

# Beneficial Use Support Document **Rocky River**



Division of Surface Water  
Ecological Assessment Section  
November, 2015

## Recommendations

### **Aquatic Life Use Status**

The Rocky River basin has been subjected to regular monitoring and assessment since the mid-1980s and the 2014 survey marks the third comprehensive study of the watershed by Ohio EPA. As such, the aquatic life use designations for the overwhelming majority of the larger streams within the Rocky River basin have been verified through and in light of biocriteria. However, there remains selected waterbodies where designations for aquatic life use(s) are still based on the original 1978 and 1985 state water quality standards. The techniques in use at that time did not include standardized approaches to the collection of in-stream biological data or numeric biocriteria. While some of the recommendations may appear to constitute “downgrades” (i.e., EWH to WWH) or “upgrades” (i.e., WWH to EWH) any change should not be construed as such because these, in most instances, constitute the first application of an objective and robust data driven process to ascertain the appropriate aquatic life use designation. Ohio EPA is obligated by a 1981 public notice to review and evaluate all aquatic life use designations outside of the WWH use prior to basing any permitting actions on the existing, unverified use designations. Thus, some of the following aquatic life use recommendations constitute a fulfillment of that obligation.

Existing and recommended aquatic life use(s) resulting from the 2014 intensive survey are summarized in Table 1. Affirmation of existing uses, re-designation of existing, yet unverified uses, or designation of previously unlisted waters and other pertinent information, where needed, are presented below. Attainment status based upon existing and recommended uses and associated causes and sources of waters identified as being impaired are presented in Table 2. Stream habitat quality being an important factor in use attainability, a matrix of riparian, channel, and substrate features and resulting QHEI scores, by station and waterbody, are presented in Table 3.

### **Aquatic Life Uses Verified Prior to 2011**

Existing aquatic life designations verified prior to the 2014 biosurvey are affirmed for the streams or stream segments so identified in Table 1. Re-endorsement is based upon either demonstrated ambient biological performance (fish and macrobenthos) consistent with the supporting biocriteria or, a use attainability analysis (UAA) if biology was found to depart from the prescribed criteria.

### **Verification of Existing Aquatic Life Uses**

Existing, yet unverified, aquatic life uses for waterbodies within the Rocky River study area that were designated prior to the promulgation of biocriteria included only four streams: the North Branch tributaries of Remson Creek and Granger Ditch, and two small direct Lake Erie tributaries, Porter and Cahoon Creek. Based upon either demonstrated ambient biological performance, or a UAA, the existing WWH designation was verified for these waters.

### **Redesignation of Verified Aquatic Life Uses**

The MWH designation is recommended to replace the current WWH use for a portion of Abram Creek. Despite its verified status, recent and highly consequential activities within the watershed have rendered affected portions of Abram Creek open to reappraisal and subsequent redesignation.

In 2002, Cleveland Hopkins International Airport (CHIA) enclosed an approximately one mile reach of Abram Creek, between RMs 1.9 and 1.0, to accommodate runway expansion. This activity effectively isolated the heavily urbanized headwaters of Abram Creek from its lower reaches. Compared against the existing WWH biocriteria, all of Abram Creek has remained impaired since it was first surveyed 1992. Although affected by a mix of stressors, use impairment was primarily derived from diffuse urban

sources and storm water from CHIA. Over time and through intervening surveys the nature of the impact on Abram Creek varied, from acute ammonia toxicity associated with the use of urea as a deicer at CHIA, to excessive oxygen demand after urea was replaced with ethylene glycol and related compounds. The findings from the 2014 survey found significant, yet incomplete, recovery through the lower mile of Abram Creek. Improved biology and water quality were attributable to better management of deicing wastes by CHIA. However, Abram Creek still labors under a heavy burden of urban storm water, including but not limited to runoff derived from CHIA. In addition to pollution abatement activities at CHIA, unimpeded access to the Rocky River mainstem is also considered a significant factor in the partial recovery documented in 2014. Following water quality improvements, fish were able to reinvade lower Abram Creek directly from the Rocky River. In terms of aquatic life use recovery, the potential benefits of this nexus are excluded from the headwaters, as the stream enclosure now serves as a permanent barrier to fish passage. Even though impairment documented through the upper reaches of Abram Creek is attributable to anthropogenic sources, its isolation precludes a naturally directed restoration akin to that observed on the lower segment.

The enclosure of a mile of Abram Creek has fundamentally altered the system, and in fact has lowered the potential of upstream segments to support assemblages of aquatic organisms consistent with the WWH biocriteria. Presently, the upper reaches of Abram Creek are functionally unassessed because prior survey results and analysis that gave rise to the existing and verified WWH designation did not include or otherwise envision future enclosure and its attending effects. Given these new structural limitations, the headwaters of Abram Creek are recommended to be designated MWH (channel modified), as it more accurately reflects use potential/attainability. As provided in Table 1, the lower mile of Abram Creek is recommended to retain its current WWH designation.

#### Abram Creek

- Lower limit of CHIA enclosure (RM 1.0) to the mouth - WWH (existing)
- All other segments - WWH to MWH

#### **Unlisted or Undesignated Waters**

Four small waterbodies assessed as part 2014 Rocky River study are currently unlisted in the Ohio WQS. These include two unnamed direct tributaries to the Rocky River, and two indirect West Branch Rocky River tributaries. Recommendations based upon either demonstrated ambient biological performance, or a use attainability analysis (UAA), are provided below.

