

Division of Surface Water

**Summary Report for the 2003
Wakatomika Creek Watershed
Biological and Water Quality
Survey**

**Coshocton, Knox, Licking, and Muskingum
Counties, Ohio**



November 1, 2007

Ted Strickland, Governor
Chris Korleski, Director

Summary Report for Wakatomika Creek Watershed Biological and Water Quality Survey (2003)

Coshocton, Knox, Licking, and Muskingum Counties, Ohio.

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prepared by

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SUMMARY REPORT

Biological and Water Quality Study of Wakatomika Creek and Selected Tributaries 2003

Coshocton, Knox, Licking and Muskingum Counties, OH

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INTRODUCTION

Ambient biological, water column chemical and sediment sampling was conducted in the Wakatomika Creek basin from June to October 2003 as part of the five-year basin approach for monitoring, assessment, and the issuance of National Pollution Discharge Elimination System (NPDES) permits and to facilitate a Total Maximum Daily Load (TMDL) assessment. This study area included the entire mainstem of Wakatomika Creek beginning in the headwaters (RM 44.9) and extending to the lowest site at RM 2.1, upstream from Dresden, Ohio. Where possible, tributary streams with at least 4 mi² of drainage were sampled.

Specific objectives of this evaluation were to:

- 1) Monitor and assess the chemical, physical and biological integrity of the streams within the 2004 Wakatomika Creek study area;
- 2) Characterize the consequences of various land uses on water quality within the Wakatomika Creek watershed (such as agriculture, development, or mining);
- 3) Evaluate the potential impacts from all known sources (WWTPs, industry, unsewered communities, spills, nonpoint source pollution (NPS), and habitat alterations on streams); and
- 4) Determine the attainment status of the currently designated Warmwater Habitat (WWH) and Exceptional Warmwater Habitat (EWH) aquatic life uses and other non-aquatic use designations (such as recreational use), recommend new use designations at previously unsampled streams or reaches, and change use designations (if needed) where appropriate.

The findings of this evaluation factor into regulatory actions taken by the Ohio EPA (*e.g.*, NPDES

permits, Director's Orders, the Ohio Water Quality Standards [OAC 3745-1], Water Quality Permit Support Documents [WQPSDs]) and are incorporated into State Water Quality Management Plans, the Ohio Nonpoint Source Assessment and the biennial Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]).

SUMMARY

Aquatic Life Use Attainment Status and Trends

The 2004 Wakatomika Creek study area included two Watershed Assessment Units: the upper Wakatomika Creek watershed (Hydrologic Unit Code # 05040004 020) and the lower Wakatomika Creek watershed (HUC # 05040004 030). The upper Wakatomika Creek watershed includes all tributaries and mainstem from the headwaters in Coshocton and Knox counties (origin south of Newcastle at > RM 46) to just downstream from the confluence with Brushy Fork ($\geq$ RM 19.68). This upper Wakatomika Creek watershed assessment area encompasses a drainage size of 118.1 square miles. The lower Wakatomika Creek watershed comprised the mainstem and all of the tributaries below Brushy Fork (< RM 19.68 to RM 0.0) downstream to the mouth where it joins the Muskingum River. The confluence with the Muskingum River is at RM 92.42. The lower Wakatomika Creek watershed assessment area is 116.1 mi², and the total drainage area for the Wakatomika Creek basin is 234.2 square miles. Summary statistics related to aquatic life use and a brief synopsis for each assessment unit are provided in Table 1A. The comments provided for each assessment unit include principal causes and sources of impact on aquatic life and recreational uses and significant contaminants in sediment and fish tissue.

Within the entire study area, aquatic life uses were assessed at 51 sites with 41 sites with drainage areas less than 50 mi². Approximately 30 percent were at subwatershed drainages less than 5 mi², forty percent were between 5 and 20 mi², and approximately fifteen percent were from 20 to 50 mi² drainage area (Table 1B). Of these sites, 30 fully met the designated or recommended uses. Nine sample sites partially met their water quality goals, and only two sites were not attaining. For larger stream sites between 50 mi² and 500 mi² of watershed, ten sites representing 27.81 miles of stream draining between 50 mi² and 231 mi² of watershed were sampled. The aquatic life use designation of Exceptional Warmwater Habitat was fully met for 21.11 miles - or 76 percent of the total assessed miles. Partial attainment was recorded for the other 6.70 miles. **The fish IBI and MIwb fully met the EWH biocriteria for the entire mainstem** - from > RM 45 to the mouth. Only two lower Wakatomika Creek mainstem sites did not meet the ecoregion EWH biological performance criteria due to stormwater-related sedimentation affecting the macroinvertebrate community quality. With this partial attainment in the lower mainstem from highway construction NPS runoff destabilization and sedimentation (along with some stormwater and residual mining effects upstream) the lower Wakatomika Creek HUC assessment score was only a 72.4. In contrast the upper Wakatomika Creek HUC score was 92. Most other issues in the watershed revolved around livestock access to the streams with riparian corridor losses and other negative ramifications (sedimentation, erosion, and excessive fecal bacterial concentrations present instream). Summary results and general causes and sources of impairments are illustrated in the attainment table and on the watershed water quality map to follow. For more detailed accounting of the remediation of the

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causes and sources of impairment see the Wakatomika Creek TMDL report
<http://www.epa.state.oh.us/dsw/tmdl/WakatomikaCreekTMDL.html>.

Table 1. Aquatic life use attainment status for sites sampled in the Wakatomika Creek basin from June- October, 2003. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and the Invertebrate Community Index (ICI) are scores based on the performance of the biotic community. The Qualitative Habitat Evaluation Index (QHEI) measures the ability of the physical habitat to support a biotic community. Aquatic life uses for the Wakatomika Creek basin were based on biological sampling conducted during June to October, 2003.

RIVER MILE Fish/Invert.	IBI	MIwb	ICI ^a	QHEI	Attainment Status ^b	Site Location
Wakatomika Creek (17-960) 2003 <i>Erie-Ontario Lake Plains</i> (EOLP) - Exceptional Warmwater Habitat (EWH) Use Designation (existing) & Coldwater Habitat (CWH) recommended						
45.0/44.9	50	NA	VG ^{ns}	60.0	FULL	at Coshocton Co. line Off Dennis Church Rd.
43.8	50	NA	E	82.5	FULL	Woods Church Rd.
41.2	54	NA	VG ^{ns}	83.0	FULL	Front Royal Rd.
Wakatomika Creek (17-960) 2003 (EOLP) - EWH (existing)						
37.7/37.8	46 ^{ns}	9.0 ^{ns}	54	75.0	FULL	SR 541 (ust. Bladensburg)
36.7	48 ^{ns}	9.6	52	77.0	FULL	Mill Rd. (dst. Bladensburg)
Wakatomika Creek (17-960) 2003 <i>Western Allegheny Plateau</i> (WAP) - EWH (existing)						
31.4	56	9.7	56	78.5	FULL	nr. covered bridge (Girl Scout Camp Rd)
29.8	55	9.8	E	93.5	FULL	Frampton Rd. covered bridge
24.7	57	9.8	VG ^{ns}	86.5	FULL	ust. SR 79 and ust. Winding Fork confluence
18.7	53	9.9	48	85.0	FULL	dst. Hamby Hill Rd.
14.9 RR	56	10.0	50	92.0	FULL	dst. Gage Station adj. Hamby Hill Rd.
12.2/12.5 RR	49 ^{ns}	8.9 ^{ns}	VG ^{ns}	73.0	FULL	Canal Rd (CR 8)
6.8/6.7	46 ^{ns}	8.9 ^{ns}	38*	61.0	PARTIAL	Schoolhouse Rd.
2.3/2.1 RR	56	11.0	38*	86.5	PARTIAL	ust. SR 60
Trib. to Wakatomika Cr. (@ RM 40.93) (17-959) 2003 (EOLP) - EWH & CWH (recommended)						
0.2	52	NA	E	78.5	FULL	ust. Van Winkle Rd.
Harrod Run (17-977) 2003 (EOLP) - EWH (recommended)						
2.2/2.3	52	NA	VG ^{ns}	60.5	FULL	ust. Bowman Rd.
1.0/0.9	54	NA	E	66.0	FULL	dst. Second tributary
0.2	48 ^{ns}	NA	E		FULL	near mouth
Jug Run (17-975) 2003 (WAP) - EWH & CWH (recommended)						
1.6	50	NA	VG ^{ns}	63.5	FULL	adj. Jug Run Rd. (dst. from trib.)
0.3/0.4	52	NA	E	73.5	FULL	near mouth
Trib. to Jug Run (@ RM 1.69) (17-955) 2003 (WAP) - EWH & CWH (recommended)						
0.5	52	NA	--	89.5	(FULL)	TR 182

