	4.9	Full	54				61.5	WWH	301236
0102	Scioto River	234.39	18.3	Full	44			Good	77.5	WWH	V01W18
0102	Scioto River	231.86	28	Partial	39	7.49	46		79.5	WWH	V01W19
0102	Scioto River	226.3	49	Full	44	8.50	40		38.5	WWH	201834
0102	Scioto River	224.2	62	Partial	37	7.60	44		32.5	WWH	V01P06
0102	Scioto River	223.05	67	Partial	43	7.57	54		37.5	WWH	V01W20
0102	Wallace Fork	0.2	4.8	Full	32			Fair	39	WWH	300688
0103	Taylor Creek	4.43	12.7	Full	42		26	Good	80	WWH	V01S07
0103	Taylor Creek	0.76	16.3	Full	23		35		65	WWH	V01P01
0104	McCoy Run	0.55	8	Partial	46			Fair	53.5	WWH	300690
0104	Scioto River	216.67	117	Full	40	8.36	34		46	WWH	610770
0104	Silver Creek	2.32	11.3	Partial	40			Fair	74.5	WWH	V01W27
0201	Rush Creek	39.45	11.8	Partial	32			Good	82.5	WWH	300693
0201	Rush Creek	36.15	14.8	Full	48			Very Good	82	WWH	300694
0201	Rush Creek	26.26	25.7	Partial	43	7.39	48		65.5	WWH	300695
0201	Rush Creek	14.5	50	Full	42	8.12		Marginally Good	79	WWH	300696
0202	McDonald Creek	9.17	2.6	Non	32			Poor	38	WWH	V01K05
0202	McDonald Creek	6.82	6.3	Non	30			Poor	43	WWH	V01W34
0202	McDonald Creek	2.7	12.3	Non	32			Poor	44.5	WWH	203089
0203	Rush Creek	8.8	74	Partial	37	6.26	26		61	WWH	300808
0203	Rush Creek	7.55	74	Full	45	8.48	34		60.5	WWH	300807
0203	Rush Creek	5.39	77	Partial	36	6.70	38		62.5	WWH	V01S01
0203	Rush Creek	0.55	105	Non	28	5.16	28		60	WWH	V01K04
0301	Rock Fork	8.13	7.6	Non	34			Fair	35.5	WWH	V02G03
0301	Rock Fork	1.1	23.1	Non	25	6.26	44		74	WWH	V02P09

**Scioto River (upper) Watershed TMDLs**

HUC12 (last 4)	Stream	River Mile	Drainage area (sq. mile)	ALU attainment	IBI score	MiWB score	ICI score	ICI narrative	QHEI score	ALU designation	STORET
0302	Little Scioto River	25.59	12.8	Non	30			Fair	40.5	WWH	V02G02
0302	Little Scioto River	19.70	33.0	Non	27	5.82		Fair	69.5	WWH	V02G01
0302	Little Scioto River	11.10	47.0	Non	29	4.34		Marginally Good	49	WWH	V02S01
0303	Little Scioto River	9.24	73.0	Non	27	6.26	32		73.5	WWH	V02S13
0303	Little Scioto River	6.50	86.0	Partial	26	5.81	10		31	MWH-C	300624
0303	Little Scioto River	6.24	86.0	Partial	29	6.72	12		34.5	MWH-C	V02W16
0303	North Rockswale Ditch	0.55	10.0	Non	22			Very Poor	49	MWH-C	V02W15
0304	Honey Creek	0.01	7.3	Non	24			Fair	58.5	WWH	V02P11
0304	Little Scioto River	0.39	113.0	Non	28	3.98		Low Fair	45.5	MWH-C	V02P07
0401	Scioto River	211.50	162.0	Full	27	4.75	44		59	WWH	V01S04
0401	Scioto River	210.07	170.0	Full	39	7.75	40		67	WWH	610760
0402	Panther Creek	8.91	7.1	Full	40			Marginally Good	82.5	WWH	V01W28
0402	Panther Creek	7.80	11.0	Partial	30			Marginally Good	75	WWH	300704
0402	Panther Creek	1.80	22.3	Partial	37	6.86		Fair	71.5	WWH	V01W30
0403	Scioto River	207.26	178.0	Full	39	7.88	42		74	WWH	V01W23
0403	Wolf Creek	0.51	12.0	Partial	40			Fair	59	WWH	300691
0404	Wildcat Creek	6.72	4.3	Partial	38			Fair	43.5	WWH	V01W31
0404	Wildcat Creek	4.00	8.4	Full	38			Marginally Good	49.5	WWH	300692
0404	Wildcat Creek	0.49	22.2	Partial	31	7.72	40		84.5	WWH	V01W32
0405	Scioto River	203.36	223.0	Full	41	8.00	48		74.5	WWH	V01S11
0405	Scioto River	196.12	258.0	Full	31	7.66	52		53	WWH	V01S23
0405	Scioto River	192.21	262.0	Full	34	7.68	48		61	WWH	V01W24
0406	Scioto River	186.00	379.0	Partial	32	7.15	46		67	WWH	201831
0406	Scioto River	179.05	407.0	Full	40	8.51	30	Good	71.5	WWH	V01W15
0501	Patton Run	2.25	14.4	Partial	32			Marginally Good	56	WWH	300699
0503	Kebler Run	0.87	14.3	Full	42			Good	83.5	WWH	V02G05
0504	Elliot Run	1.25	2.5	Full	21			Fair	42	MWH-C*	300701
0504	Fulton Creek	16.30	12.5	Non	32			Poor	27	WWH	300700
0504	Fulton Creek	10.35	24.9	Partial	33	7.71	38		76.5	WWH	V02S07