Unnamed Rocky River Tributary @ RM 12.1 - Undesignated to WWH

Unnamed Rocky River Tributary @ RM 25.4 - Undesignated to WWH

Broadway Creek - Undesignated to WWH

Champion Creek - Undesignated to WWH

#### **State Resource Waters**

Several of the State Resource Water (SRW) listings for waterbodies in the Rocky River basin are recommended for removal (Table 1). Ohio EPA is in the process of re-assigning waterbodies currently listed as SRW in the use designation rules (OAC 3745-1-08 to 32) to a new antidegradation tier under Ohio's antidegradation rule (OAC 3745-1-05). In 2014, Ohio EPA completed a comprehensive biosurvey of the three waterbodies in the Rocky River basin that still carry the old SRW listing (Rocky River, East Branch Rocky River (RM 15.15 to the mouth and headwaters to RM 23), Baldwin Creek). Based on an analysis of that data, along with historic data, most of these water body segments demonstrate attributes consistent with the general high quality water (GHQW) antidegradation category. The current

SRW designation, therefore, no longer has any significance for these waterbodies. Consistent with paragraph (A)(25) of rule 3745-1-05 of the OAC, the SRW designation for the waterbody segments is recommended for removal. These specific stream reaches include:

Baldwin Creek

- at RM 0.48
- all other segments

Rocky River

- State Route 10 (RM 6.4) to the mouth
- Confluence of East and West branches (RM 12.1) to State Route 10 (RM 6.4)

East Branch Rocky River

- Upstream boundaries of Rocky river reservation (RM 15.15) to West Branch confluence
- at RM 5.06

The remaining segments of the East Branch Rocky River are recommended to retain their current SRW listing until such time as the high quality water tables in OAC 3745-1-05 are updated, as portions of these segments show potential for inclusion in one of these tables. Specific biological and habitat characteristics considered for the three SRW waterbodies are summarized in Table 4.

Table 1 - Existing and recommended beneficial use designations for water bodies in the Rocky River basin following the 2014 biological and habitat survey.

Water Body Segment	Use Designations												Comments	
	S R W	Aquatic Life Habitat						Water Supply			Recreation			
		W H	E W H	M W H	S S H	C W H	L R W	P W S	A W S	I W S	B W	P C R		S C R
Porter creek		*/+						*/+	*/+		*/+			
Cahoon creek		*/+						*/+	*/+		*/+			
Rocky river - State route 10 (RM 6.4) to the mouth	+	+			+			+	+		+			
- confluence of East and West branches (RM 12.1) to state route 10	+	+						+	+		+			
Abram creek - airport culvert (RM 1.0) to the mouth		+						+	+		+			
-all other segments			▲					+	+		+			
East branch - upstream boundaries of Rocky river reservation (RM 15.15) to West branch	+	+						+	+		+			
- at RM 5.06	+	+					o	+	+		+			
- within the boundaries of Hinckley reservation	+	+						+	+	+				
- headwaters to Hinckley reservation	+	+						+	+		+			
- all other segments		+						+	+		+			
Baldwin creek - at RM 0.48	+	+					o	+	+		+			
- all other segments	+	+						+	+		+			
Big brook		*						*	*		*			
Unnamed tributary at east branch RM 12.1		▲						▲	▲		▲			
North Royalton "A" tributary		+						+	+		+			
Healy creek		+						+	+		+			
Unnamed tributary at east branch RM 25.4		▲						▲	▲		▲			

Water Body Segment	Use Designations												Comments	
	S R W	Aquatic Life Habitat						Water Supply			Recreation			
		W H	E W H	M W H	S S H	C W H	L R W	P W S	A W S	I W S	B W	P C R		S C R
West branch		+						+	+	+		+		PWS intake - Medina (formerly)
Plum creek		+							+	+		+		
Blodgett Creek (Strongsville "A" tributary) (West Branch RM 4.54)		+							+	+		+		
Baker creek		+							+	+		+		
Cossett creek		+							+	+		+		
Mallet creek		+							+	+		+		
Broadway creek		Δ							Δ	Δ		Δ		
North branch		+							+	+		+		
Plum creek		+							+	+		+		
Remson creek		*/+							*/+	*/+		*/+		
Granger ditch		*/+							*/+	*/+		*/+		
Champion creek (West branch RM 31.47)		Δ							Δ	Δ		Δ		

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

\* - Unverified beneficial use designation based on 1978 Water Quality Standards (WQS).  
 +- Verified beneficial use designation based on the results of a biological field assessment performed by the Ohio EPA.  
 \*/+ - Verification of existing, yet unverified, beneficial use designation based upon the results of this investigation.  
 Δ - Recommended beneficial use designation based on the results of this investigation.

Table 2. Aquatic life use attainment status, Rocky River study area, 2014. Impaired waters are highlighted (mat yellow).

