

**Middle Cuyahoga River Watershed Action Plan  
Section 4P**

**Watershed Photos by Subwatershed**

**2012 Final**



### **Attachment 4P Organization**

4P is organized by subwatershed:

- M (or MS) is Main Stem;
- F (or FC) is Fish Creek;
- PI is Plum Creek;
- B (or BC) is Breakneck Creek
- Po is Potter Creek

At the beginning of the attachment there is an index map of all the photos and a list and description of the photos, slope, channel condition, and page number by subwatershed.

The photos are grouped by main stem or tributary and, to the extent possible, are presented from the downstream (receiving) end and working upstream, toward the source.

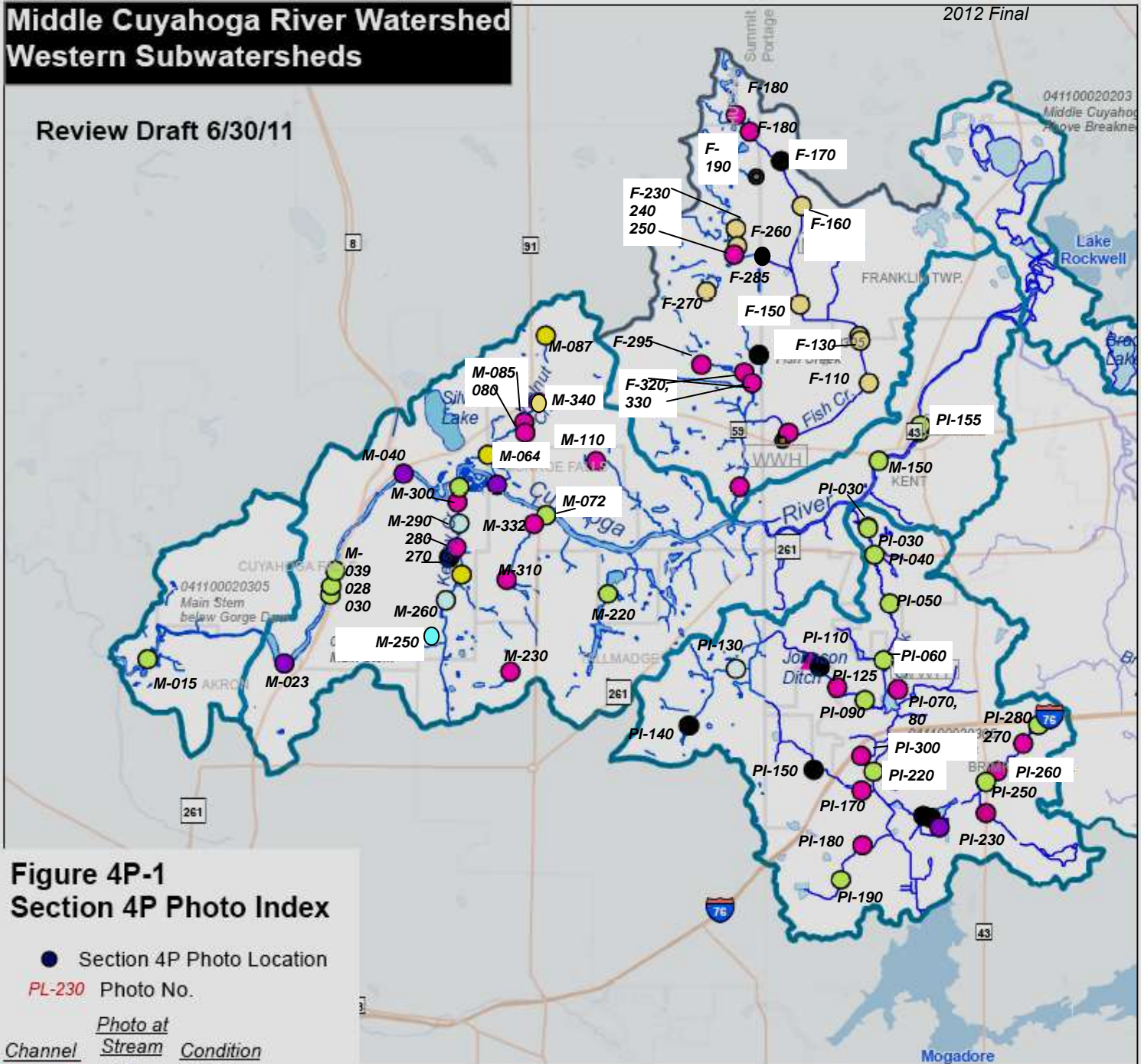
The photo sites are color coded on the index map to reflect observed conditions.



# Middle Cuyahoga River Watershed Western Subwatersheds

2012 Final

Review Draft 6/30/11



**Figure 4P-1  
Section 4P Photo Index**

● Section 4P Photo Location

PL-230 Photo No.

Channel	Photo at Stream	Condition
		Intact
		Recovering
		Eroding (▲ = Livestock Access)
		Channelized
		Altered
		Impounded
	B-360	4P Photo No.

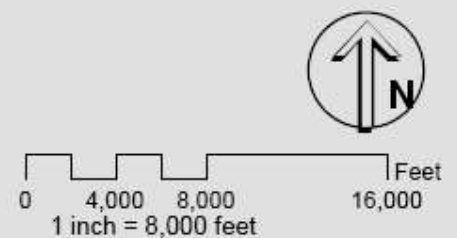
## Subwatershed Abbreviation

MS	Main Stem
F	Fish Creek
PI	Plum Creek
B	Breakneck Creek
Po	Potter Creek

	Streams and Rivers
	Lakes
WWH	Aquatic Life Use Designation
041100020305 Fish Creek	Subwatershed, 12-Digit HUC

	Local Jurisdictions
	Interstates
	State Divided Highways
	Numbered State Routes
	Counties

Not all photograph sites are in 4P. The sites in 4P are labeled.

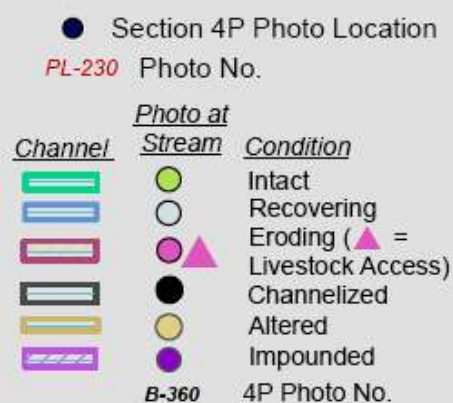




# Middle Cuyahoga River Watershed - Eastern Subwatersheds

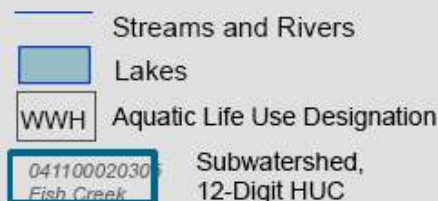
Review Draft 6/30/11

**Figure 4P-1**  
**Section 4P Photo Index**



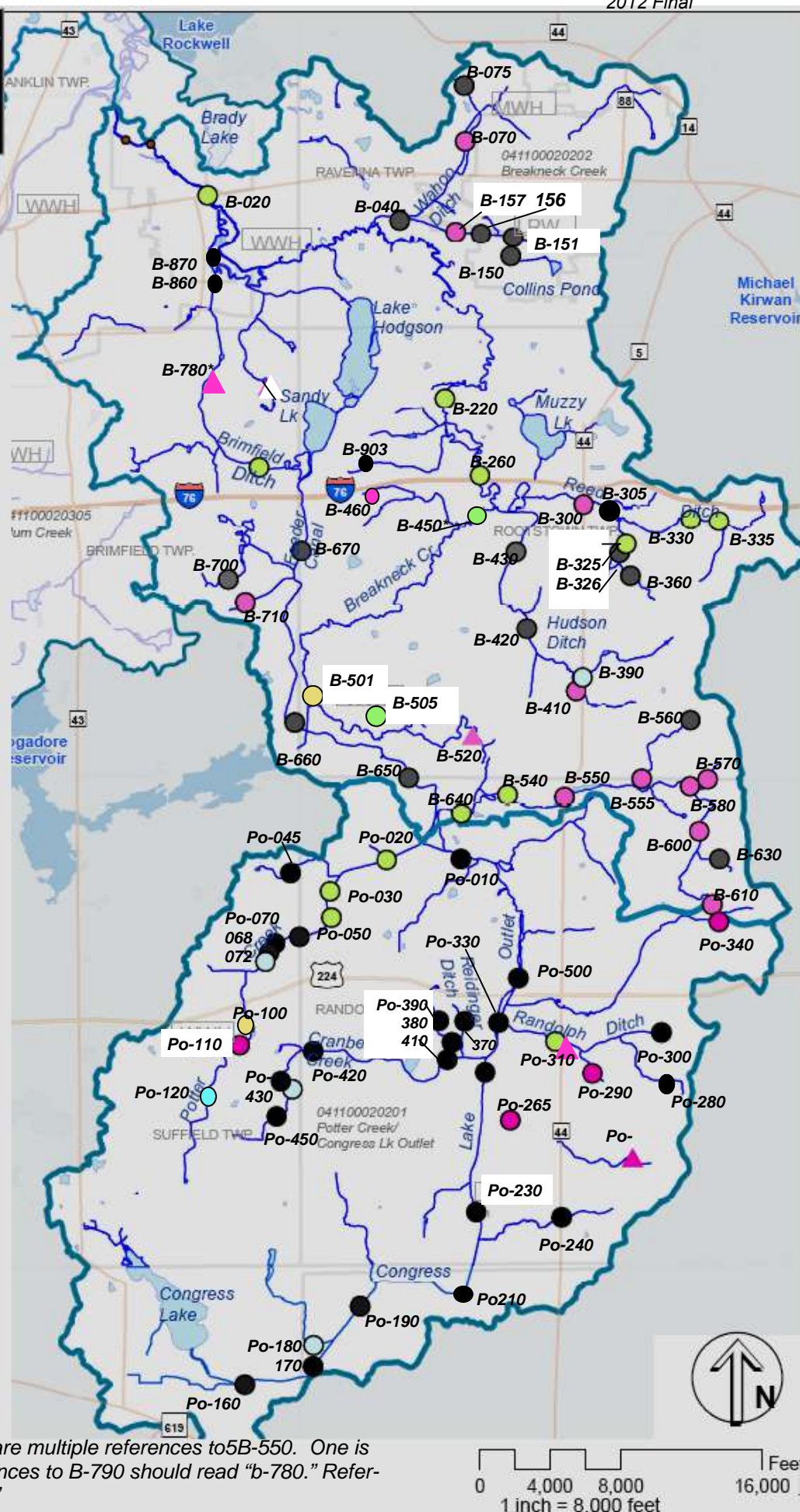
## Subwatershed Abbreviation

MS Main Stem  
F Fish Creek  
PI Plum Creek  
B Breakneck Creek  
Po Potter Creek



Not all photograph sites are in 4P. The sites in 4P are labeled.

**Labeling Errata:** In the text, there are multiple references to 5B-550. One is B-660 (Old Forge Rd.). Any references to B-790 should read "b-780." References to B-45 should read "B-450."





