

# Biological and Water Quality Study of the Big Darby Creek Watershed



Division of Surface Water  
Ecological Assessment Section  
November, 2015

## Recommendations

Streams in the Big Darby Creek watershed currently listed in the [Ohio Water Quality Standards](#) (WQS) are assigned one or more of the following aquatic life use designations: Warmwater Habitat (WWH), Exceptional Warmwater Habitat (EWH), Modified Warmwater Habitat - Channelization (MWH-C), and Coldwater Habitat (CWH). The aquatic life use designations for the majority of streams in this survey have been previously verified using biological data. Many streams in Ohio were originally designated for aquatic life use in the 1978 Ohio WQS, but the techniques used then did not include standardized approaches to the collection of instream biological data or numerical biological criteria. This study used biological data to assess current condition and then verify or recommend aquatic life uses for streams in the Big Darby Creek study area.

Two streams, McCoy Run and an Unnamed Tributary to Big Darby Creek at RM 23.61, have not been previously assigned aquatic life, water supply, or recreation beneficial use designations. These streams will be given appropriate use designations based on 2014 sampling data.

Lake Run, a tributary to Little Darby Creek, has an EWH use designation that was not previously confirmed by standardized approaches to the collection of instream biological data or numerical biological criteria, despite being sampled during the 2001 watershed survey.

Twenty-nine streams in the Big Darby Creek study area were evaluated for aquatic life and recreational use potential in 2014-15 (Table 2). Significant findings include the following:

- Eight streams or stream segments with an existing EWH use designation should be retained. These include Big Darby Creek from RM 79.23 to the mouth, Pleasant Run, Little Darby Creek from RM 36.9 to the mouth, Proctor Run, Treacle Creek, Spring Fork, Smith Ditch, and Hellbranch Run from RM 5.04 to the mouth.
- Twelve streams or stream segments with an existing WWH use designation should be retained. These include Buck Run, Robinson Run, Sweeny Run, Sugar Run, Worthington Ditch, Ballenger-Jones Ditch, Fitzgerald Ditch, Barron Creek, Wamp Ditch, Hellbranch Run upstream RM 5.04, Hamilton Run from RM 2.1 to the mouth, and Clover Groff Run from RM 2.5 to the mouth.
- Four streams or stream segments with an existing dual EWH/CWH use designation should be retained. These include Big Darby Creek from the headwaters to RM 79.23, Little Darby Creek (Logan Co.), Spain Creek, and Little Darby Creek from the headwaters to RM 36.9.
- Three streams or stream segments with a MWH-C use designation should be retained. These include Flat Branch, Hamilton Run from the headwaters to RM 2.1, and Clover Groff Run from the headwaters to RM 2.5.
- Lake Run, a tributary that joins Little Darby Creek near Mechanicsburg, has an EWH use designation that was not previously verified by standardized approaches to the collection of

instream biological data or numerical biological criteria, despite being sampled during the 2001 watershed survey. Sampling from 2014 indicated that the EWH use designation is consistent with observed biological conditions and thus, can be confirmed EWH.

- Jumping Run, a small tributary to Lake Run, currently has a verified WWH use designation. Biological sampling results from 2014 indicated that this stream is fully capable up supporting aquatic communities consistent with expectations for an EWH designated stream. The aquatic life use of Lake Run is therefore being recommended changed from WWH to EWH.
- Clover Run, a small tributary to the headwaters of Little Darby Creek, currently has a verified WWH use designation. Biological sampling from 2014 indicated that this stream possesses an appropriate thermal regime and the requisite biology to be considered a CWH stream. Seven cold-water macroinvertebrate and one cold-water fish (mottled sculpin) taxa were collected. Cold-water fish taxa comprised approximately 20% of the overall fish community. Therefore, Clover Run is being recommended changed from WWH to CWH.
- Springwater Run, a small tributary to Big Darby Creek, currently has a verified WWH use designation. Biological sampling from 2014 indicated that this stream possesses an appropriate thermal regime and the requisite biology to be considered a CWH stream. Three cold-water macroinvertebrate and two cold-water fish taxa (mottled sculpin, s. redbelly dace) were collected. Coldwater fish taxa comprised approximately 28% of the overall fish community.
- The unnamed tributary to Big Darby Creek at RM 23.61 currently is undesignated in the WQS and therefore, does not have an assigned aquatic life use. Biological sampling from 2014 indicated that this stream possesses an appropriate thermal regime and the requisite biology to be considered a CWH stream. Five cold-water macroinvertebrate and one cold-water fish taxa (mottled sculpin) were collected. Cold-water fish taxa comprised approximately 10.5% of the overall fish community. Therefore, the unnamed tributary to Big Darby Creek at RM 23.66 is being recommended CWH.
- McCoy Run is currently undesignated with the WQS and therefore, does not have an assigned aquatic life use. Biological sampling from 2014 indicated macroinvertebrate community performance in the marginally good range, while fish community performance was found to be in the poor range. Habitat quality as indicated by the QHEI can generally be considered fair. Many negative habitat attributes at this location can be attributed to historical channelization activities. McCoy Run also has characteristics of a wetland-type stream, such as the dominant substrate types and the ubiquitous presence of aquatic macrophytes, which can naturally limit biological performance, especially with regard to the fish community. Given more time to recover from historical channelization activities, a fish community consistent with expectations for a WWH stream should not be un-obtainable.