Location	STORET (RM)	Drain. (miles <sup>2</sup> )	IBI	MIwb	ICl <sup>a</sup>	QHEI	Status <sup>b</sup>	Causes	Sources
<b>Rocky River (13-001-000) WWH+</b>									
Ust. North Olmsted WWTP, at ford	T01W19 (11.65) <sup>w</sup>	267.0	45	8.8	50	68.30	FULL		
Dst. North Olmsted WWTP, adj. Park Blvd.	501770 (11.1) <sup>w</sup>	268.0	40	8.1	40	60.50	FULL		
Brook Park Rd.	501780 (9.95) <sup>w</sup>	279.0	39	8.5	44	64.80	FULL		
At Fairview Park	T01W13 (9.0) <sup>w</sup>	281.0	44	9.2	G	81.00	FULL		
Near Mastick Golf Course, at old ford	T01W12 (7.6) <sup>w</sup>	282.0	47	9.2	48	71.50	FULL		
Dst. SR 10	T01W09 (5.8) <sup>w</sup>	289.0	42	8.6	40	71.80	FULL		
Lakewood, at Park Blvd.	501790 (3.0) <sup>w</sup>	291.0	44	9.0	42	83.00	FULL		
Ust. Lakewood WWTP bypass	T01W03 (1.8) <sup>w</sup>	292.0	41	8.8	46	72.50	FULL		
Ust. Detroit Ave., park boat ramp, dst. Lakewood WWTP bypass	T01P02 (1.39) <sup>B</sup>	293.0	41	7.8 <sup>ns</sup>	32 <sup>ns</sup>	67.00	FULL		
<b>Abram Creek (13-002-000) MWH-CM+ (Recommended)</b>									
Dst. Airport storm drain, at Eastland Rd.	T01W76 (3.15) <sup>H</sup>	6.8	18*	-	F	62.0	PARTIAL	Low DO Other flow regime alterations Fish-Passage Barrier (enclosure)	Urban runoff/storm sewers Discharges from MS4 Hydrostructure, Impacts on Fish Passage (enclosure)
Immediately ust. Airport enclosure, at Grayton Rd.	T01P13 (1.9) <sup>H</sup>	8.9	20*	-	LF*	61.8	NON	Low DO Other flow regime alterations Fish-Passage Barrier (enclosure)	Urban runoff/storm sewers Discharges from MS4 Hydrostructure, Impacts on Fish Passage (enclosure)

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Location	STORET (RM)	Drain. (miles <sup>2</sup> )	IBI	MIwb	ICI <sup>a</sup>	QHEI	Status <sup>b</sup>	Causes	Sources
<b>Abram Creek (13-002-000) WWH+</b>									
Dst. Airport enclosure, NASA property, at Cedar Point Rd.	501830 (0.84) <sup>H</sup>	9.7	46	-	F*	62.0	<b>PARTIAL</b>	Other flow regime alterations	Urban runoff/storm sewers Discharges from MS4
Near mouth, at West Area Rd.	T01S04 (0.3) <sup>H</sup>	10.1	54	-	F*	59.0	<b>PARTIAL</b>	Other flow regime alterations	Urban runoff/storm sewers Discharges from MS4
<b>Porter Creek (13-003-000) WWH */+</b>									
Bay Village, at US 6	T01P20 (0.1) <sup>H</sup>	8.3	34*	-	LF*	68.3	<b>NON</b>	Other flow regime alterations	Urban runoff/storm sewers
<b>Cahoon Creek (13-004-000) WWH */+</b>									
Bay Village, at US 6	T01P21 (0.08) <sup>H</sup>	5.4	36 <sup>NS</sup>	-	F*	58.3	<b>PARTIAL</b>	Other flow regime alterations	Urban runoff/storm sewers
<b>E.Br. Rocky River (13-100-000) WWH+</b>									
Rising Valley: Oviatt Rd. (CMP Fish)	302627 (30.8) <sup>H</sup>	7.3	50	-	MG <sup>NS</sup>	71.0	<b>FULL</b>		
SR 303, ust. Camp Hilaka	T01A52 (29.22) <sup>H</sup>	8.9	50	-	MG <sup>NS</sup>	80.5	<b>FULL</b>		
Harter Rd., ust Medina Co. WWTP No. 9	501660 (26.63) <sup>H</sup>	14.3	50	-	56	64.8	<b>FULL</b>		
SR 303, dst. Medina Co. No. 9 WWTP, dst. Hinckley Reservoir	T01S07 (21.98) <sup>W</sup>	25.4	50	9.9	54	78.5	<b>FULL</b>		
Ust. Medina 300 WWTP	T01W41 (18.3) <sup>W</sup>	31.6	45	8.9	48	69.0	<b>FULL</b>		
Private Lane off SR 3, dst. Medina 300 WWTP	T01W38 (17.5) <sup>W</sup>	31.8	47	9.2	46	65.3	<b>FULL</b>		
Bennet Rd., ust. N. Royalton WWTP (via trib.@RM 12.9)	501690 (15.15) <sup>W</sup>	40.0	44	9.2	46	63.8	<b>FULL</b>		
SR 82/Royalton Rd., ust Strongsville B WWTP (via trib.@RM 11.1), and dst. N. Royalton WWTP	T01W33 (11.57) <sup>W</sup>	53.0	43	9.4	44	76.5	<b>FULL</b>		
Mill Stream Run bridge, dst. I-71, dst. Strongsville B WWTP (via Trib. at RM 11.1)	T01W30 (10.0) <sup>W</sup>	57.0	38	8.2	40	53.5	<b>FULL</b>		
Strongsville, between SR 42 and I-71	T01W29 (9.35) <sup>W</sup>	59.0	41	8.7	F*	71.3	<b>PARTIAL</b>	Other Flow Regime Alterations Sedimentation/Siltation	Dam or Impoundment
Adj. parkway, dst. low-head (Note: cyanide fish kill, 2012 from ~RM 9.0 to mouth)	T01W27 (8.2) <sup>W</sup>	60.0	42	9.5	46	69.0	<b>FULL</b>		
Eastland Rd./US 80	T01W25 (7.35) <sup>W</sup>	63.0	39	9.2	48	64.0	<b>FULL</b>		