**Scioto River (upper) Watershed TMDLs**

HUC12 (last 4)	Stream	River Mile	Drainage area (sq. mile)	ALU attainment	IBI score	MiWB score	ICI score	ICI narrative	QHEI score	ALU designation	STORET
0504	Fulton Creek	8.70	29.0	Non	41	5.41	32		42.5	WWH	V02S05
0504	Fulton Creek	6.44	40.0	Non	19	4.10	38		50.5	WWH	V02S04
0504	Fulton Creek	1.20	46.4	Partial	39	7.61		Marginally Good	74	WWH	V02S02
0505	Battle Run	0.25	9.4	Full	36			Marginally Good	70.5	WWH	V02G07
0505	Ottawa Creek	0.08	8.0	Full	42			Good	79.5	WWH	V02G06

**Table B-2. Descriptive statistics for the biometric and habitat scores across all survey sites.**

Biometric	Number of sites	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
IBI	62	34.8	7.3	19.0	29.8	35.0	40.0	54.0
MiWB <sup>1</sup>	32	6.86	1.33	3.98	5.93	7.44	7.74	8.51
ICI <sup>1</sup>	29	37.3	10.5	10.0	32.0	38.0	45.0	54.0
QHEI	62	57.8	18.0	18.0	42.9	60.3	74.0	84.5

<sup>1</sup> There are a total of 62 sites that were evaluated for the attainment of aquatic life use goals, but not every one of them had biometric scores available for all three biometrics used.

**Scioto River (upper) Watershed TMDLs**

**Table B-3. Distribution of the listed causes and sources of aquatic life use impairment per site with associated land use classes in the respective 12-digit HUCs.**

HUC12 (last 4)	Stream	River Mile	Sedimentation	Direct Habitat Alterations	Other flow regime alterations	Nutrient/Eutrophication	Phosphorus (Total)	Ammonia (Total)	Dissolved oxygen	Organic Enrichment (Sewage)	Natural Conditions (Flow or Habitat)	Fish Kills	Creosote	Channelization	Agriculture	Municipal Point Source Discharges	Combined Sewer Overflows	Manure Runoff	Natural Sources	Septic / decentralized systems	Woodlot Site Clearance	Sediment Resuspension (Contaminated Sediment)	
0102	Scioto River	231.86	X											X									
0102	Scioto River	224.20	X	X										X	X								
0102	Scioto River	223.05	X	X										X	X								
0104	McCoy Run	0.55								X											X		
0104	Silver Creek	2.32									X									X			
0201	Rush Creek	39.45							X											X			
0201	Rush Creek	26.26	X												X								
0202	McDonald Creek	9.17		X					X	X				X							X		
0202	McDonald Creek	6.82		X		X			X					X	X								
0202	McDonald Creek	2.70		X		X			X					X	X								
0203	Rush Creek	8.80		X	X																	X	
0203	Rush Creek	5.39									X									X			
0203	Rush Creek	0.55									X									X			
0301	Rock Fork	8.13		X		X						X		X	X			X					
0301	Rock Fork	1.10		X		X						X		X	X			X					
0302	Little Scioto River	25.59		X										X									
0302	Little Scioto River	19.70	X												X								
0302	Little Scioto River	11.10	X												X								
0303	Little Scioto River	9.24	X												X								
0303	Little Scioto River	6.50		X					X	X				X			X						