No streams in the Big Darby Creek study area evaluated in 2014-15 have public drinking water intakes and therefore, do not have a Public Water Supply (PWS) use designation. All streams with existing Agricultural Water Supply (AWS), Industrial Water Supply (IWS), Primary Contact Recreation (PCR), or

Secondary Contact Recreation (SCR) use designations should retain their respective designations. Two streams, McCoy Run and unnamed tributary to Big Darby Creek at 23.61, were previously undesignated in the WQS and therefore, were not previously assigned any of the aforementioned use designations. It is recommended that these two streams be assigned AWS, IWS, and PCR beneficial uses.

The entire lengths of Big and Little Darby creeks are listed as an Outstanding State Water (OSW) based on exceptional ecological values listed in the antidegradation rule (OAC 3745-1-05) of the Ohio Water Quality Standards. Hellbranch Run from RM 5.04 to the mouth, Little Darby Creek (Logan Co.), Proctor Run, Spain Creek, and Spring Fork are listed as Superior High Quality Waters based on their exceptional ecological values listed in the antidegradation rule (OAC 3745-1-05) of the Ohio Water Quality Standards. These streams were listed based on a high level of biological integrity. Included in evaluating exceptional biological value were determinations of presence of declining fish species, high quality habitat to support declining and threatened fish species, and a display of biological integrity equivalent to or exceeding exceptional biological communities listed in rule 3745-1-07 of the Ohio Administrative Code.

Table 1 - Use designations for water bodies in the Darby Creek drainage basin.

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
Big Darby creek - twp. rd. 157 (RM 79.23) to the mouth			+					+	+		+			
- headwaters to twp. rd. 157			+			+		+	+		+			
Georges run (creek)		+						+	+			+		
Greenbrier creek		+						+	+		*			
Unnamed tributary (Big Darby creek RM 18.41)		+						+	+				+	
Unnamed tributary (Big Darby creek RM 20.2)		+						+	+		+			
Unnamed tributary (Big Darby creek RM 23.61)						▲		▲	▲		▲			
Unnamed tributary (Big Darby creek RM 23.77)		+						+	+				+	
Springwater run		+				▲		+	+		+			
Hellbranch run - Kropp rd. (RM 5.04) to the mouth			+					+	+		+			
- all other segments		+						+	+		+			
Clover Groff ditch - headwaters to Feder rd.				+				+	+		+			ECBP ecoregion - channel modification
- Feder rd. (RM 2.5) to the mouth		+						+	+		+			
Hamilton ditch - headwaters to Feder rd. (RM 2.1)				+				+	+		+			ECBP ecoregion - channel modification
- Feder rd. to the mouth		+						+	+		+			
McCoy run (Hamilton ditch RM 0.56)		▲						▲	▲		▲			
Gay run		+						+	+		+			
Smith ditch - unnamed tributary adjacent Lilly Chapel rd. at RM 3.7 to the mouth			+					+	+		+			
Unnamed tributary (Smith ditch RM 0.06)			+					+	+		+			