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Location	STORET (RM)	Drain. (miles <sup>2</sup> )	IBI	MIwb	ICI <sup>a</sup>	QHEI	Status <sup>b</sup>	Causes	Sources
<b>E.Br. Rocky River (13-100-000) WWH+</b>									
Berea, well ust. Baldwin Lake	501720 (6.38) <sup>w</sup>	63.0	45	9.5	40	55.5	FULL		
Dst. Baldwin Lake (dam modification)	T01K04 (5.1) <sup>w</sup>	64.0	42	8.1	40	51.5	FULL		
Dst. old Berea WWTP, at ford	T01P04 (3.06) <sup>w</sup>	75.6	51	9.8	46	68.0	FULL		
Spafford Rd., at ford	501740 (1.28) <sup>w</sup>	76.5	45	9.1	40	70.0	FULL		
<b>E. Br. Tributary @ RM 25.4 (13-100-011) UD, WWH (Recommended)</b>									
Judges East: Picnic Area, off State Rd. (CMP Fish)	302629 (0.1)	2.9	46	-	VG	69.5	FULL		
<b>Healy Creek (13-104-000) WWH+</b>									
Boston Rd.	501630 (0.7) <sup>h</sup>	4.9	46	-	MG <sup>ns</sup>	60.5	FULL		
<b>E. Br. Tributary @ RM 12.1 (13-100-015) UD, WWH (Recommended)</b>									
Royalview: Royalview Rd., Near Mouth (CMP Fish)	302632 (0.1)	1.71	40	-	G	78.0	FULL		
<b>Baldwin Creek (13-101-000) WWH+</b>									
Lucerne Rd., ust. Strongsville C WWTP (N. Royalton B WWTP well ust. at RM 7.3)	T01W53 (3.53) <sup>h</sup>	6.6	42	-	36 (2015)	56.8	FULL		
Big Cr. Parkway, dst. Strongsville C WWTP	501650 (2.61) <sup>h</sup>	8.3	20*	-	32 <sup>ns</sup> (2015)	60.5	NON	Other flow regime alterations	Urban runoff/storm sewers
Eastland Rd.	T01W59 (1.13) <sup>h</sup>	9.6	26*	-	MG <sup>ns</sup>	61.3	NON	Fish-Passage Barrier Other flow regime alterations	Dam or Impoundment Urban runoff/storm sewers
Rocky R. Dr., dst. Coe Lake (dam removal)	T01G01 (0.2) <sup>h</sup>	10.0	46	-	MG <sup>ns</sup>	69.5	FULL		
At mouth (dam removal location)	301231 (0.1) <sup>h</sup>	10.0	50	-	MG <sup>ns</sup>	59.3	FULL		
<b>W. Br. Rocky River (13-200-000) WWH +</b>									
SR 162	501940 (33.55) <sup>h</sup>	9.1	46	-	52	69.0	FULL		
Ridgewood Rd., ust. Town & Country Co-op Inc. (via Tributary), dst. Landfill	301181 (32.26) <sup>h</sup>	11.4	48	-	G	73.5	FULL		
Dst. Medina, at Fenn Rd., dst. N. Br. Rocky River.	501820 (27.3) <sup>w</sup>	69.0	51	9.7	44	72.3	FULL		
Abbeyville at Neff Road	501900 (21.75) <sup>w</sup>	85.0	46	9.1	56	61.5	FULL		

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Location	STORET (RM)	Drain. (miles <sup>2</sup> )	IBI	MIwb	ICI <sup>a</sup>	QHEI	Status <sup>b</sup>	Causes	Sources
<b>W. Br. Rocky River (13-200-000) WWH +</b>									
Grafton Rd.	501890 (16.35) <sup>w</sup>	123.0	41	8.9	46	61.8	FULL		
Adj. West River Rd., dst. Medina Co. No. 500 WWTP (via W.Br. Trib. @ RM 14.8)	T01S11 (13.3) <sup>w</sup>	134.0	47	9.2	48	56.5	FULL		
Columbia Hills Country Club, at foot bridge	501880 (11.7) <sup>w</sup>	-	-	-	42	-	(FULL)		
Adj. West River Rd.	T01W94 (7.4) <sup>w</sup>	145.0	44	9.6	50	61.3	FULL		
Dst. Baker Creek, dst Cuyahoga Landmark Inc., via Trib. at RM 4.9.	T01W90 (4.9) <sup>w</sup>	153.0	45	8.4	50	63.5	FULL		
Bagley Rd., dst. Plum Cr. WWTP (via Plum Cr.)	501860 (3.5) <sup>w</sup>	161.0	42 (2015)	7.4ns (2015)	42	63.8	FULL		
Adj. Lewis Rd.	T01S09 (2.1) <sup>w</sup>	181.0	47	9.2	48	64.3	FULL		
Lewis Rd.	501850 (0.39) <sup>w</sup>	190.0	48	9.1	46	64.5	FULL		
<b>Blodgett Creek (13-200-003) WWH+</b>									
Ust. old Strongsville A WWTP	T01A17 (1.61) <sup>H</sup>	3.1	24*	-	MG <sup>ns</sup>	58.8	NON	Other flow regime alterations Direct habitat alterations Fish passage barrier	Urban runoff/storm sewers Channelization Hydrostructure Impacts on Fish Passage (Box Culvert)
Lindbergh Rd., dst old Strongsville A WWTP	T01A23 (0.17) <sup>H</sup>	4.1	44	-	F*	58.0	PARTIAL	Other flow regime alterations Natural (flow or habitat)	Urban runoff/storm sewers Natural sources
<b>Champion Creek (13-200-009) UD, WWH (Recommended)</b>									
At mouth, dst. Smith Rd.	T01A55 (0.01) <sup>H</sup>	7.8	48	-	MG <sup>ns</sup>	69.8	FULL		
<b>Broadway Creek (13-200-013) UD, WWH (Recommended)</b>									
Foot Rd.	302574 (0.28) <sup>H</sup>	2.0	52	-	MG <sup>ns</sup>	67.3	FULL		
<b>Plum Creek 13-201-000 WWH+ (W.Br)</b>									
Akins Rd.	T01K11 (8.5) <sup>H</sup>	7.6	22*	-	MG <sup>ns</sup>	51.5	NON	Low DO Habitat Alterations	Natural sources (rheopalustrine) Channelization
Jaquay Rd., ust Ohio Utility Co. WWTP	T01A33 (4.92) <sup>H</sup>	14.3	24*	-	MG <sup>ns</sup>	60.5	NON	Low DO Habitat Alterations	Natural sources (rheopalustrine) Channelization