**Scioto River (upper) Watershed TMDLs**

HUC12 (last 4)	Stream	River Mile	Sedimentation	Direct Habitat Alterations	Other flow regime alterations	Nutrient/Eutrophication	Phosphorus (Total)	Ammonia (Total)	Dissolved oxygen	Organic Enrichment (Sewage)	Natural Conditions (Flow or Habitat)	Fish Kills	Creosote	Channelization	Agriculture	Municipal Point Source Discharges	Combined Sewer Overflows	Manure Runoff	Natural Sources	Septic / decentralized systems	Woodlot Site Clearance	Sediment Resuspension (Contaminated Sediment)	
0303	Little Scioto River	6.24		X					X	X				X			X						
0303	North Rockswale Ditch	0.55							X	X							X						
0304	Honey Creek	0.01		X		X									X								
0304	Little Scioto River	0.39						X					X				X						X
0402	Panther Creek	7.80				X									X								
0402	Panther Creek	1.80				X									X								
0403	Wolf Creek	0.51									X								X				
0404	Wildcat Creek	6.72		X		X			X					X	X								
0404	Wildcat Creek	0.49				X									X								
0406	Scioto River	186.00	X												X								
0501	Patton Run	2.25	X												X								
0504	Fulton Creek	16.30		X		X	X		X					X	X								
0504	Fulton Creek	10.35		X		X			X					X	X								
0504	Fulton Creek	8.70		X		X			X	X				X	X	X							
0504	Fulton Creek	6.44		X		X			X	X				X	X	X							
0504	Fulton Creek	1.20				X			X						X								

## B2 Recreation Use Attainment

Recreation use was impaired at 27 of the 29 sites. Over half of the impaired sites exceeded the geometric mean criteria by a factor of at least two times greater. Twenty-five percent of the impaired sites exceeded the criteria by at least three times. All ten of the sites evaluated on the Scioto River failed to meet the criteria; however, seven of these failed by less than a factor of two times the geometric mean criteria. Run off from agricultural areas is suspected as the most common source of bacteria in the Scioto River and its tributaries (i.e., land applied manures and other residues that are sources of *E. coli* bacteria). Bacteria loading from septic systems, urban areas, and combined sewer overflows are also significant. Table B-4 is a list of all of the sites evaluated for recreation uses including the geometric mean and maximum concentration values, attainment status, and possible sources of the bacteria loading. Figure B-5 is a map of the entire project area showing locations where recreation uses were evaluated and the results of the evaluation in terms of achieving the water quality standards.