RIVER	MILE	IBI	MIwb	ICI^a	QHEI	Attainment Status^b	Site Location
Fish/Invert.							
Winding Fork (17-973) 2003 (WAP) - EWH (existing)^d & CWH (recommended)							
4.2/4.1	44*	NA	E	56.5	PARTIAL	ust. SR 79	
Winding Fork (17-973) 2003 (WAP) - EWH (existing)^d							
3.1	42*	NA	E	54.5	PARTIAL	CR 383	
Brushy Fork (17-971) 2003 (WAP) - WWH (recommended^e)							
6.0	42	NA	VG	55.0	FULL	at Licking Valley Rd.	
4.2	36*	NA	28*	52.5	NON	dst. Dragoo Rd.	
Brushy Fork (17-971) 2003 (WAP) - EWH (existing - defined dst. RM 3.7^e)							
1.9	38*	8.3*	32*	56.0	NON	dst. Myrtle Rd.	
Priest Run (17-972) 2003 (WAP) - WWH & CWH (Recommended)							
0.4	42 ^{ns}	NA	VG	43.0	FULL	Licking Valley Rd.	
Trib. to Priest Run (@ RM 1.62) Pleasant Valley Run (17-909) 2003 (WAP) -WWH (recommended)							
0.1	38*	NA	VG	47.0	PARTIAL	at Licking Valley Rd.	
Nickel Valley Run (17-970) 2003 (WAP) - EWH (recommended)							
0.3	50	NA	VG ^{ns}	59.0	FULL	CR 25 (Pike Lane)	
Fivemile Run (17-969) 2003 (WAP) - WWH (recommended^f)							
5.2/5.1	26*	NA	F*	46.5	NON	adj. CR 80	
3.4	46	NA	G	65.5	FULL	gravel road off CR 80	
Fivemile Run (17-969) 2003 (WAP) - EWH (existing - defined dst. Twp. Rd. 4 - ≤ RM 2.1^f)							
0.3/0.8	40*	NA	50	79.0	PARTIAL	near mouth	
Black Run (17-968) 2003 (WAP) - WWH (existing)							
3.0/2.8	36*	NA	MG ^{ns}	38.0	PARTIAL	ust. SR 586	
0.3	42 ^{ns}	NA	MG ^{ns}	48.5	FULL	ust. Spencer Rd.	
Little Wakatomika Creek (17-961) 2003 (WAP) - WWH (confirmed) & CWH (recommended)							
9.6/9.5	44	NA	VG	49.0	FULL	SR 60	
Little Wakatomika Creek (17-961) 2003 (WAP) - WWH (confirmed)							
7.8	46	NA	E	53.0	FULL	CR 18	
6.8/6.7	48	NA	E	80.0	FULL	TR 68	
2.8/2.2	42 ^{ns}	7.9 ^{ns}	50	43.0	FULL	CR 426	
0.6/0.4	47	8.1 ^{ns}	38	61.0	FULL	ust. Raders Rd.	

RIVER MILE Fish/Invert.	IBI	MIwb	ICI ^a	QHEI	Attainment Status ^b	Site Location
Dickinson Run (17-966) 2003 (WAP) - WWH (confirmed)						
0.1	40 ^{ns}	NA	G	61.0	FULL	SR 60
Sand Fork (17-964) 2003 (WAP) - CWH (recommended)						
4.6	38	NA	MG	71.5	FULL	dst. CR 4 and dst. from trib.
Sand Fork (17-964) 2003 (WAP) - WWH (existing)						
1.3	40 ^{ns}	NA	G	50.0	FULL	CR 439
Mill Fork (17-962) 2003 (WAP) - WWH (recommended)						
7.1	30*	NA	G	63.0	PARTIAL	CR 286
6.3	30*	NA	MG ^{ns}	88.0	PARTIAL	dst. rd. across from Mill Fork Church
3.3	38*	NA	G	67.5	PARTIAL	CR 75
0.1/0.2	43 ^{ns}	8.2 ^{ns}	MG ^{ns}	47.0	FULL	ust. SR 60
Moscow Brook (17-963) 2003 (WAP) - WWH (existing) & CWH (recommended)						
2.6/2.5	38*	NA	MG ^{ns}	77.0	PARTIAL	TR 70 off CR 297
Moscow Brook (17-963) 2003 (WAP) - WWH (existing)						
0.3/0.1	36*	NA	MG ^{ns}	44.0	PARTIAL	dst. CR 6 near mouth

Biological Criteria for EOLP and WAP (EOLP/WAP)

Site Type INDEX	IBI Headwaters	IBI Wading	IBI Boat	MIwb Wading	MIwb Boat	ICI
EWB Habitat	≥50	≥50	≥48	≥9.4	≥9.6	≥46 (all sites)
WWH Habitat	≥40 / ≥44	≥38 / ≥44	≥40-43(both)	≥7.9-8.8/ ≥8.4-8.8	≥8.7-9.0/ ≥8.6-9.0	≥36-41
MWH Habitat	24	24	24	6.2	5.5	30
LRW Habitat	18	18	16	4.5-5.8	5.0-6.3	8

* Significant departure from ecoregion biocriterion; poor and very poor results are underlined.

ns Nonsignificant departure from biocriterion (<4 IBI or ICI units; <0.5 MIwb units).

a Narrative evaluation used in lieu of ICI (E=Exceptional; G=Good; MG=Marginally Good; F=Fair; P=Poor).

b Use attainment status based on one organism group is parenthetically expressed.

c Sampled or evaluated in 2000.

NA Not Applicable. The MIwb (Modified Index of Well-being) is not applicable to headwater sites.

d Partial attainment already dealt with in TMDL (unrestricted livestock access to the creek).
Improving the riparian corridor (non-TMDL function) would benefit both reaches.

e Brushy Fork was previously designated from one fish-only IBI site (=50) at RM 3.5 in 1994.
No sampling had occurred upstream. Non-attainment at downstream site already dealt with
in TMDL for Brushy Fork (unrestricted livestock access to the creek; riparian removal).

f Fivemile Run previously designated from one fish-only IBI site (=56) at RM 1.5 in 1994. No
sampling had occurred upstream. Partial attainment at downstream site already dealt with
in TMDL for Fivemile Run (unrestricted livestock access to the creek).