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Location	STORET (RM)	Drain. (miles <sup>2</sup> )	IBI	MIwb	ICl <sup>a</sup>	QHEI	Status <sup>b</sup>	Causes	Sources
<b>Plum Creek 13-201-000 WWH+ (W.Br)</b>									
Ohio Turnpike, dst. Ohio Utility Co. WWTP	T01P23 (2.5) <sup>H</sup>	16.2	<u>22</u> *	-	MG <sup>ns</sup>	69.8	<b>NON</b>	Fish passage barrier Other flow regime alterations	Natural sources (Plum Cr. Gorge) Urban runoff/storm sewers
Columbia Rd., dst. Old-Brentwood WWTP	501950 (0.25) <sup>H</sup>	17.6	<u>20</u> *	-	MG <sup>ns</sup>	69.5	<b>NON</b>	Fish passage barrier Other flow regime alterations	Natural sources (Plum Cr. Gorge) Urban runoff/storm sewers
<b>Baker Creek (13-202-000) WWH+</b>									
Sprague Rd.	T01S13 (0.3)	5.8	40	-	MG <sup>ns</sup>	63.3	<b>FULL</b>		
<b>Cossett Creek (13-203-000) WWH+</b>									
SR 252	T01K12 (0.2) <sup>H</sup>	4.1	<u>24</u> *	-	G	63.3	<b>NON</b>	Natural (flow or habitat)	Natural sources
<b>Mallet Creek (13-204-000) WWH+</b>									
SR 57	T01K13 (3.5) <sup>H</sup>	13.7	48	-	MG <sup>ns</sup>	57.0	<b>FULL</b>		
Neff Rd.	T01S14 (0.72) <sup>H</sup>	16.1	52	-	MG <sup>ns</sup>	62.8	<b>FULL</b>		
<b>N.Br. Rocky River 13-205-000 WWH+</b>									
Remsen Rd.	T01S15 (5.52) <sup>H</sup>	28.1	47	7.8 <sup>ns</sup>	50	69.8	<b>FULL</b>		
Granger Rd.	501960 (0.45) <sup>H</sup>	36.3	54	9.7	E	67.5	<b>FULL</b>		
<b>Plum Creek (13-206-000) WWH+ (N.Br.)</b>									
Carpenter Rd.	501840 (3.02) <sup>H</sup>	8.8	50	-	F*	69.5	<b>PARTIAL</b>	Other flow regime alterations	Urban runoff/stormwater
adj. Carpenter Rd., ust old Medina 500 WWTP	T01K14 (2.5) <sup>H</sup>	10.4	46	-	F*	70.8	<b>PARTIAL</b>	Other flow regime alterations	Urban runoff/stormwater
SR 3/I 71, near mouth	302573 (0.50) <sup>H</sup>	12.1	48		MG <sup>ns</sup>	73.8	<b>FULL</b>		
<b>Remson Creek (13-208-000) WWH*/+</b>									
Remsen Rd.	302575 (0.6) <sup>H</sup>	14.4	48	-	G	70.8	<b>FULL</b>		
<b>Granger Ditch (13-208-000) WWH*/+</b>									
SR 94, ust. Medina Co No. 11 WWTP (via trib. at RM 2.1)	302577 (1.75) <sup>H</sup>	7.8	42	-	F*	45.5	<b>PARTIAL</b>	Natural (flow or habitat) Habitat Alterations	Natural sources (rheopalustrine) Channelization

Table 2. Aquatic life use attainment status, Rocky River study area, 2014. Impaired waters are highlighted (mat yellow).

Location	STORET (RM)	Drain. (miles <sup>2</sup> )	IBI	MIwb	ICI <sup>a</sup>	QHEI	Status <sup>b</sup>	Causes	Sources
<b>Granger Ditch (13-208-000) WWH*/+</b>									
Stoney Hill Rd., dst. Highland HS WWTP, dst. Medina Co No. 11 WWTP	302576 (0.2) <sup>h</sup>	13.3	38 <sup>ns</sup>	-	G	49.3	FULL		
<p>H - Headwaters: sites draining areas ≤ 20 miles<sup>2</sup>.                      W - Wadable streams: sites draining areas &gt; 20 miles<sup>2</sup>.                      B - Boat sites: large or deep waters, necessitating the use of Boat sampling methods.                      ns - Non-significant departure from the bio criteria (≤4 IBI units or ≤0.5 MIwb units).                      * - Significant departure from the biocriteria (&gt;4 IBI units or &gt;0.5 MIwb units).                      a - Narrative evaluation used in lieu of ICI (E=exceptional, G=good, MG=marginally good, F=fair, P=poor, and VP=very poor)                      b - Attainment status based upon one organism group is parenthetically express.                      + - Aquatic life use designation field verified by previous investigation(s).                      */+ - Field verified/recommended aquatic life use designation(s) based upon the results from the 2014 survey of Rocky River, superseding previous unverified status.</p>									
	<b>Erie-Ontario Lake Plain (EOLP) Ecoregion</b>								
	<b>INDEX - Site Type</b>				<b>WWH</b>	<b>EWH</b>	<b>MWH<sup>c</sup></b>		
	IBI - Headwater				40	50	24		
	IBI - Wading				38	50	24		
	IBI - Boat				40	48	24		
	MIwb - Wading				7.9	9.4	6.2		
	MIwb - Boat				8.7	9.6	5.8		
	ICI				34	46	22		
	c - Modified Warmwater Habitat (MWH) for channel modified or impounded areas								