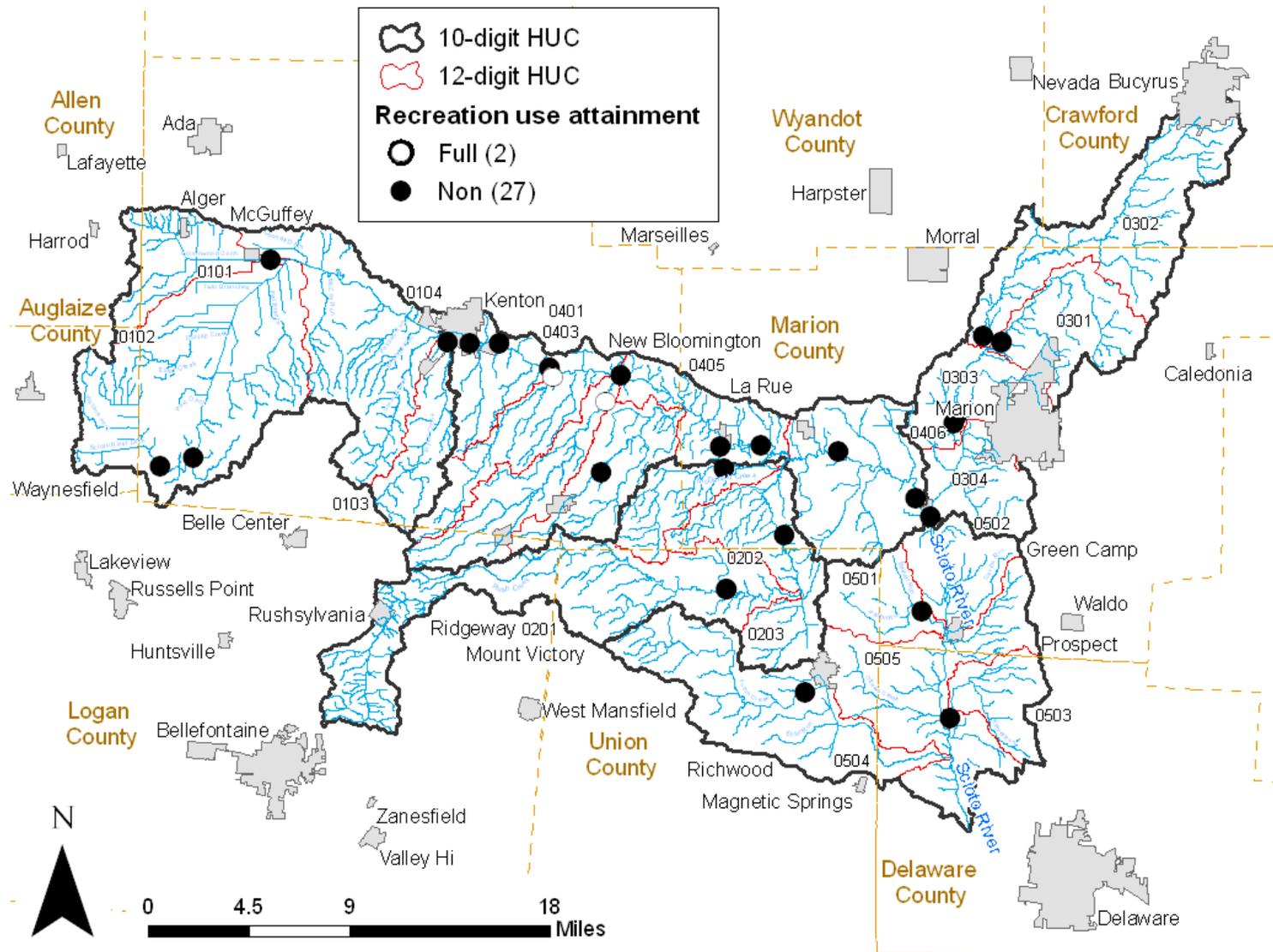
**Table B-4. Recreation use attainment status, *E. coli* concentration statistics, and possible sources of bacteria.**

HUC12 (last 4)	Stream name	River mile	Number of samples	RU designation	Geometric mean	Maximum value	RU attainment status	Possible sources of bacteria
01 01	Cottonwood Ditch	0.68	12	PCR	387	1600	FULL	
01 02	Scioto River	234.4	11	B	324	1100	NON	Ag runoff
01 03	Taylor Cr.	0.76	12	B	228	1600	NON	Septic systems; unsewered area; WWTP (Durez, Sypris); ag runoff
01 04	Silver Cr.	2.32	4	B	358	2400	NON	Ag runoff; ag livestock
02 01	Rush Cr.	14.5	5	B	728	2400	NON	Ag runoff; septic systems
02 02	McDonald Cr.	2.7	5	B	208	820	NON	Ag runoff; ag livestock
02 03	Rush Cr.	5.39	12	B	172	2400	NON	Ag runoff
03 01	Rock Fork	1.1	12	B	262	2400	NON	Ag runoff; ag livestock
03 02	Little Scioto	11.11	12	A	423	2400	NON	Ag runoff; WWTP (Ridgedale Elem.)
03 03	Little Scioto	9.24	5	A	320	980	NON	Ag runoff; WWTP
03 03	Little Scioto	6.5	5	A	680	2400	NON	CSOs; urban (Marion); ag runoff
03 03	Little Scioto	6	5	A	916	2400	NON	WWTP; CSOs; urban (Marion); ag runoff
03 04	Little Scioto	0.4	10	A	270	2400	NON	Ag runoff; ag livestock; WWTP (Harmony Subdiv)