IMPLEMENTATION IDEAS FOR RESTORATION

- Fence out livestock from stream and riparian buffer
- Allow riparian buffers to grow around stream which
 - stabilizes the banks
 - decreases sedimentation
 - prevent algal growth (shade)
- ID/fix failed septic systems



Habitat and Flow



Habitat quality and flow is the key to healthy and diverse stream communities. Intact stream habitat like that shown in photo above (Winding Fork) helps to bind up nutrients, filter silt, slow & absorb water from storm runoff. Shading does help keep streams cool & inhibits instream algal growth. Good instream & riparian habitat provides more diverse niches & allows more variety of fish, mussels, and aquatic insects to reside. There is also a larger variety of amphibians, terrestrial wildlife, reptiles, and birds present. Baseline flow comes from cool, perennial groundwater, and these

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Wakatomika Creek
 Drainage area: 234 sq. mi.
 Length: 42 mi.
 Gradient: 9.3 ft./mi.
 Fish species: 65
 Macroinvertebrate taxa: 158



outlined conditions support sensitive fish like the coldwater (CW) Redside Dace that likes silt-free, rocky bottoms. (*Clinostomus elongatus*)



Wakatomika Cr

OERA (in 2003-2004) evaluated water quality in Wakatomika Creek watershed. Biological, chemical, and physical data were collected at the basin sites.

Overall, Wakatomika Creek is one of the top five quality Ohio streams based on its biological diversity, instream habitat and riparian quality, groundwater attributes, and stability. The results are shown in map below.



Wakatomika Cr. watershed is a high quality watershed but some fixable impacts to water quality in tributaries or mainstem include:

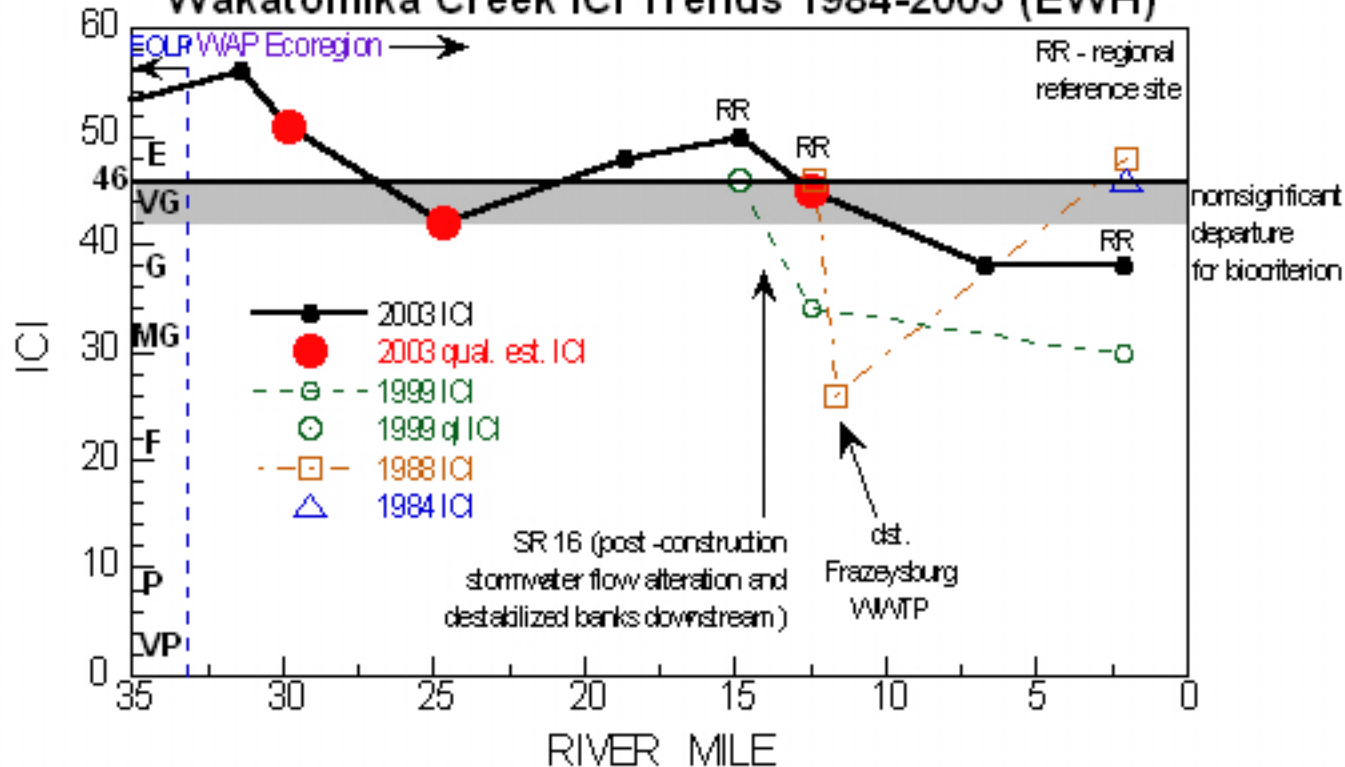
- 1) Bacteria from NPS runoff (cows/ag.)
- 2) Siltation (unrestricted cattle access)
- 3) Habitat alteration (riparian vegetat. removal by streams & cattle access)
- 4) NPS stormwater runoff / sediment via highway construction upstream
- 5) Nutrient enrichment (row crop agr.)



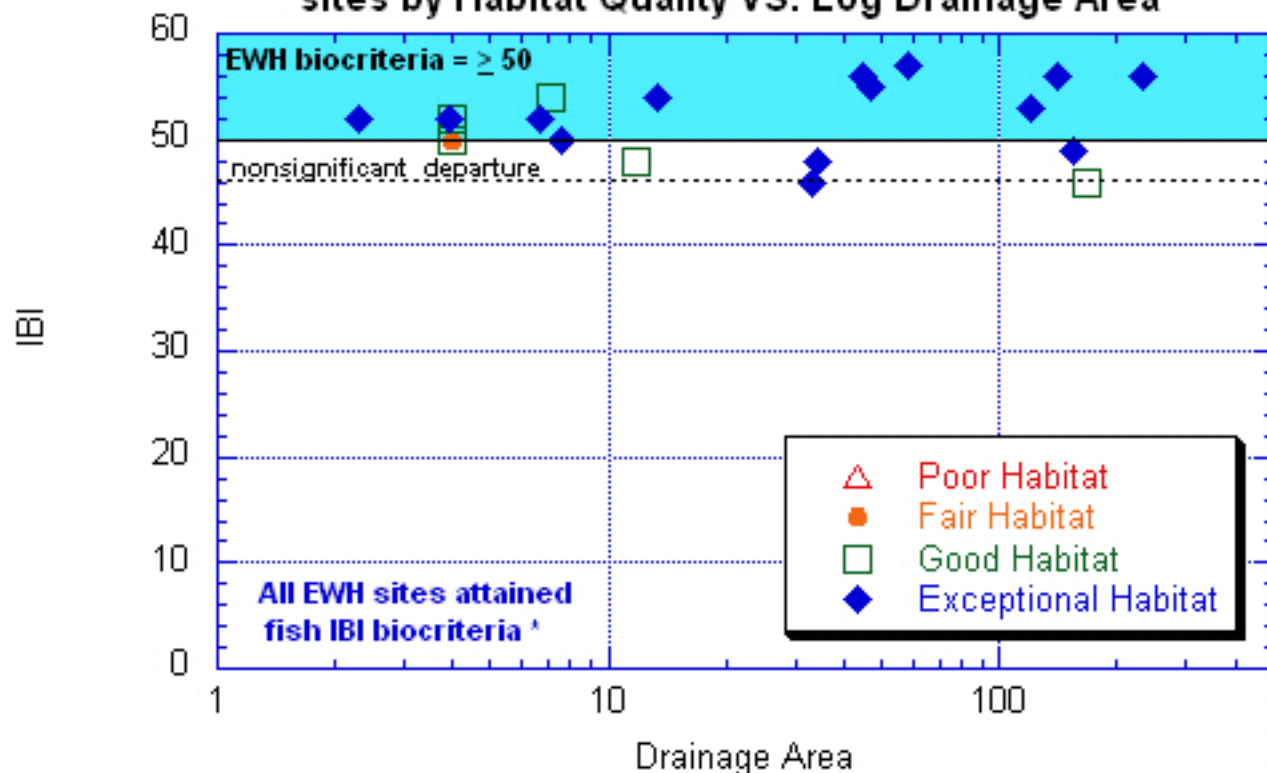
Ohio EPA uses a grading system to score biological integrity at various sites within a basin. The different types of species and fish densities, eating and breeding patterns, habitat, and the ability to survive in polluted conditions are some factors of biological integrity. Aquatic insects also reflect the health of the stream they reside in. Fish and macroinvertebrates in a healthy stream will have a diverse array of taxa. Based on taxa collected during samples, Ohio EPA is able to determine stream community health/quality.