Table 3. Matrix of macrohabitat features, Rocky River survey, 2014.

**QHEI Attributes: Rocky River Basin 2014 TMDL**

Key QHEI Components			WWH Attributes						MWH Attributes													
River Mile	QHEI	Gradient (ft/mi)	WWH Attributes						High Influence			Moderate Influence			M.I. Modified Attributes	MWH H.I.+1/MWH+1 Ratio	MWH M.I./MWH Ratio					
			Boulder/Cobble/Gravel Substrates Not Channelized or Recovered	Good/Excellent Development	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low/Normal Embeddedness	Max Depth >40cm	Channelized/No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	High-influence Modified Attributes				Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Fair/Poor Development	Low Sinuosity	Only 1 or 2 Cover Types
<b>13-001-000</b>																						
<b>Year: 2014</b>																						
11.6	68.3	7.25	X				X X X	4		X	1	X	X X	X						4	0.40	1.20
11.1	60.5	7.25	X				X X X	4		X X	2		X X	X X						4	0.60	1.20
9.9	64.8	8.55	X				X X X	4		X X	2		X	X						2	0.60	0.80
9.0	81.0	6.13	X X	X X X	X X X	X X X	X X X	9			0	X		X						3	0.10	0.50
7.6	71.5	6.13	X X	X	X	X X X	X X X	7		X	1	X	X X	X						4	0.38	0.75
5.8	71.8	7.63	X X			X X X	X X X	5		X	1		X X	X						3	0.33	0.83
3.0	83.0	8.85	X X	X X X	X X	X X	X X	8			0	X	X	X						3	0.11	0.56
1.7	72.5	4.54	X X	X	X X	X X	X X	7		X	1	X	X X	X						4	0.25	0.75
1.1	67.0	4.54	X X	X			X	4	X	X	2	X		X	X X					5	0.60	1.40
<b>13-002-000</b>																						
<b>Year: 2014</b>																						
3.3	62.0	19.23	X				X	2		X	1	X X	X X	X X X						7	1.00	3.00
1.9	61.8	40.00	X		X		X X	4		X	1	X X	X X	X X	X					7	0.60	1.80
0.8	62.0	111.11	X X	X X	X X X	X X X	X X X	8		X	1			X						2	0.22	0.33
0.1	59.0	41.60	X X				X X X	5		X	1		X X	X X						4	0.33	0.83
<b>13-003-000</b>																						
<b>Year: 2014</b>																						
0.4	68.3	20.00	X X	X X X	X X X	X X X	X X X	8		X	1		X	X X						3	0.22	0.44
<b>13-004-000</b>																						
<b>Year: 2014</b>																						
0.2	58.3	71.42	X	X X X	X X X	X X X	X X X	8		X	1		X	X						2	0.22	0.33
<b>13-100-000</b>																						
<b>Year: 2014</b>																						
30.8	71.0	64.00	X X	X X	X X X	X X X	X X X	7		X	1	X								2	0.25	0.50
29.5	80.5	26.32	X X	X X X	X X X	X X X	X X X	9			0	X								1	0.10	0.30
26.1	64.8	19.23	X X		X		X X	5		X	1	X	X X	X X X X						7	0.33	1.50
21.9	78.5	12.19	X X	X X X	X X	X X	X X	8			0	X		X						2	0.11	0.44
18.3	69.0	5.71	X X	X X X	X X	X X	X X	8		X	1	X	X							4	0.22	0.67
17.5	65.3	5.71		X X X			X	4		X	1	X X	X	X X X						6	0.60	1.60

**QHEI Attributes: Rocky River Basin 2014 TMDL**

Key  
QHEI  
Components

WWH Attributes

MWH Attributes

High Influence

Moderate Influence

River  
Mile

QHEI

Gradient  
(ft/mi)

Low/Normal Riffle Embeddedness  
Max Depth > 40cm  
Low/Normal Embeddedness  
Fast Current/Eddies  
Extensive/Moderate Cover  
Moderate/High Sinuosity  
Good/Excellent Development  
Silt Free Substrates  
Boulder/Cobble/Gravel Substrates  
Not Channelized or Recovered

WWH Attributes

Channelized/No Recovery  
Silt/Muck Substrates  
No Sinuosity  
Sparse/No Cover  
Max Depth < 40cm

High-influence Modified Attributes

Recovering Channel  
Heavy/Moderate Silt Cover  
Sand Substrates (Boat)  
Hardpan Substrate Origin  
Fair/Poor Development  
Low Sinuosity  
Only 1 or 2 Cover Types  
Intermittent/Poor Pools  
No Fast Current