**Table 4P-1 ms Photo Index Main Stem Subwatershed**

<b>4P Photo Number</b>	<b>Page 4P M-</b>	<b>Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example of</b>
MS-015	1	Cuyahoga River	0.28	Intact	Cuyahoga River, intact corridor in Cascade
MS-020	1	Cuyahoga River		Impounded/ intact	Cuyahoga R. Ohio Edison dam and downstream
MS-023	1	Cuyahoga River	0.79	Impounded	Cuy. R. Ohio Edison dam pool impounded
MS-028	1	Cuyahoga River	0.79	Intact	Cuyahoga River in CF Gorge
MS-030	2	Cuyahoga River	0.79	Intact	Cuyahoga River CF Gorge at High Glens
MS-040	2	Cuyahoga River	5.00	Intact	Cuyahoga River expert class rapids
MS-043	2	Cuyahoga River		Impounded	Dams and dam pools, Cuyahoga Falls
MS-057	2	Cuyahoga River	0.09	Impounded	Cuyahoga River dam pool, Cuy. Falls
MS-060	2	Cuyahoga River	0.09	Intact	Cuy. R.- Water Works Pk dam pool but flowing
MS-063	5	Walnut Creek	0.45	Channelized, hardened	Walnut Cr, hardened channel, flooding/bank failure
MS-072	3	Cuyahoga River	0.08	Intact	Cuy R Munroe Falls dam site intact channel
MS-085	5	Walnut Creek	1.60	Eroding	Walnut Creek in park, eroding - runoff vol.
MS-080	5		6.62	Eroding	Walnut Cr. trib, very steep, eroding from runoff
MS-083	1		0.00	Altered, incised	Walnut Cr. headwater urbanized channel
MS-110	6		0.46	Eroding	Eroded headwater trib no buffer
MS-148	3	Cuyahoga River	0.10	Intact	Cuyahoga River intact channel, steep valley, boardwalk Kent
MS-150	3	Cuyahoga River	0.46	Intact,	Cuy R Kent dam site up/downstream
MS-155	3		0.00	Intact	Cuyahoga River near Brady's Leap (rapids)
MS-220	6	Munroe Falls Park tributary	1.18	Intact	Intact stream corridor, Munroe Falls MetroPark
MS-230	4		3.04	Channelized, eroding	Kelsey Cr eroding headwater trib, steep slope, neighborhood runoff
MS-250	4	Kelsey Creek	very low	Intact/ recovering	Low-gradient portion of Kelsey Creek in woods - more intact than other places
MS-260	4	Kelsey Creek	0.50	Recovering	Kelsey Creek - low gradient woods/park
MS-270	4		0.39	Altered, hardened channel	Kelsey Cr. trib - hardened
MS-280	4	Kelsey Creek	0.15	Eroding	Kelsey Cr. eroding/incised in park
MS-290	4	Kelsey Creek	0.23	Recovering	Kelsey Cr. former dam pool
MS-300	4	Kelsey Creek	0.78	Eroding	Kelsey Cr. in Water Works Park - banks eroding
MS-310	6		0.91	Incised	Incised headw trib, slope - 3.4 to 0.9% here
MS-332	6		1.09	Incised	Incised tributary - runoff, steep slopes
MS-340	5			Altered/ culverted	Walnut Creek flowing under building
MS-345	5			Altered/ culverted	Walnut Creek headwater tributary - culverted

<b>Table 4P-1f Photo Index Fish Creek Subwatershed</b>					
<b>4P Photo Number</b>	<b>Page 4P f-</b>	<b>Name</b>	<b>% Slope</b>	<b>Channel conditions</b>	<b>Example_of</b>
f-020	1	Fish Creek	0.25	Intact	Fish Cr. intact corridor WWH non att. 2000
f-050	1	Fish Creek		Channelized	Fish Creek at Route 59 channelized narrow
f-070	1	Fish Creek		Channelized	Fish Cr at Sunrise small wooded buffer, flowing
f-080	2	Fish Creek	0.08	Eroding, channelized, embedded	Fish Cr. - lower (Spaulding) - channelized eroding flooding
f-095	7		0.00		Fish Cr. subwatershed pavement runoff
f-110	2	Fish Creek	0.05	Altered wetland, chnanelized	Fish Cr. channelized, altered wetland
f-130	2	Fish Creek	0.05	Channelized	Fish Cr.- McKinney channelized, altered wetland, flooding problems
f-131	2	Fish Creek	0.05	Altered Wetland	Fish Cr. altered wetland upstream of flood probs.
f-150	3	Fish Creek	0.07	Altered wetland, channelized, embedded	Fish Cr. altered wetland, at Johnson limited flood access
f-160	4	Fish Creek	0.47	Altered wetland, channelized	Fish Cr. altered wetland; woods
f-170	4	Fish Creek	0.17	Embedded	Fish Cr. narrow shrub/grass buffer embedded
f-180	4	Fish Creek	0.38	?	Fish Cr. wooded buffer ?intact channel??
f-190	4	Fish Creek	0.77	Incised	Fish Cr. narrow treed buffer, grass, incised?
f-260	5	Fish Creek	0.30	Channelized	Fish Cr. Newcomer Rd., channelized flooded after heavy rain
f-230	6		0.33	Altered Wetland	Fish Cr. Headwaters altered hydrology & wetland in subdiv.
f-240	6		0.52	Altered Wetland	Fish Cr. Headwaters altered hydrology & wetland in subdiv.
f-250	6		0.07	Incising, eroding	F Cr narrow treed buffer eroding bank intact channel
f-270	6		1.03	Altered Wetland	Fish Cr. Headwaters altered hydrology & wetland in subdiv.
f-285	7		0.28	Channelized	Fish Cr. trib - altered channel, grass banks at HS
f-295	7		0.00	Incising, channelizing	Fish Cr. headwaters - storm drain outflow from plaza
f-320	7		1.30	Incising?	F Cr headwater trib in subdiv. grass/shrub banks/buff
f-330	7		0.19	Incising	F Cr headwater trib in subdiv. eroding mown
f-360	7			?Intact?	Fish Creek headwater with narrow buffer



**Table 4P-1pl Index Map Plum Creek Subwatershed**

<b>4P Photo Number</b>	<b>Page 4P PI-</b>	<b>Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example_of</b>
PL-030	1	Plum Creek	?	Intact - restored	Plum Creek restoration
PL-040	1	Plum Creek	0.56	Intact/starting to erode?	Plum Creek intact corridor
PL-050	1	Plum Creek	0.14	Intact	Plum Creek intact corridor
PL-060	1	Plum Creek	0.52	Intact	Plum Creek in wetlands at Howe by subdiv.
PL-070	1		0.00	Eroding	development and erosion - Pleasant Lakes
PL-080	1	Lake			View of Lake in Pleasant Lakes development, receives water from all ditches
PL-090	2	Johnson Ditch	1.98	Intact	Johnson Ditch intact corridor
PL-100	2	Johnson Ditch		Channelized	Channelized Johnson Ditch, minimal to good buffer
PL-105	2	Johnson Ditch	0.34	Eroding	Johnson Ditch high flow, woods, ag field erosion
PL-110	3	Johnson Ditch	0.34	Channelized - livestock	J Ditch channelized unrestr livestock access
PL-115	2	Johnson Ditch	0.34	Channelized	Johnson Ditch narrow buffer from industrial site
PL-130	3	Johnson Ditch	0.29	Channelized/r ecovering	J Ditch, JayCee park, in wetl culverted both ends
PL-140	3	Johson Ditch	0.29	Channelized	Johnson Ditch headw in subdiv by det basin
PL-150	4		0.48	Channelized	Johnson Ditch as roadside ditch
PL-170	4		0.27	Eroding	J Ditch s eroding bank by building
PL-180	4		0.48	Incised, eroding	Plum Cr trib eroding stream no buffer golf course
PL-190	4		0.55	Intact	Plum Cr headw trib intact corridor
PL-210	5		0.30	Channelized	Plum Cr trib channelized by subdiv
PL-215	5		0.34	Channelized	Plum Cr headwater - channelized
PL-220	4	Plum Creek	0.44	Intact	Plum Creek intact corridor
PL-225	5		0.00	Impounded	Private impounded lake
PL-230	5		2.48	Eroding, channelized	Plum Cr tributary eroding min-no buffer
PL-250	6		0.41	Intact	Plum Creek trib - Wetland mitigation area
PL-260	6		0.41	Eroding, channelized	Plum Cr. headw trib eroding infrastructure
PL-270	6		0.41	Eroding	Plum Cr trib streambank erosion in development
PL-280	6		0.45	Intact	Plum Cr headw trib intact sm-wide wooded buff
PL-300	4		0.07	Eroding	Plum Cr trib flows through topsoil/mulch piles

<b>Table 4P-1 B Photo Index Breakneck Creek Subwatershed</b>					
<b>4P Photo Number</b>	<b>Page 4P b-</b>	<b>Stream Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example_of</b>
B-020	1 & 2	Breakneck Creek	0.28	Intact altered buffer	B. Cr. intact channel, narrow wooded buffer, urban
B-045	1	Breakneck Creek		Intact	Breakneck Creek at Rootstown, intact, wetlands, spring floods
B-040	9	Wahoo Ditch	0.13	Channelized	W. Ditch, channelized, overgrown non-attain
B-055	9	Wahoo Ditch		Channelized	Wahoo Ditch
B-070	9	Wahoo Ditch	0.04	Channelized, eroding	W Ditch channelized eroding sod banks, urban/woods, area with flooding problems
B-075	9	Wahoo Ditch	0.22	Channelized	
B-150	10	Hommon Ave. Ditch	0.18	Channelized	Hommon Ave. Ditch LRW narrow channelized gr buffer
B-151	10	Collins Pond Outlet	0.11	Altered/culverted	Altered hydrology culverted channelized
B-156	10	Hommon Ave. Ditch	0.00	Channelized	Hommon Ave. Ditch channelized, grass buffer
B-157	10	Hommon Ave. Ditch	0.00	Channelized, eroding	Hommon Ave. Ditch eroding channelized
B-160	10	Collins Pond Outlet	0.11	Altered/culverted	Collins Pond Outlet/Hommon Ave. Ditch, altered, channelized, culverted
B-170	11	Collins Pond		Altered wetland	Vicinity of Collins Pond
B-180	11	Collins Pond		Altered wetland	
B-220	2	Breakneck Creek	0.02	Intact	Breakneck Cr. intact floodplain, flooding
B-260	2	Breakneck Creek	0.03	Altered, eroding grass/no buffer	Altered eroding grass bank/buffer, could be influenced by Hudson/Reed Ditches upstream
B-300	6	Reed Ditch	0.05	Channelized, incised	Reed Ditch channelized incised large volume
B-305	6	Reed Ditch		Channelized	Reed Ditch channelized
B-325	7	Reed Ditch	0.23	Channelized	Reed Ditch s. trib tall grass banks/buffer
B-326	7	Reed Ditch	0.23		Reed Ditch s. trib. wooded buffer
B-330	6	Reed Ditch	0.36	Intact?	R. Ditch small headwater grass/tree buffer good flow
B-335	6	Reed Ditch	0.36	?	R. Ditch small headwater grass/tree buffer
B-360	7	Reed Ditch	1.49	Altered/channelized	R. Ditch channelized mown swale plus detention basin
B-390	5	Hudson Ditch	0.95	Recovering	Hudson Ditch narrow shrub buffer embedded
B-410	5	Hudson Ditch	0.62	Incised	Incised headwater stream mown grass banks
B-420	5	Hudson Ditch	0.04	Channelized	Hudson Ditch channelized, grass banks



**Table 4P-1 B Photo Index Breakneck Creek Subwatershed**

<b>4P Photo Number</b>	<b>Page 4P b-</b>	<b>Stream Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example of</b>
B-430	5	Hudson Ditch	0.09	Channelized, incised	Hudson Ditch channelized, embedded, buffer woods/grass
B-460	13			Eroding	Headwater tributary eroding, no buffer
B-501	2	Breakneck Creek	low	?	Breakneck Cr at Old Forge Rd. No buffer.
B-505	13			Intact? No buffer	Headwater tributary at Old Forge no buffer
B-520	2	Breakneck Creek	0.10	Eroding, livestock	Breakneck Cr altered eroded grass bank in livestock yard
B-540	1	Breakneck Creek headwater tribs	0.26	Intact	B Cr intact headwater channel in wetland
B-550	3	Breakneck Creek headwater tribs	0.31	Intact	B Cr Intact wetland below headwater tribs
B-555	3	Breakneck Creek headwater tribs	1.27	Channelized	B Cr headw. tribs channelized eroding grass banks
B-560	3	Breakneck Creek headwater tribs	1.27	Eroding	B Cr headw tribs eroding banks buffer-ag/wet/woods
B-575	3	Breakneck Creek headwater tribs	0.70	Eroding	View of eroding stream in field along Wilkes
B-580	4	Breakneck Creek headwater tribs	2.35	Eroding, channelized	B Cr headw tribs eroding banks volume channelization
B-600	4	Breakneck Creek headwater tribs	0.67	Eroding	B Cr headw trib eroding banks sm. grass/woods buff
B-610	4	Breakneck Creek headwater tribs	0.96	Eroding/incising	B Cr headw trib eroding mown grass banks
B-630	4	Breakneck Creek headwater tribs	1.61	Channelized	B Cr headw trib grass/ag banks/buffer
B-640	1	Breakneck Creek	0.00	Intact buffer - channelized? ?	Congress Lake Outlet/Potter Cr. Upstream of confluence, intact corridor, wetlands
B-650	12	Feeder Canal	0.04	Channelized	Feeder Canal, ditch small treed buffer in res/ag use
B-660	12	Feeder Canal	0.04	Channelized	Feeder Canal mown grass banks/buffer
B-670	12	Feeder Canal	0.13	Channelized	Feeder Canal channelized narrow treed buffer