Stream Health	
Blue line	Exceptional
Light blue line	Very Good
Green line	Good
Yellow line	Marginally Good
Orange line	Fair
Red line	Poor
Grey line	Not Sampled

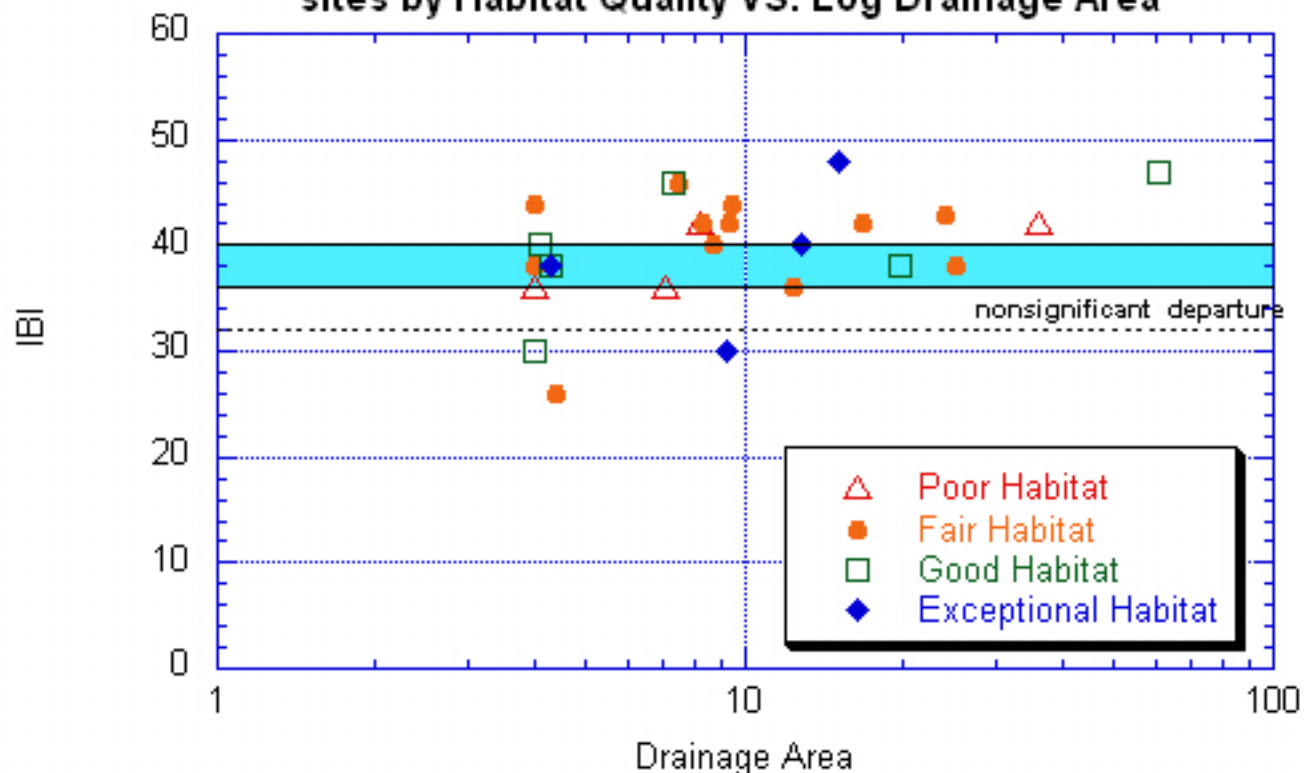
Wakatoma Creek ICI Trends 1984-2003 (EWH)



Wakatomika Creek 2003 IBI scores at EWH sites by Habitat Quality VS. Log Drainage Area



Wakatomika Creek 2003 IBI scores at WWH
sites by Habitat Quality VS. Log Drainage Area



Summary of Macroinvertebrate Data Collected from Artificial Substrates (Quantitative Sampling) and Natural Substrates (Qualitative sampling) in the Wakatomika Creek Study Area, July to October, 2003.

Stream RM	Drainage Area (sq. mi.)	Data Codes	Qual./ Total Taxa	# EPT Ql. / Total	Sensitive Taxa Ql. / Total	Qual. Tol. Taxa	Qual. Sens./ Tol.	Rel. Density Ql. /Qt.	QCTV	Predominant Organisms on Natural Substrates With Tolerance Category(ies) in Parentheses	ICI	Narrative Evaluation
Wakatomika Creek (17-960) (EOLP) - EWH (existing) and CWH (recommended)												
44.9	4.0	X19	64/ --	13 / --	19 / --	11	1.73	H-L / --	38.3	Hydropsychid caddisflies (F), <i>Rheotanytarsus</i> and <i>Polypedilum flavum</i> midges (MI,F), riffle beetles (F), baetid mayflies (F,I)	VG ^{ns}	Very Good
43.8	7.6	X19	55/ --	17 / --	24 / --	2	12.00	M / --	40.9	<i>Rheotanytarsus</i> midges (MI), <i>Helicopsyche</i> caddisflies (MI), stenonemid mayflies (F,MI)	E	Exceptional
41.2	13.4	X19	50/ --	15 / --	21 / --	1	21.0	M-L /--	41.8	<i>Elimia</i> snails (MI), water pennies (MI), <i>Stictochironomus</i> midges, <i>Neophlax</i> caddisflies (I)	VG ^{ns}	Exceptional
Wakatomika Creek (17-960) (EOLP) - EWH (existing)												
37.8	33	--	47/ 67	17 /18	15 / 25	8	1.88	M-H / 258	40.4	Water pennies (MI), <i>Elimia</i> snails (MI), <i>Petrophila</i> moths (I), <i>Neophylax</i> and <i>Hydroptila</i> caddisflies (I,F)	54	Exceptional
36.7	34	--	59/ 73	17 /20	27 / 35	5	5.40	H-L / 591	41.6	<i>Rheotanytarsus</i> midges (MI), <i>Neophylax</i> and <i>Hydroptila</i> caddisflies (I,F), stenonemid and <i>Tricorythodes</i> mayflies (MI)	52	Exceptional
Wakatomika Creek (17-960) (WAP) - EWH (existing)												
31.4	45	--	79/ 94	24 /29	35 / 47	7	5.00	H-M / 376	41.6	<i>Rheotanytarsus</i> midges (MI), <i>Neophylax</i> caddisflies (I), stenonemid mayflies (MI,F), <i>Elimia</i> snails (MI)	56	Exceptional
29.8	47	X12, X15	52/ 62	18 /18	25 / 27	5	5.00	M / 11	41.6	<i>Rheotanytarsus</i> midges (MI), <i>hydropsychid</i> caddisflies (F, MI), <i>Isonychia</i> and stenonemid mayflies (MI,F), fingernail clams (F)	E	Exceptional
24.7	58	X12	35/ --	21 /--	16 / --	0	≥16	H-L /--	43.5	<i>Rheotanytarsus</i> midges (MI), blackflies (F), stenonemid mayflies (MI,I)	VG ^{ns}	Very Good