No Riffle  
High/Mod. Riffle Embeddedness  
High/Moderate Embeddedness

M.I. Modified Attributes

MW/H H.I.+1/MW/H+1 Ratio

MW/H M.I./MW/H Ratio

**13-100-000**

Year: 2014

15.2	63.8	4.74	X		X	X	3	X	1	X X	X X	X X X	7	0.75	2.25
11.6	76.5	32.26	X X	X	X X	X	6		0	X	X	X X	4	0.14	0.71
10.0	53.5	6.33	X			X X X	4	X X	2	X X	X X	X X X X	8	0.80	1.80
9.4	71.3	6.17	X	X	X	X X	5		0	X	X	X X	4	0.17	1.00
8.2	69.0	7.58	X X		X X	X X	6	X	1	X	X X	X X	5	0.29	0.86
7.4	64.0	7.58	X		X	X X	4	X X	2	X	X X	X X X	6	0.60	1.40
6.3	55.5	4.29	X			X X	3	X	1	X	X X	X X X	6	0.50	1.75
5.2	51.5	4.31				X	1	X X X	3	X X	X	X X	6	2.00	4.00
3.1	68.0	43.48	X		X X X X	X X X	5	X	1		X X		2	0.33	0.67
1.2	70.0	8.47	X			X X X	4	X	1	X	X X	X	4	0.40	1.00

**13-100-011**

Year: 2014

0.1	69.5	100.00	X X	X X X X	X	7			0	X		X X	3	0.13	0.63
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**13-100-015**

Year: 2014

0.1	78.0	50.00	X X	X X X X X X X	X X X	9			0				0	0.10	0.20
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**13-101-000**

Year: 2014

3.5	56.8	58.82	X		X	X X X	5	X	1	X	X X	X	4	0.50	1.00
2.6	60.5	6.25			X	X X X	4	X	1	X X	X X	X X	6	0.60	1.60
1.1	61.3	7.52	X	X	X	X X	5	X	1	X X	X X	X X X	7	0.50	1.33
0.3	69.5	7.52	X	X	X	X	4	X	1	X	X X	X X X	6	0.60	1.40
0.1	59.3	7.52	X		X	X	3	X	1	X	X X X X	X X	7	0.75	2.00

**13-104-000**

Year: 2014

0.8	68.3	35.71	X X		X	X X X	6	X	1		X X	X X	4	0.29	0.71
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**13-200-000**

Year: 2014

33.5	69.0	13.33	X X	X X X	X X X	8	X	1	X	X		X X X	5	0.22	0.67
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**QHEI Attributes: Rocky River Basin 2014 TMDL**

Key QHEI Components

WWH Attributes

MWH Attributes

High Influence

Moderate Influence

River Mile QHEI Gradient (ft/mi)

Low/Normal Riffle Embeddedness  
Max Depth>40cm  
Low/Normal Embeddedness  
Fast Current/Eddies  
Extensive/Moderate Cover  
Moderate/High Sinuosity  
Good/Excellent Development  
Silt Free Substrates  
Boulder/Cobble/Gravel Substrates  
Not Channelized or Recovered

WWH Attributes

Channelized/No Recovery  
Silt/Muck Substrates  
No Sinuosity  
Sparse/No Cover  
Max Depth <40cm

High-influence Modified Attributes

High/Mod. Riffle Embeddedness  
High/Moderate Embeddedness  
No Fast Current  
Intermittent/Poor Pools  
Only 1 or 2 Cover Types  
Low Sinuosity  
Fair/Poor Development  
Hardpan Substrate Origin  
Sand Substrates (Boat)  
Heavy/Moderate Silt Cover  
Recovering Channel

M.I. Modified Attributes  
MMW H.I.+1/MMWH+1 Ratio  
MMW M.I./MMW Ratio

**13-200-000**

Year: 2014

32.3	73.5	13.70	X X	X X X	X X X	8			0	X			X X X	4	0.11	0.67
27.4	72.3	3.48	X X	X	X X X X	8		X	1	X		X	X	3	0.22	0.44
21.7	61.5	15.15	X	X		5		X	1		X X	X X		4	0.33	0.83
16.4	61.8	8.77	X			2		X	1	X	X X		X X X	6	0.67	2.33
13.1	56.5	2.65	X		X X	5		X	1	X	X X		X X	5	0.33	1.17
7.1	61.3	2.05	X	X		4		X	1	X		X	X X	5	0.40	1.20
4.7	63.5	8.77	X			5		X	1	X	X X		X	5	0.33	1.00
3.5	63.8	14.49	X		X X	7		X	1	X		X	X X	4	0.25	0.63
1.7	64.3	16.67	X	X		5		X	1		X X		X	3	0.33	0.67
0.4	64.5	11.63	X			5		X	1		X X			2	0.33	0.50

Year: 2015

3.5	68.8	14.49	X		X X	7		X	1					0	0.25	0.13
3.4	70.8	14.49	X		X X	7		X	1		X			1	0.25	0.25

**13-200-003**

Year: 2014

1.3	58.8	16.67	X		X	4		X X	2	X X	X X	X X X		7	0.80	1.60
0.2	58.0	39.53	X			4		X	1	X	X X	X X		5	0.60	1.20

**13-200-009**

Year: 2014

0.1	69.8	17.24	X X X X X X X X X X			10		X	1	X	X X			3	0.27	0.46
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**13-200-013**

Year: 2014

0.3	67.3	35.71	X X	X X X	X X X	8		X	1	X	X	X X X		5	0.22	0.67
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**13-201-000**