**Table 4P-1 B Photo Index Breakneck Creek Subwatershed**

<b>4P Photo Number</b>	<b>Page 4P b-</b>	<b>Stream Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example_of</b>
B-700	13	Feeder Canal	0.69	Eroding, altered banks	Feeder Canal headw trib eroding turbid grass banks
B-710	13	Feeder Canal	0.59	Eroding	Feeder Canal headw trib eroding trubid grass banks
B-740	8	Brimfield Ditch	0.27	Intact	Brimfield Ditch intact vegetated buffer
B-780/790	8	Brimfield Ditch		Eroding, channelized, livestock	Brimfield Ditch livestock access channelized no fp
B-860	8	Brimfield Ditch		Channelized	Near water treatment plant - no buffer one side
B-870	8	Brimfield Ditch		channelized	Good buffer
B-903	13			channelized	Headwater tributary channelized, small buffer



**Table 4P-1 po Photo Index Potter Creek Subwatershed**

<b>4P Photo Number</b>	<b>Page 4P Po-</b>	<b>Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example_of</b>
Po-010	4	Congress Lake Outlet	0.14	Channelized	CLO/Potter Creek at Johnnycake Rd. floods, resid. area
Po-020	1	Potter Creek	0.04	Intact channel/ embedded	Potter Cr. lower at confluence of CLO- intact in wetland
Po-030	1	Potter Creek	0.15	Intact	Potter Cr. - lower -Randolph Rd. in wetland
Po-040	1		0.13	Channelized	Potter Cr. trib channelized grass buffer
Po-045	1			Channelized	Potter Cr. Trib channelized no buffer
Po-050	1	Potter Creek	0.15	Intact	Potter Cr. at Trares Rd. in wooded buffer WWH partial
Po-060	1	Potter Creek	0.15	Embedded	Potter Cr. - at Conley Rd. in buffer, embedded, ditch upstream
Po-068	2	Potter Creek	0.16	Channelized	Large, diverse wetland buffer on Potter Creek, contiguous to easement
Po-070	2	Potter Creek	0.16	Channelized/ embedded	Potter Cr. ditch embedded prop. overwide site
Po-072	2	Potter Creek	0.16	Recovering/ intact	Potter Cr. recovered section in woods immediately upstream of demo site
Po-100	2	Potter Creek	0.44	still intact?	Potter Creek at Waterloo Rd. no buffer/treed buffer
Po-110	3	Potter Creek	0.44	Recovering	Potter Cr. at Shaffer, livestock fence, recovering
Po-111	3	Potter Creek	0.44	Eroding incising	Potter Creek bank erosion downstream of fenced cattle yard eroded during floods (2003?)
Po-120	3	Potter Creek			Potter Creek at Steffy Rd. varied buffer
Po-160	5	Congress Lake Outlet	0.12	Channelized embedded weedy	Upper Congress Lake Outlet (CLO) at Swamp Rd. - summer, weedy
Po-170	5	Congress Lake Outlet	0.05	Channelized eutrophic	CLO, upper - algae filled
Po-180	9		0.49	Recovering in channel	CLO tributary - recovering in channel
Po-190	5	Congress Lake Outlet	0.05	Channelized, embedded	CLO - upper, steep sided channel, silted in
Po-210	5		0.16		CLO, upper reaches, narrow channel and buffer
Po-230	5	Congress Lake Outlet	0.07	Channelized	CLO upper reaches good flow
Po-240	9		0.00	Channelized	Potter Cr/CLO tributary varying grass buffer
Po-250	9		0.70	Eroding, incising, livestock	CLO trib incised unrestricted livestock access
Po-265	9		0.00	Eroding, incising	CLO tributary incised in woods - upstream effects
Po-280	8			Channelized	Randolph Ditch tributary - channelized roadside ditch
Po-290	8	Randolph Ditch	1.17	Eroding, incising	Randolph Ditch trib. some buffer, incised, intact
Po-300	8	Randolph Ditch	0.45	Channelized	Randolph Ditch trib minimal buffer channelized

**Table 4P-1 po Photo Index Potter Creek Subwatershed**

<b>4P Photo Number</b>	<b>Page 4P Po-</b>	<b>Name</b>	<b>% Slope</b>	<b>Channel Condition</b>	<b>Example_of</b>
Po-310	8	Randolph Ditch	0.12	Eroding, livestock	Randolph Ditch unrestricted livestock access
Po-311	8	Randolph Ditch	0.12	Intact	Randolph Ditch downstream of Rte 44 livestock small buf
Po-320	4	Congress Lake Outlet	0.07	Channelized	CLO - wooded buffer
Po-330	4	Congress Lake Outlet	0.11	Channelized	CLO at Alexander Rd., confluence Randolph Ditch grassed/wooded buffer
Po-340	9		0.41	Incising/ Intact/ altered	CLO tributary intact in woods, incised where no buffer
Po-341	9		0.41	Incising/ Intact/ altered	CLO tributary intact in woods, incised where no buffer
Po-370	7	Reidinger Ditch	0.21	Channelized	Reidinger Ditch grass buffer, channelized, tiled
Po-380	7	Reidinger Ditch	0.46	Channelized	Reidinger Ditch, grassed buffer, channelized
Po-390	7	Reidinger Ditch	0.46	Channelized	Reidinger Ditch narrow grass buffer in ag
Po-410	6	Cranberry Creek	0.12	Channelized	Cranberry Cr. tiled ditch small buffer
Po-420	6	Cranberry Creek	0.09	Channelized	Cranberry Creek channelized, small grass buffer
Po-430	6	Cranberry Creek	0.00	Channelized	Cranberry Cr. extensively channelized minimal buffer
Po-440	6	Cranberry Creek	0.28	Recovering	Cranberry Creek minimal buffer from ag recovering
Po-450	6	Cranberry Creek	0.28	Channelized	Cranberry Cr. in residential area min. buffer
Po-500	4	Congress Lake Outlet	0.04	Channelized	CLO lower end - Waterloo Rd., spring floods no flooding; wooded buffer

## Middle Cuyahoga River—Lower end to Gorge; Dam Pools—Non-attainment WWH criteria



**MS-015** Cuyahoga River at Cascade MetroPark, Oct., 2010.



**MS-020** Below and at Ohio Edison Dam; July, 2009.



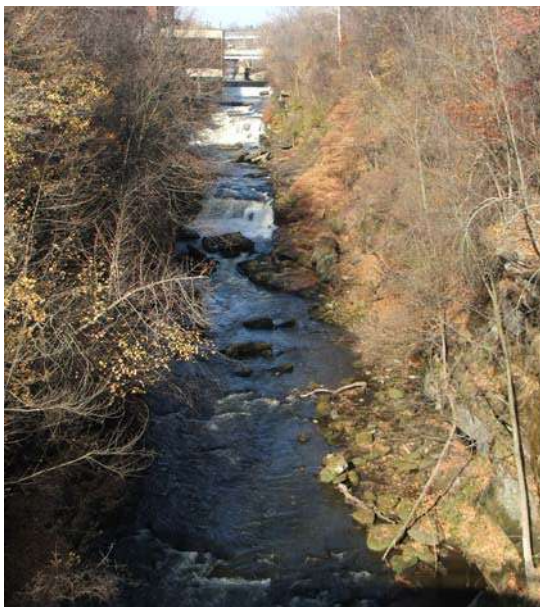
**MS-023** Ohio Edison dam pool at Gorge Rd; July, 2009.



**MS 028** Cuyahoga River in the Gorge between top of the dam pool and Overlook. July, 2009.



## Cuyahoga River Main Stem—Gorge and Low-Head Dam Pools



**MS-030** Gorge up- and downstream of High Glens overlook, Cuyahoga Falls gorge. Low-head dam pools are in far background of left picture. New High Glens Park boardwalk visible in right-hand photo.. Nov., 2009.



**MS 040** Expert-class rapids at Sheraton below lower-most low-head dam at Broad St., July, 2009.



**MS 043** View of two remaining low-head dam pools and upper-most dam in Cuyahoga Falls from Cuyahoga Falls riverfront walk. July, 2009.



**MS-057** Upper dam pool at Oak Park Ave.



**MS-060** Cuyahoga River at Water Works Park, on a double meander on a low-lying sand/gravel deposit. Park floods during high water. Near public water supply. June, 2011, Mar., 2004.



## Middle Cuyahoga River Restored Section—Munroe Falls to —Kent



**MS-072** View of river and rapids at reconstructed dam abutment at Brust Park where the Munroe Falls dam was removed. May, 2008. Pic. 9192.



**MS-148** Cuyahoga River boardwalk trail, Kent. Steep-sided valley walls apparent to left. This is a typical view of the Middle Cuyahoga between Munroe Falls and Kent. Mar., 2009.



**MS-150** Left: View from Main St. bridge looking downstream to Kent dam. River flows through sluiceway, and the historic dam has been retained as a park. Right: View downstream of the park on the dam. June, 2011, Nov. 2010.



**MS-150** Cuyahoga River upstream of dam and bridge. May, 2010.



**MS-155** Cuyahoga River near Brady's Leap, Kent. October, 2010



## Kelsey Creek



**MS-300.** Kelsey Creek in Water Works Park. The channel is gravelly. Erosion, which may be threatening the bridge, may be due to high volumes. June, 2011.



**MS-290** Kelsey Creek, former dam pool. June, 2011.



**MS 280, 270** Kelsey Creek in Kennedy Park lacks a functional riparian corridor and is eroding its banks, partially due to excess stormwater from altered stream corridors and impervious surfaces in neighborhoods. The sediment and channel erosion degrade the stream habitat. Many streams in the Main Stem subwatershed are altered. Spring, 2011, Summer, 2010.



**MS 250, 260** Kelsey Creek is generally low-gradient and is most intact within woods.. (Center) Even a low-gradient portion like this through Galt Park is incising, showing evidence of overloading. Summer, 2010.



**MS-230** Stormwater runoff from a Tallmadge neighborhood contributes to overloading the creek and water quality problems.. This is one of the few steep slopes along Kelsey Cr. Spring, 2004.



## Walnut Creek



**MS-063** Developments on wetlands and floodplains require bulkheads to hold the channels in place. Oct., 2009.



**MS-085** Walnut Creek in Adell Durbin Park has a wooded buffer but is eroding from excess stormwater. Oct., 2009.



**MS-080** Steep slopes contribute to the erosive force of the water. Oct., 2009.



**MS 340, 345** Headwater tributaries to Walnut Creek have been severely altered. Culverted tributaries flow beneath the pavement and sod. The tributary on the right emerges in the background behind the houses. Summer, 2010; Spring, 2011



## Other Main Stem Sub-watershed Tributaries

While a few of the headwater tributaries in the Main Stem subwatershed have intact riparian environments, many have been altered or otherwise affected by excess runoff and steep slopes. Some headwater tributaries became incised at the river when the Munroe Falls dam and river base level were lowered.



**MS-110** Unnamed Tributary, Charring Cross Rd., July, 2010.



**MS-220.** Munroe Falls MetroPark Creek appears to be an intact, high-quality stream with gravel substrate, riparian zone, wooded riparian buffer, variable flow. August, 2010.