Stream RM	Drainage Area (sq. mi.)	Data Codes	Qual./ Total Taxa	# EPT Ql. / Total	Sensitive Taxa Ql. / Total	Qual. Tol. Taxa	Qual. Sens./ Tol.	Rel. Density Ql. /Qt.	QCTV	Predominant Organisms on Natural Substrates With Tolerance Category(ies) in Parentheses	ICI	Narrative Evaluation
Wakatomika Creek (17-960) (WAP) - EWH (existing) (cont.)												
18.7	120	--	78/ 93	24 /29	39 / 49	9	4.33	M-H / 1277	41.2	<i>Elimia</i> snails (MI), fingernail clams (F,MI), <i>Neophylax</i> caddisflies (I), <i>Rheotanytarsus</i> midges (MI), <i>Isonychia</i> mayflies (MI)	48	Exceptional
14.9	140	--	70/ 91	26 /32	41 / 56	4	10.25	M-H / 532	42.3	<i>Rheotanytarsus</i> midges (MI), <i>Elimia</i> snails (MI), <i>Petrophila</i> moths (I), <i>Neophylax</i> caddisflies (I)	50	Exceptional
12.5	154	X12	45/ 62	16 /18	29 / 39	3	9.67	M-L/34	42.8	<i>Rheotanytarsus</i> midges (MI), hydropsychid caddisflies (F), <i>Elimia</i> snails (MI), water pennies (MI), mayflies (F,MI,I)	VG ^{ns}	Very Good
6.7	166	--	64/ 34	15 /17	15 / 26	4	3.75	M / 212	41.9	Baetid mayflies (F,MI,I), Polycentropid caddisflies (MI), <i>Macronychus glabrescens</i> beetles (MI), stenonemid mayflies (F, MI,I)	38*	Good
2.1	231	--	50/ 83	16 /21	21 / 38	8	2.63	H-L / 174	42.1	<i>Elimia</i> snails (MI), stenonemid mayflies (F, MI,I), <i>Corbicula fluminea</i> (MI)	38*	Good
Trib. To Wakatomika Creek (17-959) (@ RM 40.93) (EOLP) - EWH and CWH (recommended)												
0.2	3.9	X19	58/ --	15 /--	25 / --	2	12.50	H-M/--	41.0	Hydropsychid caddisflies (F, MI), <i>Rheotanytarsus</i> and <i>Stictochironomus</i> midges (MI,F), stenonemid mayflies (F,MI)	E	Exceptional
Harrod Run (17-977) (EOLP) - EWH (recommended)												
2.3	4.0	X19	47/ --	10 /--	15 / --	5	3.00	M-L/--	39.4	<i>Rheotanytarsus</i> midges (MI), <i>Neophylax</i> and Hydropsychid caddisflies (I,F)	VG ^{ns}	Very Good
0.9	7.1	X19	68/ --	17 /--	30 / --	3	10.00	M-H/--	41.8	Riffle beetles (F,MI), <i>Rheotanytarsus</i> midges (MI), Hydropsychid caddisflies (F), <i>Helicopsyche</i> caddisflies (MI)	E	Exceptional
0.2	11.8	--	77/ --	21 /--	27 / --	9	3.00	H-M/--	39.5	Hydropsychid caddisflies (F,MI), <i>Rheotanytarsus</i> midges (MI), <i>Neophylax</i> (I)	E	Exceptional

Stream RM	Drainage Area (sq. mi.)	Data Codes	Qual./ Total Taxa	# EPT Ql. / Total	Sensitive Taxa Ql. / Total	Qual. Tol. Taxa	Qual. Sens./ Tol.	Rel. Density Ql. /Qt.	QCTV	Predominant Organisms on Natural Substrates With Tolerance Category(ies) in Parentheses	ICI	Narrative Evaluation
Jug Run (17-975) (WAP) - EWH (existing) and CWH (recommended)												
1.6	5.0	X19	53/ --	10 /--	25 / --	4	6.25	H-M/--	40.0	Hydropsychid caddisflies (F,MI), <i>Rheotanytarsus</i> midges (MI), other midges (F,MI,CW)	VG ^{ns}	Very Good
0.4	6.7	X19	66/ --	15 /--	29 / --	6	4.83	M-H/--	40.0	Hydropsychid caddisflies (MI,F), <i>Rheotanytarsus</i> midges (MI), <i>Optioservus</i> , <i>Helichus</i> , and <i>Dubiraphia</i> riffle beetles (MI,F), burrowing mayflies (MI)	E	Exceptional
Winding Fork (17-973) (WAP) - EWH (existing) and CWH (recommended)												
4.1	9.5	X19	61/ --	17 /--	28 / --	7	4.00	H-M/--	41.0	Hydropsychid caddisflies (F,MI), <i>Rheotanytarsus</i> midges (MI), <i>Elimia</i> snails (MI), crayfish (F)	E	Exceptional
Winding Fork (17-973) (WAP) - EWH (existing)												
3.1	16.8	--	61/ --	20 /--	25 / --	5	5.00	H-M/--	41.0	Hydropsychid caddisflies (F), <i>Rheotanytarsus</i> midges (MI), <i>Chimarra</i> and <i>Neophylax</i> caddisflies (MI,I), <i>Elimia</i> snails (MI), <i>Stenonema vicarium</i> (MI)	E	Exceptional
Brushy Fork (17-971) (WAP) - WWH (recommended)												
6.0	8.3	X19	61/ --	14 /--	24 / --	5	4.80	M-L/--	40.4	<i>Rheotanytarsus</i> midges (MI), <i>Elimia</i> snails (MI), Baetid mayflies (F), <i>Chimarra</i> caddisflies (MI)	VG	Very Good
4.2	12.3	--	41/ 60	8 / 8	10 / 17	7	1.43	H-M/ 83	38.1	Hydropsychid and hydroptilid caddisflies (F), <i>Tanytarsini</i> and other midges (F,MI,MT), aquatic worms (MT)	28*	Fair*
Brushy Fork (17-971) (WAP) - EWH (existing)												
1.9	25	--	43/ 67	7 / 8	10 / 19	8	1.25	M/ 209	37.5	Hydropsychid caddisflies (F), <i>Tanytarsini</i> midges (MI) and other midges (F,MI), aquatic worms (MT), limpet snails (F)	32*	Marginally Good*
Priest Run (17-972) (WAP) - WWH (recommended) and CWH (recommended)												
0.4	8.2	X19	42/ --	11 /--	18 / --	3	6.00	M /--	42.1	Hydropsychid caddisflies (F), <i>Elimia</i> snails (MI), Stenonemid mayflies (F)	VG	Very Good