Year: 2014

8.5	51.5	9.26	X			1		X X	2	X X	X X	X X X		7	2.00	4.50
4.9	65.0	6.17	X			2		X	1	X X	X X	X X X		7	1.00	3.00
2.6	69.8	12.05	X X		X X	5			0	X	X X	X X X X		7	0.17	1.33
0.1	69.5	20.41	X X X		X	7			0		X X	X X		4	0.13	0.63

**QHEI Attributes: Rocky River Basin 2014 TMDL**

Key QHEI Components			WWH Attributes					MWH Attributes																					
River Mile	QHEI	Gradient (ft/mi)	WWH Attributes					High Influence		Moderate Influence			M.I. Modified Attributes	MWH H.I.+1/MWH+1 Ratio	MWH M.I./MWH Ratio														
			Boulder/Cobble/Gravel Substrates Not Channelized or Recovered	Good/Excellent Development	Moderate/High Sinuosity	Extensive/Moderate Cover	Low/Normal Embeddedness	Fast Current/Eddies	Low/Normal Embeddedness	Max Depth <40cm	Channelized/No Recovery	Silt/Muck Substrates				No Sinuosity	Sparse/No Cover	High-influence Modified Attributes	High/Mod. Riffle Embeddedness	High/Moderate Embeddedness	No Fast Current	Intermittent/Poor Pools	Only 1 or 2 Cover Types	Low Sinuosity	Fair/Poor Development	Hardpan Substrate Origin	Sand Substrates (Boat)	Heavy/Moderate Silt Cover	Recovering Channel
<b>13-202-000</b>																													
<b>Year: 2014</b>																													
0.3	63.3	37.03	X	X		X		X	X	X	6			X		1				X		X	X			3	0.29	0.57	
<b>13-203-000</b>																													
<b>Year: 2014</b>																													
0.1	63.3	23.33	X	X		X		X	X	X	6			X		1		X		X	X	X	X	X			6	0.29	1.00
<b>13-204-000</b>																													
<b>Year: 2014</b>																													
3.5	57.0	4.74	X			X		X	X	X	5			X		1		X		X		X	X			4	0.33	0.83	
0.7	62.8	37.04	X			X	X	X	X	X	6			X		1		X		X		X			2	0.29	0.43		
<b>13-205-000</b>																													
<b>Year: 2014</b>																													
5.5	69.8	12.05	X	X		X	X	X	X	X	7			X		1		X		X		X	X			4	0.25	0.75	
0.4	67.5	18.52	X			X	X	X	X	X	6			X		1		X	X		X	X	X	X		6	0.43	1.00	
<b>13-206-000</b>																													
<b>Year: 2014</b>																													
3.1	69.5	14.71	X	X		X	X	X	X	X	7			X		1				X		X			2	0.25	0.50		
2.5	70.8	10.00	X	X		X	X	X		X	X	7			X		1		X		X		X	X		4	0.25	0.75	
0.7	73.8	20.00	X	X		X	X	X	X	X	7			X		1		X		X		X			3	0.38	0.63		
<b>13-207-000</b>																													
<b>Year: 2014</b>																													
0.6	70.8	6.33	X	X				X	X	X	5			X		1		X		X	X	X	X			5	0.50	1.00	
<b>13-208-000</b>																													
<b>Year: 2014</b>																													
1.7	45.5	7.46				X		X			2		X	X		2		X	X		X	X	X	X	7	1.33	3.00		
0.2	49.3	6.33				X		X			2			X		1		X	X		X	X	X	X	7	1.00	3.00		

Table 4. Summary of Biological and Habitat Characteristics of SRW Streams in the Rocky River drainage basin.

<b>13-001-000 Rocky River</b>																
<i>GHQW</i>	LRM	URM	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
	0.0	10.0	<i>FISH</i> Bigmouth Shiner	T 1	42.1	0.00	5.33	8.6	20	45.1	11	9	12.6	0	11	72.6
<i>GHQW</i>	10.0	20.0	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
			<i>FISH</i> Bigmouth Shiner	T 8	43.4	0.00	0.45	9.0	10	44.8	0	5	13.8	0	5	65.6
<i>GHQW</i>	10.0	20.0	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
			<i>FISH</i> Bigmouth Shiner	T 8	43.4	0.00	0.45	9.0	10	44.8	0	5	13.8	0	5	65.6
<i>OSW</i>	20.0	30.0	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
			<i>FISH</i> Bigmouth Shiner	T 5	50.0	0.00	6.50	9.9	5	55.0	100	2	17.0	33	3	75.7
<b>13-100-000 East Branch Rocky River</b>																
<i>GHQW</i>	LRM	URM	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
	0.1	10.0	<i>FISH</i> Bigmouth Shiner	T 469	43.1	6.25	0.02	9.1	16	42.8	0	8	8.8	0	9	65.9
<i>GHQW</i>	30.0	40.0	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
			<i>FISH</i> Bigmouth Shiner	T 1	50.0	0.00	1.03	0.0	1	0.0	0	0	7.0	0	1	71.0
<b>13-101-000 Baldwin Creek</b>																
<i>GHQW</i>	LRM	URM	RTE Species	# Obs.*	Mean IBI	% in 95th%	% Sensitive**	Mean MIWb	n	Mean ICI	% in 95th%	ICI n	Mean EPT	% in 95th%	EPT n	Mean QHEI
	0.1	7.4	<i>FISH</i> Bigmouth Shiner	T 234	34.5	0.00	0.00	0.0	11	34.0	0	2	5.5	0	13	65.0

\* existing or default category

\*includes presence/absence samples

\*\*italic font indicates value exceeds 2 SD from the size/region stratum mean; bold italic font indicates the value exceeds 3 SD from the size/region stratum mean

12/3/2015