**MS-310, 332.** Unnamed tributary that flows past Munroe Falls City Hall. The entire length is incised, apparently overloaded by runoff from neighborhoods and steep slopes.





## Fish Creek—Main Stem WWH (Non-Attainment)



**FC-020** Fish Creek n. of N. River Rd. Nov., 2009, June, 2011



**F-50** Fish Creek at Rte 59, June, 2011



**F70** Fish Creek at Sunrise Rd. June, 2011.



### Fish Creek Kent—MWH In Attainment

This portion of Fish Creek is known for flooding problems, receiving excess storm water from upstream.



**FC-080** Fish Creek at Spaulding, spring floods on right. Note proximity of flood waters to buildings and partially submerged utility pole, eroding banks, lack of floodplain access. Nov., 2010, March 2011



**FC-110** Fish Creek at Fairchild Nov., 2010



**F-130** McKinney Ave. flooding Mar, 2011



**FC-130** McKinney Ave. Playground (left) is converted wetland adjacent to Fish Creek; Fish Creek channel (center); channelized wetland upstream of playground/flooding site (right). Nov., 2010.



**Fish Creek at Johnson Rd.**

**FC-150** Fish Creek at Johnson Rd. This area provides a clear example of the effect of channelizing Fish Creek through former wetlands. The poorly draining soils pond the water, but the creek has limited access to floodplains, and the flood water is not being stored or treated within the soil and roots of the wetland. Photos taken during July, 2010 (top left), November, 2010 (middle), March floods, 2011 (bottom).





## Fish Creek, Northern Portion



**FC-160** Fish Cr. At Spell Rd. – altered wetland Nov., 2009.



**FC-170** Fish Creek at Judson Rd., July, 2009.



**FC-180** Fish Creek by Ravineview, Nov. 2009.



**FC-190** Fish Creek at Barlow Rd. Nov., 2010



**Fish Creek Tributary at Newcomer Rd.**

**FC-260** Newcomer Rd after heavy rain, April, 2011. There have been reports of this road flooding, and the flattened vegetation suggests possible over-topping of the road. The narrow channelized stream is apparent under the floodwater in the fourth picture. This road receives drainage from several subdivisions on top of the hill to the east, which all have severely altered hydrology.



## Fish Creek Headwaters flowing to Newcomer

This tributary system has been highly altered.



**FC-230** Fish Creek at Rose Mallow Rd., Nov. 2009, July, 2010.



**FC-240** Fish Creek at Bluestem in altered wetland. Nov., 2009.



**FC-270** Fish Creek at Wexford Rd. July, 2010.



**FC-250** Fish Creek headwater at Young Rd., July 2010.





### Lower Fish Creek Headwater Tributaries

These few photos are typical of residential and commercial development in the lower portion of the Fish Creek watershed, both in Stow and Kent. Although some landscape features have been preserved, most of the riparian landscape is highly altered. However, there are many homeowners' association parcels and large properties (e.g., the Stow-Munroe Falls high school), where willing property owners could improve the riparian landscape or infiltrate stormwater.



**F-320, F330** Remaining stream in developed area, Edgewater neighborhood. In areas like these, enhancing the narrow riparian area with shrubs, tall grasses, or trees, could reduce the risk of erosion. Nov., 2009.



**F-360** Stream channel off Fish Creek Rd & Greenlawn – some buffer Nov., 2009.

**F-295** Drainage from a shopping plaza at Graham & Fishcreek is a headwater of Fish Creek Nov. 2010, June, 2011.



**FC-095** Route 59 (above), Fish Creek Rd., and Graham Rd. in Stow and Kent are heavily developed with commercial uses, roads, and, parking lots, which drain to Fish Cr. Nov., 2010.



**FC-285** Modified stream channel, Fish Creek tributary at Stow-Munroe Falls High School. July, 2010



### Plum Creek—WWH In Attainment, 2000

Similar to Breakneck Creek, much of the Plum Creek main stem corridor is relatively intact, with wetlands, floodplains, and wooded buffers protecting the stream. However, much of the Plum Creek subwatershed was undergoing rapid development prior to the economic downturn that began in 2007-2008 and is likely to face development pressure again. As with Breakneck Creek, the headwater tributaries are more altered than the main stem.



**PI-025**, 030 Plum Creek Park, restored stream; Nov., 2010.



**PI-040** Plum Creek upstream of Route 261 April, 2011.



**PI-050** Plum Creek at Sunnybrook Rd.



**PI-060** Plum Creek at Howe Ave. April, 2011.



**PI-060** View from railroad tracks across Plum Creek/ wetland to Pleasant Lakes subdivision during flood March, 2009



**PI-070, PI-080** Pleasant Lakes development, with view of lake. The lake receives water from all Plum Creek tributaries/ditches. March, 2009



## Johnson Ditch

Portions of Johnson Ditch flow through intact stream corridors; others have been altered.



**PI-090** Johnson Ditch at Sunnybrook, March 2009 & May, 2011.



**PI-105** Johnson Ditch at Mogadore Rd. Roadside ditch carrying sediment to Johnson ditch March, 2009.



**PI-100** Plum Creek/Johnson Ditch Mogadore Rd March, 2009



**PI-125** Johnson Ditch crosses industrial property at Howe.



## Johnson Ditch



**PI-110** Johnson Ditch at Howe Ave. across (upstream) from Crystal Rd., April, 2011



**PI-130** Plum Creek/Johnson Ditch @ JayCee Park Howe Ave. in large wetland complex. Upstream ends culverted under park, agricultural land. April, 2011



**PI-140** Head of Johnson Ditch below Tallmadge High School with extended detention basin for schools, Recreation Center.



## Plum Creek Tributaries South of Pleasant Lake



**PI-220** Plum Creek at Tallmadge Rd. east of Sunnybrook Rd. Nov., 2009



**PI-300** Plum Creek tributary at I-76 on Sunnybrook



**PI-170** Johnson Ditch (south)) at Sunnybrook Note eroding bank by building. Nov., 2009



**PI 150** Johnson Ditch (south)) at Tallmadge Rd.



**PL-180** Plum Creek tributary in golf course on Sunnybrook Rd., near the Portage County wellhead 5-year time of travel zone. Nov., 2009



**PI-190** Plum Creek tributary at Old Forge Rd. Nov., 2009



## Plum Creek Southern Tributaries



**PI-210 and 215** Plum Creek headwater in Lor Run neighborhood, March, 2009.



**PI-225** private lake near Irish and Dussell Rds.



**PI 230** Southern tributary on SR 43, April, 2011



## Plum Creek Tributaries at Brimfield Center



**PI 250** Plum Creek northern tributary SR 43, Brimfield Center, restored wetland, Nov. 2009



**PI-260** Plum Creek enters Brimfield Center/Tallmadge Rd. from upstream with erosive force.



**PI 270, 280** Plum Creek @ Brimfield Crossings pics Nov., 2009



### Breakneck Creek (WWH, generally in attainment)

From its lower (more urbanized) end in Kent to its headwaters, this low-gradient, sinuous “swamp creek” flows through nearly continuous bands of woods, wetlands, and floodplains, which hold back floods, provide habitat and shade, and buffer the creek from impacts. Breakneck Creek begins where its headwater tributaries coalesce and then join with Congress Lake Outlet/Potter Creek (bottom pictures). The tributaries are more altered than the creek.



**B-020** Breakneck Creek at Route 59 very narrow buffer May 2008.



**B-045** Breakneck at Rootstown Rd. during May high waters, with what appears to be silt in the thalweg, flanked by wetlands May 2011



**B-640** Congress Lake Outlet/Potter Creek at Johnnycake upstream of confluence, May 2011.



**B-540** Breakneck Creek at Hartville Rd. – headwater tributaries upstream of Congress Lake Outlet/Potter Creek confluence, May 2011



## Breakneck Creek Wetlands, Floodplains, Riparian Corridor

While most of Breakneck Creek is flanked by wetlands, floodplains and forested riparian buffer (B-220, top left) , at a few areas near road crossings, the wooded riparian environment has been altered.



**B-220** Breakneck Cr. At Sandy Lake Rd. BC 220 Nov., 2009.



**B-020** Breakneck Creek at Route 59. Very narrow buffer May, 2008.



**B-520** Breakneck Creek at Old Forge/Kline – Eroded bank from livestock access (fenced chute?), July, 2010.



**B-501** Breakneck Cr. At Old Forge Rd., Nov., 2009.



**B-260** At several road crossings, residents near the water have cleared the riparian buffer to the water's edge. In this case, there appears to be a storm pond embankment adjacent to the river, which is eroding. Breakneck Creek at Lynn, downstream of Reed & Hudson Ditches, April, 2011



### Breakneck Creek Headwater Tributaries (upstream of Congress Lake Outlet)



**B-550** Breakneck headwaters, mostly incised, flow into a pond and this wetland at Route 44, below which the channel appears to be intact. The downstream effects of the sediment loads have not been determined. April, 2011. Pic 24891.



**B-560** New Milford Rd. Farm field eroding directly into roadside ditch/headwater tributary. April, 2011. Pic. 24870



**B-555** Northern headwater tributary at Wilkes. April, 2011. pics 24881, 83



**B-575** view of incising stream from Wilkes April, 2011. (Misnumbered as 580)



## Breakneck Creek Headwater Tributaries (above Confluence with Congress Lake Outlet)



**B-580** Breakneck headwater tributary, Wilkes Rd. (slope 2.3%) Banks are eroding. April, 2011.



**B-580** Mixed buffer and substrate. July, 2010.



**B-610** Small tributary, Fairground Rd..



**B-630** Headwater tributary at New Milford Rd., April, 2011.



**B-600** Breakneck headwaters at Bassett. Even the portion in the woods is eroding. April, 2011.





# Breakneck Creek—Hudson Ditch



**B-430** Hudson Ditch at Tallmadge Rd. Nov. 2009.



**B-420** Modified stream channel, Hudson Ditch, Bower Rd. July, 2009.



**B-420** Hudson Ditch, Bower St. July, 2009.



**B-390** Hudson Ditch Rte 44 July, 2009.



**B-410** Modified stream channel, Hudson Ditch, Hartville Rd. Nov. 2009



## Reed Ditch and Eastern tributary

Reed Ditch starts as a small headwater tributary but increases in size to a wide, deeply-incised chasm at its downstream end, due to large volumes of water from the watershed. There appears to be room along Reed Ditch to restore flood storage or other watershed functions.



**BC-300** Reed Ditch at Rte 44 – carries huge volume. June, 2010, pics 5306, 5311



**B-305** Reed Ditch main stem, neighborhood east of SR 44, June, 2010



**B-330** Reed ditch eastern end, New Milford Rd, June, 2010.



**B-335** Upstream/eastern end Reed Ditch at Hafrick, June 2010



## Reed Ditch—southern tributary



**B-325** Reed Ditch southern tributary. Cemetery east of Rte 44 June, 2010.



**B-326** Reed ditch same as BC 325 but toward back of the cemetery. June, 2010.



**BC-360** Reed Ditch s. of Tallmadge Rd. June, 2010.



Wetland (dark blotchy area) at confluence of Reed and Hudson Ditches. This wetland may be helping buffer the effects of the ditches on Breakneck Creek immediately downstream.

The yellow lines are property lines.

Source: Portage County GIS, 2011, using 2006 aerial photograph.



## Brimfield Ditch



**BC 870, 860** Brimfield Ditch North of Summit Road July, 2010



**B-740** Brimfield Ditch at Sandy Lake Rd. Nov. 2009.



**B-780** Brimfield Ditch at Meloy. Upper left two photos, November and March, 2009. Right, 2006 aerial photo of Brimfield Ditch, which appears to be channelized, at Meloy Rd..