Stream RM	Drainage Area (sq. mi.)	Data Codes	Qual./ Total Taxa	# EPT Ql. / Total	Sensitive Taxa Ql. / Total	Qual. Tol. Taxa	Qual. Sens./ Tol.	Rel. Density Ql. /Qt.	QCTV	Predominant Organisms on Natural Substrates With Tolerance Category(ies) in Parentheses	ICI	Narrative Evaluation
Trib. to Priest Run (@ RM 1.62) Pleasant Valley Run (17-909) (WAP) - WWH (recommended)												
0.1	4.0	X19	61/ --	16 /--	15 / --	11	1.36	M-L/--	38.3	<i>Glossosoma</i> caddisflies (MI), midges (F,MI)	VG	Very Good
Nickel Valley Run (17-970) (WAP) - EWH (recommended)												
0.3	4.0	X19	38/ --	11 /--	17 / --	2	8.50	M / --	41.6	Hydropsychid caddisflies (F), riffle beetles (MI,F), stenonemid mayflies (MI,F), <i>Pycnopsyche</i> caddisflies (MI), <i>Elimia</i> snails (MI)	VG ^{ns}	Very Good
Fivemile Run (17-969) (WAP) - WWH (recommended)												
5.1	4.4	X19	28/ --	1 / --	11 / --	2	5.50	M-H/--	36.8	<i>Tanytarsini</i> & other midges (MI,F,T), flatworms (F)	F*	Fair*
3.4	7.3	X19	40/ --	9 / --	7 / --	7	1.00	H-M/--	39.3	Riffle beetles (F), <i>Rheotanytarsus</i> midges (MI), fingernail clams (F), crayfish (F), <i>Elimia</i> snails (MI)	G	Good
Fivemile Run (17-969) (WAP) - EWH (existing)												
0.5	12.8	--	51/ 64	14 /16	23 / 29	1	23.00	H-L/ 341	41.9	<i>Rheotanytarsus</i> midges (MI), stenonemid mayflies (F,MI), hydropsychid caddisflies (F), <i>Elimia</i> snails (MI)	50	Exceptional
Black Run (17-968) (WAP) - WWH (existing)												
2.8	4.0	X19	44/ --	6 / --	7 / --	16	0.44	H-L/ --	30.4	Hydropsychid caddisflies (F), corixids (F), <i>Rheotanytarsus</i> midges (MI), fingernail clams (F)	MG ^{ns}	Marginally Good
0.3	9.3	X19	68/ --	7 / --	17 / --	14	1.21	M-L/--	35.0	Hydropsychid caddisflies (F), <i>Rheotanytarsus</i> & other midges (F,MI), riffle beetles (F), fingernail clams (F)	MG ^{ns}	Marginally Good
Little Wakatomika Creek (17-961) (WAP) - WWH (confirmed) and CWH (recommended)												
9.5	4.0	X19	64/ --	15 /--	24 / --	8	3.00	H-L/--	39.5	Hydropsychid caddisflies (F, MI), <i>Rheotanytarsus</i> (MI), <i>Polypedilum</i> , and <i>Stictochironomus</i> midges (MI,F), and Stenonemid mayflies (F), crayfish (F)	VG ^{ns}	Very Good

Stream RM	Drainage Area (sq. mi.)	Data Codes	Qual./ Total Taxa	# EPT QL. / Total	Sensitive Taxa QL. / Total	Qual. Tol. Taxa	Qual. Sens./ Tol.	Rel. Density QL. /Qt.	QCTV	Predominant Organisms on Natural Substrates With Tolerance Category(ies) in Parentheses	ICI	Narrative Evaluation
Little Wakatomika Creek (17-961) (WAP) - WWH (confirmed)												
7.8	7.5	X19	68/ --	19 /--	23 / --	5	4.60	H-M/--	41.9	Hydropsychid caddisflies (F, MI), <i>Rheotanytarsus</i> and <i>Stictochironomus</i> midges (MI,F), stenonemid mayflies (F,MI)	E	Exceptional
6.7	15.1	--	72/ --	18 /--	27 / --	5	5.40	H-L/--	39.7	<i>Rheotanytarsus</i> midges (MI), stenonemid mayflies (F,MI)	E	Exceptional
2.2	36	--	46/ 77	11 /18	17 / 34	4	4.25	L / 345	40.0	Hydropsychid caddisflies (F), midges (MI)	50	Exceptional
0.4	61	--	37/ 69	9 /12	9 / 24	5	1.80	L/ 182	40.4	Riffle beetles (MI,F), crayfish (F), hydropsychid caddisflies (F), scuds (F), <i>Tanytarsini</i> midges (MI)	38	Good
Dickinson Run (17-966) (WAP) - WWH (confirmed)												
0.1	4.1	X19	46/ --	12 / --	17 / --	4	4.25	M-L/--	41.6	<i>Rheotanytarsus</i> midges (MI), stenonemid mayflies (F), hydropsychid caddisflies (F), riffle beetles (F)	G	Good
Sand Fork (17-964) (WAP) - WWH (confirmed) and CWH (recommended for upper reach)												
4.6	4.3	X19	35/ --	7 / --	9 / --	4	2.25	M-L/--	39.4	Hydropsychid caddisflies (F), <i>Rheotanytarsus</i> midges (MI), <i>Rheotanytarsus</i> and other midges (MI,F,T)	MG ^{ns}	Marginally Good
1.3	8.7	X19	39/ --	7 / --	16 / --	4	4.00	M-L/--	40.0	Hydropsychid caddisflies (F,MI), fingernail clams (F), crayfish (F)	G	Good
Mill Fork (17-962) (WAP) - WWH (recommended)												
7.1	4.0	X19	42/ --	9 / --	15 / --	6	2.50	M-L/--	39.4	Hydropsychid caddisflies (F,MI), <i>Rheotanytarsus</i> midges (MI)	G	Good
6.3	9.2	X19	33/ --	6 / --	12 / --	4	3.00	L / --	39.7	Hydropsychid caddisflies (F,MI), riffle beetles (F), crayfish (F)	MG ^{ns}	Marginally Good
3.3	19.7	--	35/ --	11/ --	13 / --	5	2.60	H-L /--	41.6	Hydropsychid caddisflies (F,MI), riffle beetles (F), crayfish (F)	G	Good
0.2	24	X12	21/ 55	2 / 6	3 / 21	2	1.50	L / 179	40.0	Hydropsychid caddisflies (F), riffle beetles (F,MI)	(30)/ MG ^{ns}	Marginally Good

Stream RM	Drainage Area (sq. mi.)	Data Codes	Qual./ Total Taxa	# EPT Ql. / Total	Sensitive Taxa Ql. / Total	Qual. Tol. Taxa	Qual. Sens./ Tol.	Rel. Density Ql. /Qt.	QCTV	Predominant Organisms on Natural Substrates With Tolerance Category(ies) in Parentheses	ICI	Narrative Evaluation
Moscow Brook (17-963) (WAP) - WWH (existing) and CWH (recommended)												
2.5	4.3	X19	37/ --	7 / --	14 / --	4	3.50	M-L/--	41.6	Hydropsychid caddisflies (F,MI,CW), riffle beetles (F,MI)	MG ^{ns}	Marginally Good
Moscow Brook (17-963) (WAP) - WWH (existing)												
0.1	7.1	X19	32/ --	7 / --	9 / --	4	2.25	H-M/--	40.0	Hydropsychid and hydroptilid caddisflies (MI,F)	MG ^{ns}	Marginally Good

RM: River Mile.