**Scioto River (upper) Watershed TMDLs**

HUC12 (last 4)	Stream name	River mile	Number of samples	RU designation	Geometric mean	Maximum value	RU attainment status	Possible sources of bacteria
04 01	Scioto River	212.5	10	A	322	660	NON	Ag runoff; urban (Kenton)
04 01	Scioto River	210.1	4	A	187	980	NON	Ag runoff; WWTP (Kenton)
04 02	Panther Cr.	1.8	5	B	155	1000	FULL	
04 03	Scioto River	207.3	5	A	170	690	NON	Ag runoff; ag livestock
04 03	Wolf Cr.	0.51	5	B	152	720	FULL	
04 04	Wildcat Cr.	0.49	5	B	1209	1600	NON	Ag runoff; ag livestock
04 05	Scioto River	203.4	5	A	335	650	NON	Ag runoff; WWTP (Eldridge Sta); unsewered area (Hepburn)
04 05	Scioto River	196.1	11	A	238	600	NON	Ag runoff; ag livestock
04 05	Scioto River	192.2	5	A	335	870	NON	Ag runoff; ag livestock; WWTP (LaRue)
04 06	Scioto River	186	5	A	209	610	NON	Ag runoff; WWTP (New Bloomington)
04 06	Scioto River	179.1	5	A	223	400	NON	Ag runoff
05 01	Patton Run	2.25	5	B	380	1800	NON	Ag runoff; ag livestock; septic systems
05 03	Kebler Run	0.87	11	B	191	600	NON	Ag runoff; septic systems
05 04	Fulton Cr.	0.22	11	B	181	1200	NON	Ag runoff; ag livestock; septic systems
05 05	Scioto River	169.2	12	A	85	400	FULL	

**Scioto River (upper) Watershed TMDLs**



**Figure B-5 Spatial distribution of bacteria survey sites and recreation use attainment status.**

### B3 Public Drinking Water Supply Use Attainment

One public water system (Marion - Aqua Ohio) is directly served by surface water sources within the study area. Marion has an intake on the Little Scioto River at RM 7.1 and an intake on the Scioto River at RM 180.04.

Aqua Ohio Marion operates a community public water system that serves a population of approximately 42,000 people through 16,770 service connections. The water treatment system obtains its water from the Little Scioto River, the Scioto River and the Marion Wellfield. The system's treatment capacity is approximately 9.1 million gallons per day, but current average production is 6.74 million gallons per day. Water is pumped from the Scioto and Little Scioto Rivers and 16 ground water wells to the water treatment plant. Approximately one-third of the water is obtained from the wellfield and two-thirds from the two river intakes. Marion's treatment processes include pre-chlorination, aeration, lime softening, coagulation, sedimentation, sand filtration, powdered activated carbon adsorption, fluoridation, and disinfection.

Ohio EPA collected a total of four water quality samples one mile downstream of Marion's intake on the Scioto River in 2009. To assess the PWS beneficial use, samples were analyzed for nitrate but not atrazine, since historically the Scioto River has evidenced far more issues with excessive nitrates than pesticides. Nitrate ranged from non-detect to 2.1 mg/L and averaged 0.53 mg/L. Additional nitrate and pesticide samples are needed to complete a full assessment of the PWS use at this location. Table B-5 summarizes these data as well as data collected at two other sites.