## Wahoo Ditch—MWH, Not Attaining



**BC-040** Wahoo Ditch at Sandy Lake Rd., Aug., 2009



**B-055** Wahoo Ditch at Bridge St. & Rte. 59 Feb., 2009 Pics Misnumbered as **550**



**B-070** Wahoo Ditch - Trailer Park - Jones Rd., Feb., 2009.



**B-75** Wahoo Ditch at Wall St. near Infirmary . Feb., 2009.



**B-070** Wahoo Ditch—Trailer Park, Jones Feb, 2009.







**B-150, BC-160** Collins Pond Outlet at Diamond Rd. May, 2011

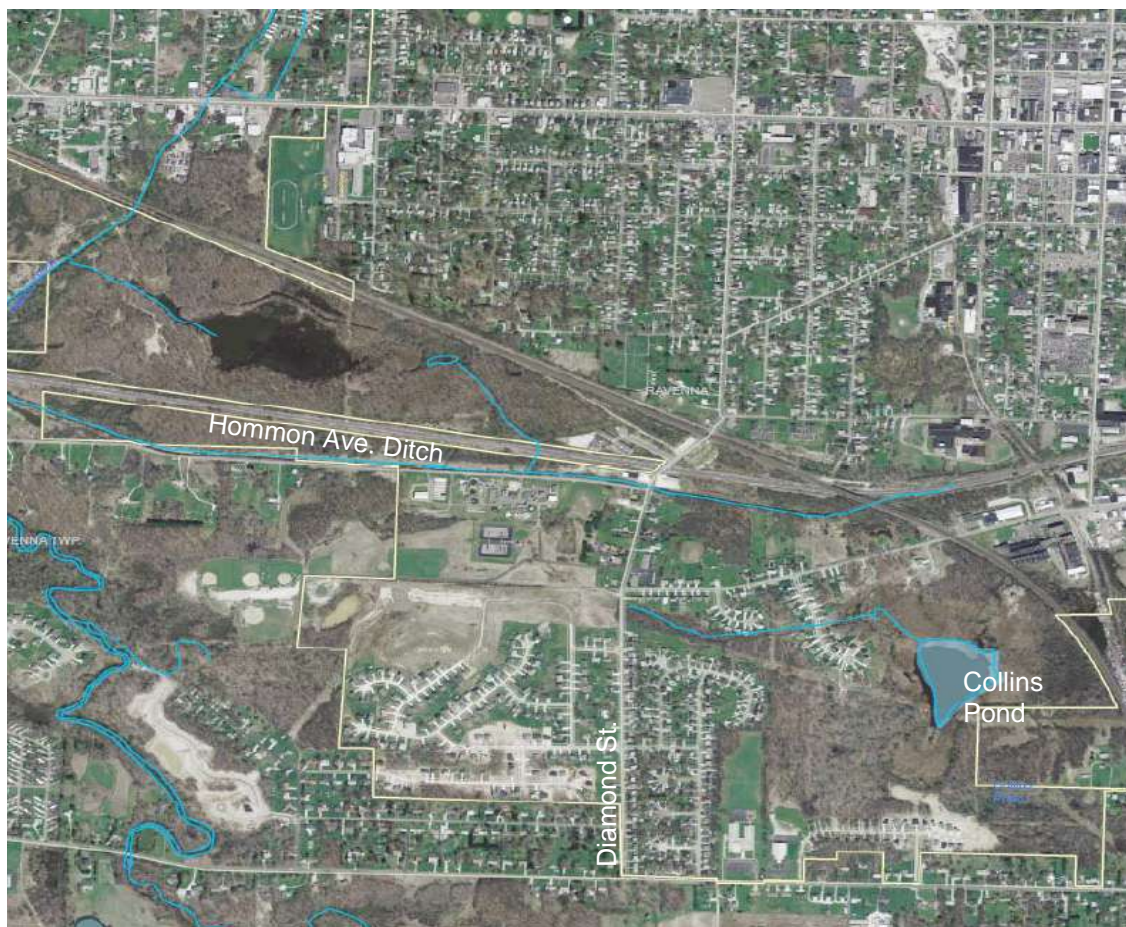


**B-151; 156; 157.** Hommon Ave. Ditch—(left) B-151—upstream of Ravenna Wastewater Treatment Plant; (lower left) B-156—downstream of wastewater treatment plant (WWTP in background right); and (below) B-157—where the bank and road appear to be eroding. Note high tension power lines in corridor, which would constrain channel reconstruction. May, 2011. Pics 25226, 30, 31





### Collins Pond and Hommon Ave. Ditch



Collins Pond (highlighted in blue in lower right). Neighbors have noted flooding problems. Collins Pond outlet is culverted west of Diamond St. (see previous page). The pond is surrounded by wetlands and “D” (very poorly draining) soils, see photos below. The pond is also largely surrounded by impervious surfaces, which increases the runoff load to the pond and outlet channel. Hommon Ave. Ditch is in a channel between a road, the wastewater treatment plant, and a high tension utility line. It appears that toward the downstream end of the ditch, the embankment is eroding, threatening the road. The pond in the left center of the picture has increased in size and wetness since the early 1900s. Possible measures to consider, in addition to the City’s riparian setback, include setting aside land through easements, reducing or storing runoff from impervious surfaces, daylighting the outlet and restoring some flood storage. Source: Ohio DNR, PCRPC, 2006 Photo.



**B-170** Ponding in poorly draining soils near Collins Pond, Fox Run Rd., Nov. 2009.



**B-180** View south and west showing wetland, Collins Pond, and houses. Nov., 2009.



## Feeder Canal



**B-670** Feeder Canal at Rootstown April, 2011



**B-670** (near) Tallmadge Rd. , April, 2011.



**B-660** Feeder Canal at Old Forge. Algae in April, nearby farms. April, 2011 . (Misnumbered as 550)



**B-650** Feeder Canal at Saxe Rd. Road ditch drains agricultural and large-lot residential land. April, 2011.





## Other Breakneck Creek & Feeder Canal Headwater Tributaries



**B-903** Breakneck headwater tributary at Lakewood Rd., July, 2010



**B-460** Breakneck headwater tributary at Lakewood Rd., south of I-76 April, 2011



**B-505.** Headwater tributary on Old Forge Rd. April, 2011.



**B-700, 710** Feeder Canal Headwater Tributaries Sandy Lake Road, May, 2011.





## Potter Creek—Lower



**Po-020** Potter Creek and substrate in wetland at Ranfield Rd. July, 2010.



**Po-030** Potter Creek at Randolph Rd. —in wetlands July, 2010.



**Po-040, 45** Potter Creek tributaries at Randolph Rd., July, 2010



**Po-050** Potter Cr. At Trares. Site of bio-assessment. Partially attaining WWH criteria. July, 2010



**Po-060** Potter Creek at Conley—embedded. Spring, 2005.



## Middle Potter Creek—Upstream of Conley Rd.

2012 Final



**Po-070** Potter Creek, site of potential over-wide ditch design to restore flood storage and a narrower, sinuous channel. Site received low QHEI score due to embeddedness, poor channel form, lack of sinuosity and cover. Dec., Oct., 2007.



**Po-072** Upstream of potential over-wide ditch location, the channel has substantially recovered and received a good QHEI score. Oct. 2007.



**Po-068** Wetland contiguous to and partially protected through easement. Oct. 2007.



**Po-100** Potter Creek at Waterloo Rd.. July, 2010.





## Potter Creek—Upper



**Po-110** Potter Creek at Shaffer. Exclusion fence has allowed creek to begin recovering. Blown out stream downstream from flood event. May, 2011.



**Po-120** Potter Creek at Steffy Rd. July, 2010.





## Congress Lake Outlet



**Po-010** Congress Lake Outlet/Potter Creek at Johnnycake Rd. during spring floods, April, 2011.



**Po-500** Congress Lake Outlet at Waterloo Rd. during spring floods, April, 2011



**Po-330** Congress Lake Outlet at Alexander Rd./confluence with Randolph Ditch (coming in from left). April, 2011



**Po-320** Congress Lake Outlet at Eberly Rd.. Embedded. July 2010



## Congress Lake Outlet—Upper



**Po-230** Congress Lake Outlet at Laubert Rd., July, 2010



**Po-210** Congress Lake Outlet at Gopp Rd..  
July, 2010



**Po-190** Congress Lake Outlet at Pinedale Rd.. Silted  
in. July, 2010



**Po-170** Congress Lake Outlet at Duquette Rd., July, 2010



**Po-160** Congress Lake Outlet at Swamp Rd..  
Weedy. July, 2010.



## Cranberry Creek



**Po-410** Cranberry Creek at Hartville Rd., Spring, 2011



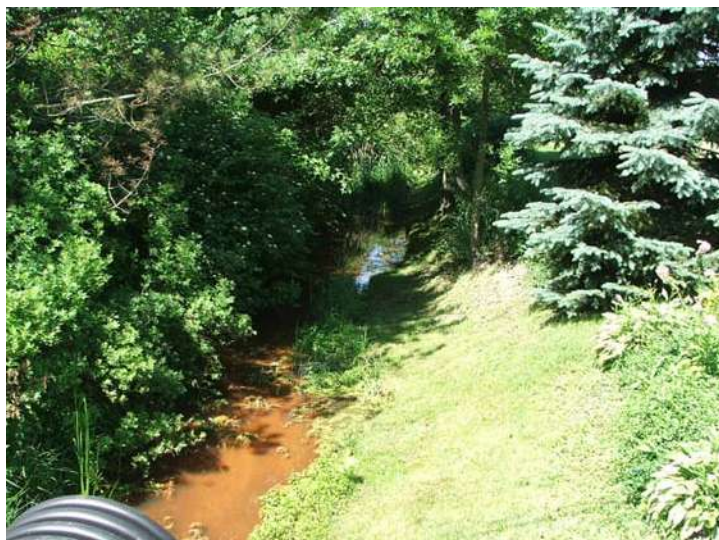
**Po-420** Cranberry Creek at Aberagg Rd., June, 2010.



**Po-430** Cranberry Creek at Shaffer Rd. (west) Spring, 2011



**Po-440** Cranberry Creek at Shaffer Rd. (east) Spring, 2011



**Po-450** Cranberry Creek at Griggy Rd. July, 2010



## Redinger Ditch



**Po-370** Redinger Ditch at Alexander Rd. Grassed buffer. Tile outlets apparent. Spring 2011.



**Po-380** Redinger Ditch at Hartville Rd. Grassed buffer. July, 2010.



**Po-390** Redinger Ditch at Alexander (w). Typical of tributaries, agricultural use with varying widths of grassed buffer. July, 2010.





## Randolph Ditch



**Po-310** Randolph Ditch at Route 44. Unrestricted livestock access. Downstream appears more intact. May, 2011.



**Po-265** Congress Lake Outlet tributary at Belding. Spring 2011.



**Po-290** Randolph Ditch tributary at Eberly (west), spring, 2011



**Po-300** Randolph Ditch tributary at Matti, Spring, 2011.



**Po-280** Randolph Ditch tributary at Eberly (eastern). Spring, 2011



## Congress Lake Outlet Tributaries

2012 Final



**Po-340, 341.** Congress Lake Outlet tributary at New Milford Rd. Spring, 2011. Pics. 24907, 908



**Po-265** Congress Lake Outlet tributary at Belding Rd.. Spring 2011.

**Po-250** Congress Lake Outlet tributary at A. Horning Rd., Unrestricted livestock access, incised. Spring, 2011.



**Po-180** Congress Lake Outlet tributary at Duquette. Channel is recovering. June, 2010.



**Po-240** Congress Lake Outlet Tributary Route 44 south of Laubert. This is typical of many tributaries, separated from agricultural uses with grass buffers of varying widths. July, 2010