Data Codes: X: 8=Non-Detectable Current, 11=Lake Erie Influence (Lacustrary), 12=Suspected High Water Influence/Disturbance, 13=Suspected Disturbance By Vandalism, 15=Current >0.0 fps but <0.3 fps, 19=Drainage Area<10 mi², 29=Primary Headwater Habitat Stream.

Ql.: Qualitative sample collected from the natural substrates.

Sensitive Taxa: Taxa listed on the Ohio EPA Macroinvertebrate Taxa List as MI (moderately intolerant) or I (intolerant).

Qt.: Quantitative sample collected on Hester-Dendy artificial substrates, density is expressed in organisms per square foot.

Qualitative sample relative density: L=Low, M=Moderate, H=High.

Tolerance Categories: VT=Very Tolerant, T=Tolerant, MT=Moderately Tolerant, F=Facultative, MI=Moderately Intolerant, I=Intolerant

ns : nonsignificant departure from attainment criteria of designated aquatic life use (four units)

* nonattainment of aquatic life use

				Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)		IBI
River Mile	Type	Date	Drainage area (sq mi)	Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies			
<i>Priest Run trib 1.62 - (17-909)</i>																	
Year: 2003																	
0.10	E	08/08/2003	4.0	16(5)	9(5)	4(5)	0(1)	2(3)	5(5)	77(1)	27(1)	70(1)	26(3)	0.0(5)	238(3)	38	
<i>Jug Run trib 1.69 - (17-955)</i>																	
Year: 2003																	
0.50	E	08/20/2003	2.3	14(5)	7(5)	7(5)	3(5)	4(5)	5(5)	53(3)	8(5)	40(3)	23(3)	0.0(5)	1305(5)	54	
<i>Wakatomika C tr 40.9 - (17-959)</i>																	
Year: 2003																	
0.20	E	07/29/2003	3.9	20(5)	10(5)	4(5)	2(3)	3(5)	7(5)	50(3)	17(3)	54(3)	43(5)	0.0(5)	735(5)	52	
<i>Wakatomika Creek - (17-960)</i>																	
Year: 2003																	
45.00	E	07/29/2003	4.0	22(5)	9(5)	4(5)	4(5)	4(5)	7(5)	48(3)	37(1)	63(1)	43(5)	0.0(5)	2645(5)	50	
43.80	E	07/30/2003	7.6	23(5)	11(5)	5(5)	7(5)	5(5)	10(5)	57(1)	26(3)	49(3)	26(3)	0.1(5)	835(5)	50	
41.20	E	07/30/2003	13.4	27(5)	11(5)	5(5)	8(5)	6(5)	10(5)	40(3)	28(3)	40(3)	48(5)	0.1(5)	1230(5)	54	
<i>L. Wakatomika Creek - (17-961)</i>																	
Year: 2003																	
9.60	E	08/06/2003	4.0	10(3)	4(3)	1(1)	2(3)	4(5)	2(1)	26(5)	6(5)	31(3)	45(5)	0.1(5)	1743(5)	44	
7.80	E	08/06/2003	7.5	19(5)	7(5)	3(3)	4(3)	5(5)	6(5)	56(3)	14(5)	61(1)	39(3)	0.3(5)	345(3)	46	
6.80	E	08/06/2003	15.1	23(5)	6(3)	2(3)	7(5)	6(5)	9(5)	46(3)	23(3)	36(3)	52(5)	0.0(5)	280(3)	48	
<i>Mill Fork - (17-962)</i>																	
Year: 2003																	
7.10	E	08/07/2003	4.0	8(3)	4(3)	1(1)	1(1)	1(1)	4(3)	75(1)	4(5)	81(1)	23(3)	0.0(5)	235(3)	30	
6.30	E	08/15/2003	9.2	10(3)	5(3)	3(3)	1(1)	2(3)	4(3)	72(1)	1(5)	69(1)	20(1)	0.0(5)	195(1)	30	
3.30	E	08/07/2003	19.7	16(3)	7(5)	2(3)	3(1)	4(3)	6(3)	55(1)	13(5)	54(3)	47(3)	0.0(5)	325(3)	38	
<i>Moscow Brook - (17-963)</i>																	
Year: 2003																	
2.60	E	08/07/2003	4.3	14(5)	6(5)	3(3)	1(1)	2(3)	5(5)	78(1)	6(5)	72(1)	21(3)	0.0(5)	105(1)	38	
0.10	E	08/07/2003	7.1	13(3)	6(5)	2(3)	2(1)	3(3)	4(3)	72(1)	1(5)	56(1)	21(3)	0.0(5)	270(3)	36	

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni- vores	Pioneering fishes	Insect- ivores	DELT anomalies			
<i>Sand Fork - (17-964)</i>																	
Year: 2003																	
4.60	E	08/06/2003	4.3	11(3)	6(5)	2(3)	0(1)	2(3)	3(3)	65(1)	11(5)	51(3)	32(3)	0.0(5)	173(3)	38	
1.30	E	08/15/2003	8.7	14(5)	8(5)	3(3)	1(1)	3(3)	5(3)	59(1)	11(5)	38(3)	38(3)	0.0(5)	233(3)	40	
<i>Dickinson Run - (17-966)</i>																	
Year: 2003																	
0.10	E	08/06/2003	4.1	14(5)	8(5)	3(3)	2(3)	2(3)	7(5)	78(1)	4(5)	72(1)	10(1)	0.0(5)	200(3)	40	
<i>Black Run - (17-968)</i>																	
Year: 2003																	
3.00	E	08/05/2003	4.0	14(5)	7(5)	0(1)	2(3)	1(1)	2(1)	68(1)	13(5)	63(1)	42(5)	0.0(5)	153(3)	36	
0.30	E	08/18/2003	9.3	22(5)	9(5)	1(1)	4(3)	3(3)	5(3)	56(3)	27(3)	49(3)	45(5)	0.0(5)	468(3)	42	
<i>Fivemile Run - (17-969)</i>																	
Year: 2003																	
5.10	E	07/31/2003	4.4	6(3)	5(3)	3(3)	0(1)	1(1)	2(1)	90(1)	1(5)	74(1)	3(1)	0.0(5)	45(1)	26	
3.40	E	07/31/2003	7.3	19(5)	9(5)	3(3)	2(1)	4(5)	7(5)	56(3)	10(5)	55(1)	39(3)	0.0(5)	643(3)	44	
0.30	E	08/08/2003	12.9	16(5)	6(3)	1(1)	4(3)	3(3)	6(3)	41(3)	21(3)	29(5)	45(3)	0.0(5)	253(3)	40	
<i>Nickel Valley Run - (17-970)</i>																	
Year: 2003																	
0.30	E	07/31/2003	4.0	16(5)	8(5)	4(5)	2(3)	3(5)	6(5)	51(3)	16(3)	55(1)	39(5)	0.0(5)	623(5)	50	
<i>Brushy Fork - (17-971)</i>																	
Year: 2003																	
6.00	E	08/08/2003	8.3	16(5)	7(5)	3(3)	1(1)	4(5)	6(5)	66(1)	23(3)	55(3)	32(3)	0.0(5)	548(3)	42	
4.20	E	08/08/2003	12.3	18(5)	6(3)	1(1)	1(1)	3(3)	4(3)	66(1)	23(3)	40(3)	46(5)	0.0(5)	273(3)	36	
<i>Priest Run - (17-972)</i>																	
Year: 2003																	
0.40	E	08/05/2003	8.2	17(5)	5(3)	2(3)	2(1)	4(5)	6(5)	54(3)	20(3)	55(3)	32(3)	0.0(5)	213(3)	42	
<i>Winding Fork - (17-973)</i>																	
Year: 2003																	

♦ - IBI is low end adjusted.