**Table B-5. Results from public drinking water supply water sampling.**

Location	Nitrate-nitrite <sup>1</sup>				Atrazine <sup>2</sup>	
	Mean concentration (mg/l)	Number of samples	Maximum concentration (mg/l)	Number of samples above WQS	Mean concentration (µg/l)	Maximum concentration (µg/l)
Scioto River adjacent Green Camp Rd. (RM 179.05)	0.53	4	2.10	0	No data	No data
Little Scioto River at Marion; upstream of Marion WWTP (RM 6.5)	1.40	6	4.90	0	No data	No data
Little Scioto River at Marion; at SR 309 (RM 7.86)	2.20	1	2.20	0	No data	No data

1 The water quality standard for nitrate+nitrite in areas designated as public water supplies is 10.0 mg/l.

2 The water quality standard for atrazine in areas designated as public water supplies is 3.0 µg/l.

### B4 Human Health Use Attainment

The minimum data requirement for issuing a fish advisory is three samples of a single species. All data from the last five years are included in fish consumption risk assessment calculations. If

## Scioto River (upper) Watershed TMDLs

the data for the last five years are very limited, previous data going back further than five years, but not more than ten years, may be used. For the upper Scioto River in 2009, common carp, channel catfish, and rock bass met the requirement. Channel catfish and rock bass are in the one meal a month advisory category due to mercury contamination. Common carp are in the one meal a week category due to mercury contamination, as well as PCB contamination. In the Little Scioto River in 2009, only common carp met the requirement. Common carp are in the one meal a week advisory category for mercury contamination.

For a listing of fish tissue data collected from the upper Scioto River in support of the advisory program, see Table B-6. The advisory information for the upper Scioto River and Little Scioto River presented in this section differs from the information given in Ohio's fish consumption advisory because of a difference in years of data and sites included in the analysis. The segment of the upper Scioto River referred to in the Ohio fish consumption advisory includes from US 68 in Kenton to Ostrander Road in Warrensburg, and uses data from 2003 through 2009; for this document, only data taken in 2009 from adjacent the Kenton wastewater treatment plant downstream to Green Camp were used. For the Little Scioto River, all fish have a "Do Not Eat" advisory in Marion due to historic polycyclic aromatic hydrocarbon (PAH) contamination, which is not monitored under the fish contaminant monitoring program.

**Table B-6. Select Fish Tissue Data from 2009 upper Scioto River Sampling (mg/kg)**

Year collected	Location	River mile	Species	Mercury	PCBs
2009	Scioto River at LaRue	196.12	Black Crappie	0.165	<0.05
2009	Scioto River at LaRue	196.12	Channel Catfish	0.266	0.117
2009	Scioto River downstream LaRue	192.21	Channel Catfish	0.526	0.132
2009	Scioto River downstream LaRue	192.21	Channel Catfish	0.139	0.226
2009	Scioto River at Green Camp	179.5	Channel Catfish	0.339	<0.075
	<b>Averages</b>			<b>0.318</b>	<b>0.137</b>
2009	Scioto River downstream Creosote Farm	200.5	Common Carp	0.083	<0.075
2009	Scioto River at LaRue	196.12	Common Carp	0.189	0.105
2009	Scioto River downstream LaRue	192.21	Common Carp	0.207	0.102
2009	Scioto River at Green Camp	179.5	Common Carp	0.231	<0.075
	<b>Averages</b>			<b>0.178</b>	<b>0.089</b>
2009	Scioto River at LaRue	196.12	Northern Pike	0.684	<0.05
2009	Scioto River downstream Kenton WWTP	211.1	Rock Bass	0.081	<0.050
2009	Scioto River at LaRue	196.12	Rock Bass	0.258	<0.050
2009	Scioto River downstream LaRue	192.21	Rock Bass	0.332	<0.050
2009	Scioto River at Green Camp	179.5	Rock Bass	0.308	<0.050
	<b>Averages</b>			<b>0.245</b>	<b>&lt;0.050</b>
2009	Scioto River downstream LaRue	192.21	Smallmouth Bass	0.207	<0.050
2009	Scioto River at LaRue	196.12	White Crappie	0.148	<0.050
2009	Scioto River downstream Creosote Farm	200.5	Yellow Bullhead	0.074	<0.050