Middle Cuyahoga River Watershed Action Plan  
Appendix  
TSD and TMDL data



Station	River Mile	Date	Comments	Temp (°C)	pH (s.u.)	D.O.	Cond. (umhos/cm)
BreakneckCk nr Homestead Rd	56.82/14.6	10-Jul-96		18.85	7.86	9.07	526
BreakneckCk nr Homestead Rd	56.82/14.6	20-Jun-96		22.69	7.76	6.44	403
BreakneckCk nr Homestead Rd	56.82/14.6	29-Aug-96		20.83	7.92	8.47	490
BreakneckCr nr Homestead Rd	56.82/14.6	30-Jul-96		19.63	7.85	6.71	684
Breakneck Cr @ Summit Rd	56.82/7.00	04-Sep-96		19.48	7.80	7.43	531
Breakneck Cr @ Summit Rd	56.82/7.00	10-Jul-96		19.63	7.80	7.54	545
Breakneck Cr @ Summit Rd	56.82/7.00	20-Jun-96		22.47	7.63	5.47	351
Breakneck Cr @ Summit Rd	56.82/7.00	29-Aug-96		20.48	7.69	7.19	469
Breakneck Cr @ Summit Rd	56.82/7.00	30-Jul-96		20.25	7.72	6.57	713
Breakneck Ck @ Lakewood Rd	56.82/5.19	04-Sep-96		19.81	7.83	7.04	539
Breakneck Ck @ Lakewood Rd	56.82/5.19	10-Jul-96		19.45	7.84	7.23	563
Breakneck Ck @ Lakewood Rd	56.82/5.19	20-Jun-96		22.25	7.65	5.30	348
Breakneck Ck @ Lakewood Rd	56.82/5.19	29-Aug-96		20.28	7.76	7.62	466
Breakneck Ck @ Lakewood Rd	56.82/5.19	30-Jul-96		20.51	7.76	5.86	727
Breakneck Ck @ Powder Mill	56.82/3.08	04-Sep-96		19.74	7.81	7.76	726
Breakneck Ck @ Powder Mill	56.82/3.08	10-Jul-96		19.18	7.80	8.07	712
Breakneck Ck @ Powder Mill	56.82/3.08	20-Jun-96		21.91	7.68	5.73	385
Breakneck Ck @ Powder Mill	56.82/3.08	29-Aug-96		19.56	7.79	7.71	590
Breakneck Ck @ Powder Mill	56.82/3.08	30-Jul-96		20.10	7.68	5.85	1044
Breakneck Crk @ SR 59	56.82/1.66	04-Sep-96		19.97	7.90	7.65	681
Breakneck Crk @ SR 59	56.82/1.66	10-Jul-96		19.29	7.84	7.46	736
Breakneck Crk @ SR 59	56.82/1.66	20-Jun-96		21.88	7.65	5.97	393
Breakneck Crk @ SR 59	56.82/1.66	29-Aug-96		21.97	7.69	6.33	545
Breakneck Crk @ SR 59	56.82/1.66	30-Jul-96		20.44	7.80	7.0	947
Breakneck Crk near mouth	56.82/0.28	04-Sep-96		19.76	7.92	8.14	649
Breakneck Crk near mouth	56.82/0.28	10-Jul-96		19.35	7.91	8.02	739
Breakneck Crk near mouth	56.82/0.28	20-Jun-96		21.84	7.67	6.05	390
Breakneck Crk near mouth	56.82/0.28	29-Aug-96		20.15	7.89	8.32	592
Breakneck Crk near mouth	56.82/0.28	30-Jul-96		20.42	7.93	8.32	552
Bridge Crk @ Stafford Rd	83.29/11.22	09-Jul-96		20.22	7.61	5.32	366
Bridge Crk @ Stafford Rd	83.29/11.22	16-Sep-96		13.69	7.31	6.04	514
Bridge Crk @ Stafford Rd	83.29/11.22	24-Jul-96		21.0	7.51	6.15	378
Bridge Crk @ Stafford Rd	83.29/11.22	27-Aug-96		21.1	7.86	10.20	390
Bridge Crk @ Stafford Rd	83.29/11.22	27-Jun-96		19.82	7.78	5.88	295



Station	River Mile	Date	Comments	Temp (°C)	pH (s.u.)	D.O.	Cond. (umhos/cm)
Cuy R @ Ravenna Rd	57.67	29-Aug-96		23.86	7.73	5.61	389
Cuy R @ Ravenna Rd	57.67	30-Jul-96		21.43	7.50	5.7	556
Cuy R @ Standing Rock	55.8	04-Sep-96		21.87	7.68	5.50	452
Cuy R @ Standing Rock	55.8	04-Sep-96	Dup. samp	21.87	7.68	5.50	452
Cuy R @ Standing Rock	55.8	10-Jul-96		19.62	7.75	6.55	585
Cuy R @ Standing Rock	55.8	20-Jun-96		21.85	7.62	5.66	384
Cuy R @ Standing Rock	55.8	29-Aug-96		21.64	7.75	6.00	460
Cuy R @ Standing Rock	55.8	30-Jul-96		20.75	7.57	6.07	287
Cuy R @ Fuller Park	54.32	04-Sep-96		22.61	7.95	9.01	453
Cuy R @ Fuller Park	54.32	10-Jul-96		20.92	7.89	8.92	602
Cuy R @ Fuller Park	54.32	20-Jun-96		22.05	7.81	8.37	383
Cuy R @ Fuller Park	54.32	29-Aug-96		21.80	7.93	8.40	286
Cuy R @ Fuller Park	54.32	30-Jul-96		21.12	7.81	8.21	715
Cuy R near Middlebury Rd	53.4	04-Sep-96		21.64	7.89	7.89	499
Cuy R near Middlebury Rd	53.4	10-Jul-96		20.82	7.90	8.51	631
Cuy R near Middlebury Rd	53.4	20-Jun-96		22.22	7.77	7.58	346
Cuy R near Middlebury Rd	53.4	29-Aug-96		21.73	7.82	7.22	494
Cuy R near Middlebury Rd	53.4	30-Jul-96		21.00	7.76	6.83	807
Cuy R @ Munroe Falls	50.0	04-Sep-96		23.00	7.91	7.96	595
Cuy R @ Munroe Falls	50.0	10-Jul-96		21.75	8.13	10.51	663
Cuy R @ Munroe Falls	50.0	20-Jun-96		22.33	7.67	6.92	355
Cuy R @ Munroe Falls	50.0	29-Aug-96		21.97	7.69	6.33	545
Cuy R @ Munroe Falls	50.0	30-Jul-96		22.35	7.99	9.19	942
Cuy R @ SR 91	49.78	04-Sep-96		22.77	8.13	9.70	554
Cuy R @ SR 91	49.78	10-Jul-96		22.17	8.24	9.64	333
Cuy R @ SR 91	49.78	20-Jun-96		22.31	7.83	8.48	355
Cuy R @ SR 91	49.78	29-Aug-96		22.15	7.91	8.66	549
Cuy R @ SR 91	49.78	30-Jul-96		22.22	8.07	8.46	819
Cuy R @ Waterworks Park	48.38	04-Sep-96		21.88	7.84	8.38	836
Cuy R @ Waterworks Park	48.38	10-Jul-96		19.86	7.84	10.15	806
Cuy R @ Waterworks Park	48.38	20-Jun-96		22.11	7.85	8.26	379
Cuy R @ Waterworks Park	48.38	29-Aug-96		21.13	7.69	7.64	623
Cuy R @ Waterworks Park	48.38	30-Jul-96		21.86	7.80	6.57	1352
Cuy R near Broad Blvd	46.25	04-Sep-96		22.17	8.21	9.24	766



Station	River Mile	Date	Comments	Temp (°C)	pH (s.u.)	D.O.	Cond. (umhos/cm)
Cuy R near Broad Blvd	46.25	10-Jul-96		21.76	8.36	7.20	826
Cuy R near Broad Blvd	46.25	20-Jun-96		22.41	8.14	8.96	354
Cuy R near Broad Blvd	46.25	29-Aug-96		22.15	8.17	8.82	638
Cuy R near Broad Blvd	46.25	30-Jul-96		22.53	8.31	8.34	1096
Cuy R dst Gorge Dam	43.8	04-Sep-96		22.86	8.56	9.39	721
Cuy R dst Gorge Dam	43.8	10-Jul-96		22.88	8.48	9.72	807
Cuy R dst Gorge Dam	43.8	10-Jul-96	Dup. samp	22.88	8.40	9.72	807
Cuy R dst Gorge Dam	43.8	20-Jun-96		22.79	8.18	8.60	352
Cuy R dst Gorge Dam	43.8	29-Aug-96		22.24	8.23	9.43	620
Cuy R dst Gorge Dam	43.8	30-Jul-96	Rain started	22.66	8.13	7.04	926
Cuy R dst Gorge Dam	43.8	30-Jul-96	Dup. samp	22.66	8.13	7.04	926
Cuy R @ Cuyahoga St	42.6	04-Sep-96		23.09	8.58	10.23	731
Cuy R @ Cuyahoga St	42.6	10-Jul-96		24.07	8.4	9.98	835
Cuy R @ Cuyahoga St	42.6	20-Jun-96		22.74	8.02	8.57	355
Cuy R @ Cuyahoga St	42.6	29-Aug-96		21.7	8.08	8.77	618
Cuy R @ Cuyahoga St	42.6	30-Jul-96	After rain	21.13	7.62	7.31	496
Cuy R @ Cuyahoga St	42.6	30-Jul-96	Rain	21.18	7.48	6.91	844
Potter Crk @ Trares Rd	56.82 /1.67/10.22	04-Sep-96		17.62	7.74	7.20	500
Potter Crk @ Trares Rd	10.22	10-Jul-96		16.53	7.84	8.49	498
Potter Crk @ Trares Rd	10.22	20-Jun-96		20.40	7.81	7.43	473
Potter Crk @ Trares Rd	10.22	29-Aug-96		18.38	7.76	7.46	518
Potter Crk @ Trares Rd	10.22	29-Aug-96	Dup. samp	18.38	7.75	7.43	518
Potter Crk @ Trares Rd	10.22	30-Jul-96		17.81	7.76	6.40	650
Wahoo Ditch @ Lakewood Rd	56.82/4.8 /0.39	04-Sep-96		19.58	7.40	3.94	1104
Wahoo Ditch @ Lakewood Rd	0.39	10-Jul-96		18.25	7.63	8.55	1220
Wahoo Ditch @ Lakewood Rd	0.39	20-Jun-96		20.37	7.88	10.84	998
Wahoo Ditch @ Lakewood Rd	0.39	29-Aug-96		20.33	7.69	8.76	1209
Wahoo Ditch @ Lakewood Rd	0.39	30-Jul-96		19.96	7.48	5.74	1516



Station	Hg		Zn		Hardness as CaCO <sub>3</sub>	COD	NO <sub>2</sub> -NO <sub>3</sub>
Cuy R @ US 422	0.2	K	10	K	116	15	0.17
Cuy R @ Standing Rock	0.2	K	10	K	177	10 K	0.87
Cuy R @ Standing Rock	0.2	K	11		179	10 K	0.83
Cuy R @ Standing Rock	0.2	K	14		246	18	1.16
Cuy R @ Standing Rock	0.2	K	13		163	30	0.62
Cuy R @ Standing Rock	0.2	K	10	K	177	20	0.86
Cuy R @ Standing Rock	0.2	K	12		217	10 K	1.90
Cuy R @ Fuller Park	0.2	K	10	K	174	12	0.73
Cuy R @ Fuller Park	0.2	K	11		243	38	1.50
Cuy R @ Fuller Park	0.2	K	27		160	27	0.74
Cuy R @ Fuller Park	0.2	K	10	K	179	22	0.73
Cuy R @ Fuller Park	0.2	K	10	K	220	15	1.29
Cuy R near Middlebury Rd	0.2	K	10	K	191	27	1.45
Cuy R near Middlebury Rd	0.2	K	10	K	241	10 K	2.13
Cuy R near Middlebury Rd	0.2	K	17		151	32	0.84
Cuy R near Middlebury Rd	0.2	K	10	K	177	20	1.22
Cuy R near Middlebury Rd	0.2		10	K	229	12	2.55
Cuy R @ Munroe Falls	0.2	K	10		200	22	2.17
Cuy R @ Munroe Falls	0.2	K	10	K	233	26	2.38
Cuy R @ Munroe Falls	0.2	K	24		142	30	0.62
Cuy R @ Munroe Falls	0.2	K	10	K	193	21	2.13
Cuy R @ Munroe Falls	0.2	K	11		241	22	3.28
Cuy R @ SR 91	0.2	K	10	K	202	24	2.16
Cuy R @ SR 91	0.2	K	10	K	238	18	2.62
Cuy R @ SR 91	0.2	K	10	K	142	24	0.71
Cuy R @ SR 91	0.2	K	12		193	31	2.14
Cuy R @ SR 91	0.2	K	10	K	236	10 K	3.52
Cuy R @ Waterworks Park	0.2	K	10	K	251	36	2.01
Cuy R @ Waterworks Park	0.2	K	10	K	269	15	1.74
Cuy R @ Waterworks Park	0.2	K	15		151	27	0.66
Cuy R @ Waterworks Park	0.2	K	10		212	20	2.08
Cuy R @ Waterworks Park	0.2	K	13		310	12	2.60
Cuy R near Broad Blvd	0.2	K	10	K	243	15	1.87
Cuy R near Broad Blvd	0.2	K	10	K	271	20	1.49
Cuy R near Broad Blvd	0.2	K	19		140	18	0.65
Cuy R near Broad Blvd	0.2	K	13		210	34	1.88
Cuy R near Broad Blvd	0.2	K	11		247	15	2.28