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** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni- vores	Pioneering fishes	Insect- ivores	DELT anomalies		
4.20	E	07/30/2003	9.5	24(5)	10(5)	6(5)	5(3)	6(5)	9(5)	63(1)	46(1)	75(1)	27(3)	0.1(5)	1733(5)	44
3.10	E	07/30/2003	16.8	24(5)	9(5)	3(3)	6(3)	4(3)	7(5)	47(3)	38(1)	38(3)	38(3)	0.0(5)	488(3)	42
<i>Jug Run - (17-975)</i>																
Year: 2003																
1.60	E	08/20/2003	5.0	18(5)	9(5)	6(5)	3(3)	5(5)	8(5)	66(1)	11(5)	40(3)	20(3)	0.0(5)	1498(5)	50
0.30	E	07/28/2003	6.7	23(5)	8(5)	3(3)	6(5)	5(5)	9(5)	46(3)	27(3)	38(3)	42(5)	0.0(5)	638(5)	52
<i>Harrod Run - (17-977)</i>																
Year: 2003																
2.20	E	07/24/2003	4.0	17(5)	8(5)	3(3)	4(5)	5(5)	7(5)	41(3)	11(5)	45(3)	46(5)	0.0(5)	385(3)	52
1.00	E	07/24/2003	7.1	29(5)	14(5)	5(5)	*(5)	7(5)	13(5)	44(3)	17(3)	49(3)	48(5)	0.0(5)	1355(5)	54
0.20	E	07/25/2003	11.8	27(5)	11(5)	2(3)	*(5)	5(5)	10(5)	50(3)	40(1)	48(3)	33(3)	0.0(5)	1770(5)	48

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals						Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni- vores	Top carnivores	Insect- ivores	DELT anomalies			
Wakatomika Creek - (17960)																	
Year: 2003																	
37.70	E	07/16/2003	33	20(5)	1(1)	0(1)	3(3)	6(5)	31(3)	20(5)	13(5)	2.3(3)	58(5)	0.2(5)	1058(5)	46	9.1
37.70	E	09/09/2003	33	21(5)	3(3)	1(1)	3(3)	5(5)	30(3)	13(5)	8(5)	4.7(3)	49(3)	0.0(5)	1200(5)	46	9.0
36.70	E	07/15/2003	34	25(5)	3(3)	4(5)	5(5)	4(3)	29(3)	27(5)	21(3)	1.5(3)	56(5)	0.0(5)	1352(5)	50	10.1
36.70	E	09/09/2003	34	26(5)	3(3)	4(5)	5(5)	6(5)	24(3)	25(5)	21(3)	3.2(3)	62(5)	0.0(5)	698(3)	50	9.0
31.40	E	07/14/2003	45	26(5)	3(3)	4(5)	7(5)	6(5)	43(5)	15(5)	13(5)	2.6(3)	61(5)	0.0(5)	1294(5)	56	9.7
29.80	E	07/15/2003	47	25(5)	3(3)	4(5)	7(5)	6(5)	50(5)	6(5)	5(5)	4.2(3)	65(5)	0.0(5)	1636(5)	56	10.1
29.80	D	09/09/2003	47	27(5)	3(3)	5(5)	7(5)	7(5)	55(5)	7(5)	4(5)	4.7(3)	67(5)	0.0(5)	722(3)	54	9.4
24.70	D	07/18/2003	58	32(5)	4(5)	4(5)	8(5)	8(5)	42(5)	18(5)	18(5)	2.9(3)	60(5)	0.0(5)	852(5)	58	9.7
24.70	D	09/10/2003	58	32(5)	3(3)	4(5)	8(5)	8(5)	33(3)	15(5)	12(5)	2.8(3)	68(5)	0.0(5)	1154(5)	54	10.0
18.70	D	07/17/2003	120	28(5)	3(3)	5(5)	7(5)	6(5)	45(5)	16(5)	13(5)	5.7(5)	70(5)	0.4(3)	615(3)	54	9.8
18.70	D	09/12/2003	120	34(5)	3(3)	4(3)	9(5)	8(5)	37(5)	29(3)	27(3)	5.0(5)	58(5)	0.0(5)	825(5)	52	10.0
14.90	D	07/17/2003	140	25(5)	3(3)	3(3)	8(5)	6(5)	63(5)	3(5)	2(5)	4.2(3)	76(5)	0.0(5)	936(5)	54	9.6
14.90	D	09/18/2003	140	33(5)	3(3)	5(5)	8(5)	8(5)	55(5)	4(5)	3(5)	6.6(5)	67(5)	0.0(5)	1353(5)	58	10.3
11.70	D	07/22/2003	155	29(5)	4(5)	5(5)	4(3)	3(3)	40(5)	24(3)	22(3)	6.3(5)	66(5)	0.0(5)	416(3)	50	9.1
11.70	D	10/06/2003	155	28(5)	3(3)	4(3)	6(5)	8(5)	38(5)	21(3)	20(3)	5.0(3)	69(5)	0.0(5)	237(3)	48	8.6
6.80	D	07/23/2003	166	33(5)	3(3)	6(5)	6(5)	7(5)	17(1)	30(3)	25(3)	3.6(3)	62(5)	0.0(5)	468(3)	46	8.9
2.30	D	07/22/2003	231	39(5)	3(3)	7(5)	14(5)	10(5)	40(5)	9(5)	8(5)	3.5(3)	81(5)	0.0(5)	1812(5)	56	11.0
L. Wakatomika Creek - (17961)																	
Year: 2003																	
2.80	E	07/16/2003	25	21(5)	2(3)	3(5)	2(3)	5(5)	20(3)	51(1)	37(1)	1.4(3)	43(3)	0.0(5)	494(3)	40	7.8
2.80	E	09/11/2003	25	25(5)	1(1)	3(5)	4(5)	7(5)	20(3)	46(3)	22(3)	1.1(3)	48(3)	0.0(5)	666(3)	44	7.9
0.60	D	07/23/2003	61	22(5)	3(3)	4(5)	2(1)	4(3)	28(3)	37(3)	23(3)	5.8(5)	57(5)	0.0(5)	213(3)	44	8.2
0.60	D	09/11/2003	61	25(5)	3(3)	4(5)	4(3)	5(5)	25(3)	23(5)	14(5)	2.6(3)	75(5)	0.0(5)	266(3)	50	8.0

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals						Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni- vores	Top carnivores	Insect- ivores	DELT anomalies			
Mill Fork - (17962)																	
Year: 2003																	
0.10	E	07/16/2003	24	23(5)	3(3)	2(3)	2(3)	5(5)	19(3)	48(3)	29(3)	1.4(3)	28(3)	0.0(5)	302(3)	42	7.9
0.10	E	09/11/2003	24	23(5)	2(3)	3(5)	2(3)	5(5)	20(3)	37(3)	21(3)	0.9(1)	52(5)	0.0(5)	444(3)	44	8.5
Brushy Fork - (17971)																	
Year: 2003																	
1.90	D	09/08/2003	25	24(5)	4(5)	4(5)	2(3)	1(1)	24(3)	61(1)	50(1)	1.1(3)	37(3)	0.0(5)	332(3)	38	8.3
1.90	D	07/24/2003	25	20(5)	3(3)	4(5)	1(1)	2(3)	26(3)	62(1)	50(1)	1.1(3)	37(3)	0.0(5)	315(3)	36	8.3

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.