Station	Hg		Zn		Hardness as CaCO3	COD	NO2-NO3
Cuy R dst Gorge Dam	0.2	K	10		236	18	1.73
Cuy R dst Gorge Dam	0.2	K	10	K	250	26	1.85
<i>Cuy R dst Gorge Dam</i>	<i>0.2</i>	<i>K</i>	<i>10</i>	<i>K</i>	<i>250</i>	<i>23</i>	<i>1.86</i>
Cuy R dst Gorge Dam	0.2	K	20		139	27	0.59
Cuy R dst Gorge Dam	0.2	K	10	K	210	22	1.51
Cuy R dst Gorge Dam	0.2	K	10	K	222	28	1.23
<i>Cuy R dst Gorge Dam</i>	<i>0.2</i>	<i>K</i>	<i>10</i>		<i>217</i>	<i>18</i>	<i>1.24</i>
Cuy R @ Cuyahoga St	0.2	K	10		238	12	1.68
Cuy R @ Cuyahoga St	0.2	K	10	K	256	12	1.73
Cuy R @ Cuyahoga St	0.2	K	19		142	21	0.59
Cuy R @ Cuyahoga St	0.2	K	10	K	210	17	1.50
Cuy R @ Cuyahoga St	0.2	K	217		159	103	0.64
Cuy R @ Cuyahoga St	0.2	K	25		224	25	1.03



Station	Hg		Zn		Hardness as CaCO <sub>3</sub>	COD	NO <sub>2</sub> -NO <sub>3</sub>
Breakneck Cr @ Summit Rd	0.2	K	10	K	278	24	0.38
Breakneck Cr @ Summit Rd	0.2	K	10	K	280	12	0.54
Breakneck Cr @ Summit Rd	0.2	K	10	K	165	32	0.88
Breakneck Cr @ Summit Rd	0.2	K	10	K	227	25	0.39
Breakneck Cr @ Summit Rd	0.2	K	10	K	286	10 K	0.21
Breakneck Ck @ Lakewood Rd	0.2	K	10	K	276	21	0.43
Breakneck Ck @ Lakewood Rd	0.2	K	10		297	20	0.49
Breakneck Ck @ Lakewood Rd	0.2	K	10	K	163	38	0.78
Breakneck Ck @ Lakewood Rd	0.2	K	12		224	36	0.39
Breakneck Ck @ Lakewood Rd	0.2	K	10	K	277	10 K	0.22
Breakneck Ck @ Powder Mill	0.2	K	13		269	12	3.95
Breakneck Ck @ Powder Mill	0.2	K	19		288	20	1.99
Breakneck Ck @ Powder Mill	0.2	K	10	K	165	32	0.90
Breakneck Ck @ Powder Mill	0.2	K	13		233	34	2.11
Breakneck Ck @ Powder Mill	0.2	K	12		268	18	2.52
Breakneck Crk @ SR 59	0.2	K	10		264	21	3.89
Breakneck Crk @ SR 59	0.2	K	15		288	20	2.44
Breakneck Crk @ SR 59	0.2	K	10	K	165	35	0.82
Breakneck Crk @ SR 59	0.2	K	10		233	25	2.65
Breakneck Crk @ SR 59	0.2	K	12		266	10 K	4.51
Breakneck Crk near mouth	0.2	K	10	K	261	15	3.22
Breakneck Crk near mouth	0.2	K	10	K	285	18	2.14
Breakneck Crk near mouth	0.2	K	24		165	35	0.71
Breakneck Crk near mouth	0.2	K	28		229	25	2.32
Breakneck Crk near mouth	0.2	K	10	K	263	10 K	3.64
BreakneckCk nr Homestead Rd	0.2	K	11		292	28	0.39
BreakneckCk nr Homestead Rd	0.2	K	10	K	285	12	0.62
BreakneckCk nr Homestead Rd	0.2	K	13		203	38	1.05
BreakneckCk nr Homestead Rd	0.2	K	10	K	238	36	0.39
BreakneckCk nr Homestead Rd	0.2	K	12		292	18	0.20
Potter Crk @ Trares Rd	0.2	K	10	K	273	15	0.42
Potter Crk @ Trares Rd	0.2	K	10	K	274	10 K	0.57
Potter Crk @ Trares Rd	0.2	K	10	K	246	28	0.81
Potter Crk @ Trares Rd	0.2	K	10	K	260	20	0.48
Potter Crk @ Trares Rd	0.2	K	10	K	269	11	0.52
Potter Crk @ Trares Rd	0.2	K	10	K	283	10 K	0.51
Wahoo Ditch @ Lakewood Rd	0.2	K	25		262	15	9.07
Wahoo Ditch @ Lakewood Rd	0.2	K	41		269	32	4.81
Wahoo Ditch @ Lakewood Rd	0.2	K	23		246	32	4.06
Wahoo Ditch @ Lakewood Rd	0.2	K	22		257	28	11.5
Wahoo Ditch @ Lakewood Rd	0.2	K	25		255	26	4.72



Station	NH3-N	TKN	Total-P	TDS	TSS	FC Bacteria
Cuy R @ Standing Rock	0.08	0.5	0.05 K	310	5 K	33
Cuy R @ Standing Rock	0.05	0.5	0.05 K	306	5 K	33
Cuy R @ Standing Rock	0.06	0.5	0.07	404	6	230
Cuy R @ Standing Rock	0.14	0.8	0.12	272	14	180
Cuy R @ Standing Rock	0.05	0.4	0.07	324	5	40
Cuy R @ Standing Rock	0.07	0.6	0.11	390	7	220
Cuy R @ Fuller Park	0.05 K	0.4	0.08	300	5 K	30
Cuy R @ Fuller Park	0.05 K	0.4	0.09	396	7	180
Cuy R @ Fuller Park	0.12	0.8	0.10	272	8	280
Cuy R @ Fuller Park	0.05	0.4	0.09	328	5	150
Cuy R @ Fuller Park	0.05 K	0.5	0.10	384	5	440
Cuy R near Middlebury Rd	0.05 K	0.5	0.05 K	322	5 K	60
Cuy R near Middlebury Rd	0.05 K	0.4	0.11	420	6	140
Cuy R near Middlebury Rd	0.11	0.8	0.26	262	10	300
Cuy R near Middlebury Rd	0.08	0.4	0.10	328	7	370
Cuy R near Middlebury Rd	0.05	0.6	0.10	430	6	1000
Cuy R @ Munroe Falls	0.06	0.6	0.08	380	5 K	
Cuy R @ Munroe Falls	0.05 K	0.8	0.07	435	11	10
Cuy R @ Munroe Falls	0.15	0.9	0.12	242	12	250
Cuy R @ Munroe Falls	0.12	0.5	0.08	374	8	
Cuy R @ Munroe Falls	0.05 K	0.8	0.09	486	6	
Cuy R @ SR 91	0.05 K	0.5	0.11	384	7	30
Cuy R @ SR 91	0.05 K	0.6	0.08	434	11	40
Cuy R @ SR 91	0.13	0.8	0.10	242	11	340
Cuy R @ SR 91	0.14	0.4	0.08	376	9	10
Cuy R @ SR 91	0.05	0.7	0.10	486	6	40
Cuy R @ Waterworks Park	0.05 K	0.6	0.07	540	9	
Cuy R @ Waterworks Park	0.05 K	0.17	0.07	492	12	
Cuy R @ Waterworks Park	0.14	0.8	0.05	260	12	
Cuy R @ Waterworks Park	0.09	0.2	0.09	433	10	
Cuy R @ Waterworks Park	0.05 K	0.7	0.07	630	5	
Cuy R near Broad Blvd	0.05 K	0.8	0.06	494	10	100
Cuy R near Broad Blvd	0.05 K	0.7	0.05	530	13	60
Cuy R near Broad Blvd	0.11	0.6	0.05 K	252	14	260
Cuy R near Broad Blvd	0.08	0.2 K	0.10	428	14	90
Cuy R near Broad Blvd	0.08	0.9	0.07	534	9	120
Cuy R dst Gorge Dam	0.05 K	0.8	0.05	448	6	
Cuy R dst Gorge Dam	0.06	0.8	0.05 K	520	7	
Cuy R dst Gorge Dam	0.06	0.8	0.05 K	514	7	
Cuy R dst Gorge Dam	0.11	0.7	0.08	230	14	360
Cuy R dst Gorge Dam	0.05 K	0.2	0.06	420	6	
Cuy R dst Gorge Dam	0.13	0.7	0.06	456	5	
Cuy R dst Gorge Dam	0.12	0.7	0.06	466	5	



Station	NH3-N	TKN	Total-P	TDS	TSS	FC Bacteria
Cuy R dst Gorge Dam	0.06	0.8	0.05 K	520	7	
<i>Cuy R dst Gorge Dam</i>	<i>0.06</i>	<i>0.8</i>	<i>0.05 K</i>	<i>514</i>	<i>7</i>	
Cuy R dst Gorge Dam	0.11	0.7	0.08	230	14	360
Cuy R dst Gorge Dam	0.05 K	0.2	0.06	420	6	
Cuy R dst Gorge Dam	0.13	0.7	0.06	456	5	
<i>Cuy R dst Gorge Dam</i>	<i>0.12</i>	<i>0.7</i>	<i>0.06</i>	<i>466</i>	<i>5</i>	
Cuy R @ Cuyahoga St	0.05 K	0.7	0.05 K	456	5	280
Cuy R @ Cuyahoga St	0.05	0.7	.05 K	512	8	
Cuy R @ Cuyahoga St	0.11	0.7	0.06	248	19	360
Cuy R @ Cuyahoga St	0.05 K	0.2	0.07	420	9	90
Cuy R @ Cuyahoga St	0.79	1.6	0.68	254	342	200000
Cuy R @ Cuyahoga St	0.17	0.7	0.20	432	61	2100



Station	NH3-N	TKN	Total-P	TDS	TSS	FC Bacteria
Breakneck Cr @ Summit Rd	0.05 K	0.4	0.05	406	9	
Breakneck Cr @ Summit Rd	0.05 K	0.2 K	0.12	386	8	
Breakneck Cr @ Summit Rd	0.09	0.9	0.17	262	6	
Breakneck Cr @ Summit Rd	0.05 K	0.4	0.10	362	9	
Breakneck Cr @ Summit Rd	0.05 K	0.3	0.07	420	5 K	
Breakneck Ck @ Lakewood Rd	0.05 K	0.5		406	8	190
Breakneck Ck @ Lakewood Rd	0.05 K	0.2 K	0.23	406	15	
Breakneck Ck @ Lakewood Rd	0.09	0.9	0.14	264	7	
Breakneck Ck @ Lakewood Rd	0.05 K	0.5	0.08	360	14	14
Breakneck Ck @ Lakewood Rd	0.05 K	0.3	0.09	393	13	
Breakneck Ck @ Powder Mill	0.05 K	0.5	0.08	524	5 K	130
Breakneck Ck @ Powder Mill	0.15	0.5	0.07	498	6	
Breakneck Ck @ Powder Mill	0.16	1.0	0.11	280	14	
Breakneck Ck @ Powder Mill	0.05 K	0.6	0.10	434	5	130
Breakneck Ck @ Powder Mill	0.67	1.2	0.15	548	5 K	
Breakneck Crk @ SR 59	0.05 K	0.6	0.08	476	5 K	
Breakneck Crk @ SR 59	0.05 K	0.4	0.08	508	6	
Breakneck Crk @ SR 59	0.15	0.9	0.15	284	12	
Breakneck Crk @ SR 59	0.05 K	0.5	0.12	456	5 K	
Breakneck Crk @ SR 59	0.05 K	0.6	0.14	500	5 K	
Breakneck Crk near mouth	0.05 K	0.3	0.12	464	5 K	
Breakneck Crk near mouth	0.05 K	0.4	0.08	510	5 K	
Breakneck Crk near mouth	0.15	0.9	0.17	288	11	
Breakneck Crk near mouth	0.05 K	0.5	0.11	444	5	
Breakneck Crk near mouth	0.05 K	0.4	0.14	474	5 K	
BreakneckCk nr Homestead Rd	0.06	0.4	0.06	416	14	
BreakneckCk nr Homestead Rd	0.05	0.2	0.11	387	9	
BreakneckCk nr Homestead Rd	0.11	0.9	0.28	308	22	
BreakneckCk nr Homestead Rd	0.06	0.5	0.11	382	9	
BreakneckCk nr Homestead Rd	0.05 K	0.3	0.05	412	9	
Potter Crk @ Trares Rd	0.16	0.4	0.07	380	17	
Potter Crk @ Trares Rd	0.12		0.05 K	392	7	
Potter Crk @ Trares Rd	0.23	1.0	0.42	356	6	
Potter Crk @ Trares Rd	0.16	0.4	0.08	398	5	
Potter Crk @ Trares Rd	0.17	0.4	0.06	408	5 K	
Potter Crk @ Trares Rd	0.23	0.4	0.11	364	6	
Wahoo Ditch @ Lakewood Rd	0.19	0.9	0.12	790	5 K	140
Wahoo Ditch @ Lakewood Rd	1.42	2.5	0.26	864	5 K	15
Wahoo Ditch @ Lakewood Rd	0.48	1.9	0.66	724	5 K	
Wahoo Ditch @ Lakewood Rd	0.06	0.4	0.18	844	5 K	180
Wahoo Ditch @ Lakewood Rd	2.54	3.5	0.31	794	5 K	



Appendix Table . Qualitative Habitat Evaluation Index (QHEI) matrix showing modified and warmwater habitat characteristics for fish sampling sites in the Cuyahoga River basin study area, 1996.

			WWH Attributes										MWH Attributes																																																																																																																																																																																																																																																																																																																																																																																																																																							
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River Mile	QHEI	Gradient (ft/mile)	No Charrel Recovery	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr 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EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk	Fast Curr EutroCk



River Mile	QHEI	Habitat Rating	MWH Attributes																															
			WWH Attributes												MWH Attributes																			
															High Influence						Moderate Influence													
<div>Key QHEI Components</div>			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	Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse/ No Cover	Max. Depth <40 cm (WD, HW sites)	Total High Influence Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent & Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	Total Moderate Influence Attributes	(MWH H.I.+1)/ (WWH+1) Ratio	(MWH M.I.+1)/ (WWH+1) Ratio
Wahoo Ditch Year: 2009																																		
2.6	44.5	Fair											0			◆	◆	◆	3	●					●				●	●	●	5	4.00	9.00
2.5	46.0	Fair		■			■						2			◆	◆	◆	3	●	●				●				●	●	●	6	1.33	3.33
2.2	55.0	Good		■		■	■	■			■		5			◆			1	●	●				●				●	●	●	6	0.33	1.33

Source: Ohio EPA, 2009. Wahoo Ditch Bioassessment.



Appendix Table . IBI metric scores from fish sampling sites in the Cuyahoga River basin study area, 1996.

River Mile	Type	Date	Drainage area (sq mi)	Number of				Percent of Individuals					Rel.No. minus tolerants /(0.3km)	Modified Iwb			
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni- vores	Top carnivores			Insect- ivores	DELT anomalies	
Cuyahoga River - (190001)																	
Year: 1996																	
75.80	D	07/15/1996	151	14(3)	4(5)	2(1)	0(1)	2(1)	40(5)	35(3)	13(5)	15.7(5)	71(5)	0.0(5)	81(1) *	40	7.4
75.80	D	08/14/1996	151	15(3)	3(3)	3(3)	0(1)	3(3)	58(5)	25(3)	22(3)	14.0(5)	64(5)	2.4(1)	153(1)	36	7.8
64.50	D	07/15/1996	177	17(3)	3(3)	2(1)	1(1)	4(3)	51(5)	6(5)	4(5)	13.5(5)	78(5)	0.0(5)	156(1) *	42	7.6
64.50	D	08/14/1996	177	14(3)	1(1)	2(1)	1(1)	3(3)	41(5)	5(5)	3(5)	11.8(5)	83(5)	1.8(1)	158(1) *	36	7.3
57.50	D	07/15/1996	208	14(3)	5(5)	2(1)	0(1)	3(3)	38(5)	41(1)	1(5)	13.7(5)	82(5)	1.4(3)	65(1) *	38	6.8
57.50	D	08/14/1996	208	8(1)	3(3)	0(1)	0(1)	1(1)	20(3)	46(1)	0(5)	22.9(5)	71(5)	2.9(5)	29(1) *	32	4.4
56.00	D	07/16/1996	291	12(3)	5(5)	1(1)	0(1)	1(1)	16(1)	31(3)	7(5)	29.3(5)	55(5)	0.0(5)	60(1) *	36	6.9
56.00	D	08/14/1996	291	12(3)	4(5)	0(1)	0(1)	2(1)	7(1)	24(3)	0(5)	23.9(5)	57(5)	4.3(3)	53(1) *	34	6.5
44.00	E	08/27/1996	337	12(3)	0(1)	2(1)	0(1)	3(1)	48(5)	15(5)	11(5)	6.9(5)	54(3)	0.0(5)	222(3)	38	7.5
44.00	D	07/23/1996	337	14(3)	1(1)	2(1)	0(1)	2(1)	15(1)	4(5)	4(5)	1.2(3)	15(1)	0.0(5)	1484(5)	32	7.7
42.80	D	07/30/1996	340	15(3)	1(1)	2(1)	0(1)	4(3)	37(5)	4(5)	3(5)	0.3(1)	37(3)	0.0(5)	1682(5)	38	7.4
42.80	D	08/27/1996	340	13(3)	1(1)	2(1)	0(1)	4(3)	68(5)	7(5)	3(5)	0.5(1)	69(5)	0.0(5)	300(3)	38	6.3
54.20	A	07/16/1996	293	17(3)	5(5)	3(3)	1(1)	19(3)	57(5)	44(1)	43(1)	5(1)	34(3)	6.3(1)	136(1)	28	7.5
54.20	A	08/15/1996	293	15(3)	6(5)	3(3)	0(1)	13(1)	44(3)	42(1)	41(1)	11(5)	36(3)	8.2(1)	154(1)	28	7.6
53.40	A	07/16/1996	307	13(3)	5(5)	2(1)	0(1)	1(1)	6(1)	18(3)	14(5)	20(5)	46(3)	2.7(3)	184(1)	32	6.7
53.40	A	08/15/1996	307	13(3)	4(5)	2(1)	0(1)	1(1)	13(1)	26(3)	23(3)	13(5)	46(3)	2.4(3)	122(1) *	30	6.7
52.00	A	07/23/1996	309	14(3)	6(5)	1(1)	0(1)	0(1)	5(1)	16(3)	14(5)	36(5)	41(3)	4.5(1)	184(1)	30	7.3
52.00	A	08/15/1996	309	12(3)	5(5)	2(1)	0(1)	3(1)	7(1)	15(3)	14(5)	29(5)	45(3)	3.6(1)	188(1)	30	7.6
51.00	A	07/16/1996	322	10(3)	5(5)	1(1)	0(1)	0(1)	10(1)	24(3)	21(3)	15(5)	52(3)	11.9(1)	102(1) *	28	6.3
51.00	A	08/15/1996	322	8(1)	4(5)	1(1)	0(1)	0(1)	3(1)	11(5)	11(5)	16(5)	41(3)	2.9(3)	124(1) *	32	6.1
48.70	A	07/16/1996	327	14(3)	5(5)	2(1)	0(1)	4(1)	8(1)	34(1)	34(1)	15(5)	48(3)	7.0(1)	172(1)	24	7.1
48.70	A	08/15/1996	327	15(3)	5(5)	2(1)	0(1)	3(1)	13(1)	38(1)	36(1)	18(5)	46(3)	0.0(5)	110(1) *	28	7.1
48.00	A	08/15/1996	331	14(3)	5(5)	2(1)	0(1)	2(1)	11(1)	31(1)	31(1)	16(5)	48(3)	3.4(1)	122(1) *	24	6.9
48.00	A	07/23/1996	331	11(3)	4(5)	1(1)	0(1)	0(1)	14(1)	41(1)	40(1)	17(5)	40(3)	3.2(1)	112(1) *	24	6.4

▲ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample



# Breakneck Creek - (19028)

Year: 1996

3.10	D	08/01/1996	22	14(3)	3(3)	2(3)	0(1)	4(5)	29(3)	39(3)	14(5)	32.7(5)	51(3)	0.0(5)	45(1) *	40	5.4
3.10	D	10/09/1996	22	10(3)	2(3)	2(3)	0(1)	3(3)	18(3)	65(1)	1(5)	7.0(5)	90(5)	1.4(3)	38(1) *	36	4.7
1.70	D	08/01/1996	22	8(1)	2(3)	1(1)	0(1)	2(3)	31(1)	66(1)	28(1)	28.1(1)	44(1)	3.1(1)	17(1) **	16	5.0
1.70	D	10/09/1996	22	6(1)	2(3)	1(1)	0(1)	1(1)	13(1)	45(1)	0(1)	41.9(1)	58(1)	0.0(1)	26(1) **	14	4.3
0.20	D	08/02/1996	79	15(3)	2(3)	2(3)	2(1)	4(3)	36(3)	8(5)	3(5)	28.8(5)	62(5)	0.0(5)	101(1) *	42	7.4
0.20	D	10/09/1996	79	15(3)	2(3)	2(3)	1(1)	5(5)	61(5)	16(5)	9(5)	12.6(5)	78(5)	0.0(5)	110(1) *	46	6.9

# Bridge Creek - (19035)

Year: 1996

0.50	E	08/08/1996	37	11(3)	3(3)	1(1)	0(1)	2(1)	18(1)	45(3)	34(3)	3.6(3)	61(5)	0.0(5)	62(1) *	30	5.9
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# West Branch Cuyahoga - (19036)

Year: 1996

0.90	D	08/02/1996	35	17(3)	2(3)	3(3)	1(1)	5(5)	76(5)	7(5)	5(5)	9.4(5)	85(5)	0.0(5)	458(3)	48	7.0
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*Erie-Ontario Lake Plain - WWH Use Designation (Existing)*

530	13.41	67.5	NA	46	V. Good
86	6.38	66.5	NA	30*	Fair
171	5.74	86.5	NA	40	Good
90	5.05	56.5	<u>5.1*</u>	38	Poor/Good
47	5.85	59.5	<u>4.6*</u>	<u>15*</u>	Poor/V. Poor
120	4.00	69.0	7.2*	44	Fair/Good

*Erie-Ontario Lake Plain - WWH Use Designation (Existing)*

128	4.85	--	7.1*	44	Fair/Good
133	3.04	--	6.3*	40	Fair/Good
162	9.69	--	7.2*	42	Fair/Good

**Coregion Biocriteria: Erie-Ontario Lake Plain**

IBI			MIwb		
VWH	EWB	MWHc	VWH	EWB	MWHc
40	50	24	NA	NA	NA
38	50	24	7.9	9.4	5.6

headwater streams with drainage areas < 20 mi<sup>2</sup>.

from biocriteria (<4 IBI units or <0.5 MIwb units).

applicable biocriteria (>4 IBI units or >0.5 MIwb units). Underlined  
Very Poor range.



End of Volume