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
Little Darby creek - Lake run (RM 36.9) to the mouth - headwaters to Lake run		+						+	+		+		
Spring fork		+						+	+		+		
Bales ditch (Spring fork RM 3.64) - downstream st. rte. 29 (RM 1.3) to the mouth	+							+	+			+	
Wamp ditch - adjacent Finley-Guy rd. (RM 0.4) to the mouth	+							+	+			+	
Barron creek - Rosedale-Plain city rd. (RM 2.1) to the mouth - headwaters to Rosedale-Plain city rd.	+		*					+	+			+	
Treacle creek		+						+	+		+		
Proctor run		+						+	+		+		
Howard run		+						+	+		+		
Lake run		*/+						+	+		+		
Jumping run - adjacent Bullard-Rutan rd. (RM 1.5) to the mouth - headwaters to Bullard-Rutan rd.	+	Δ						+	+		+		
Clover run	+					Δ		+	+			+	
Fitzgerald ditch (Threemile run) - RM 1.65 (terminus of county maintenance) to the mouth - headwaters to RM 1.65	+							+	+		+		
Yutzy ditch - adjacent Price-Hilliards rd. (RM 1.0) to the mouth		*						*	*		*		
Ballengier-Jones ditch - U.S. rte. 42 (RM 2.4) to the mouth	+							+	+		+		
Worthington ditch - upstream Plain city-Georgesville rd. (RM 1.0) to the mouth	+							+	+		+		

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
Sugar run - headwaters to Taylor rd. (RM 6.7) - all other segments				+					+	+		+		ECBP ecoregion - channel modification
Sweeney run - Lafayette-Plain city rd. (RM 1.8) to the mouth		+							+	+		+		
Robinson run		+							+	+		+		
Sugar run		+							+	+		*		
Buck run		+							+	+		+		
Prairie run		+							+	+		*		
Hay run - upstream Mechanicsburg-Plain city rd. (RM 0.5) to the mouth - headwaters to Mechanicsburg-Plain city rd.			+						+	+		+		
Unnamed tributary (Big Darby creek RM 69.4)		+							*	*		*		
Pleasant run				+					+	+		+		
Spain creek - headwaters to Erie-Lackawanna railroad crossing (RM 5.0) - all other segments		+				+			+	+		+		
Unnamed tributary (Big Darby creek RM 74.91)				+					+	+			+	
Little Darby creek (Big Darby creek RM 78.34)				+		+			+	+		+		
Flat branch				+					+	+		+		ECBP ecoregion - channel modification

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

Table 2. Aquatic life use attainment status for stations sampled in the Big Darby Creek study area based on data collected June-October 2014. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores based on the performance of the biological communities. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat of the stream to support a biotic community. The Big Darby Creek watershed is located within the Eastern Corn Belt Plains (ECBP) ecoregion. If biological impairment has occurred, the cause(s) and source(s) of the impairment are noted. Specific sampling locations for fish and macroinvertebrates may differ slightly from what is listed in the below table; any differences are contained within the results tables in their respective sections. NA = not applicable.

Location	STORET (RM) <sup>a</sup>	DRAIN. (MI <sup>2</sup> )	IBI	MIwb <sup>b</sup>	ICI <sup>c</sup>	QHEI	Status <sup>d</sup>	Causes	Sources
<b>Big Darby Creek (02-200-000) EWH &amp; CWH Existing</b>									
In headwaters at private residence	V06K07 (83.20)	1.5 <sup>H</sup>	54	N/A	51	77.25	<b>FULL</b>		
S. of East Liberty, upstream lane off Old US 33	300621 (81.90)	2.2 <sup>H</sup>	54	N/A	56	58.00	<b>FULL</b>		
At lane off Old US Route 33	V06K05 (81.60)	3.0 <sup>H</sup>	50	N/A	54	57.25	<b>FULL</b>		
N.E. of Middleburg, approximately 0.4 mi. upst. State Route 287	300620 (81.10)	3.2 <sup>H</sup>	54	N/A	56	67.50	<b>FULL</b>		
N.E. of Middleburg at State Route 287	V07P62 (80.75)	4.5 <sup>H</sup>	56	N/A	56	71.50	<b>FULL</b>		
S.E. of Middleburg at County Road 157	V07S57 (79.23)	5.6 <sup>H</sup>	50	N/A	58	55.25	<b>FULL</b>		
<b>Big Darby Creek (02-200-000) EWH Existing</b>									
S.E. of Middleburg at County Road 153	V07P61 (78.44)	19.4 <sup>H</sup>	54	9.26 <sup>NS</sup>	48	68.25	<b>FULL</b>		
N.E. of North Lewisburg at North Lewisburg Rd.	V07P59 (76.54)	32.0 <sup>W</sup>	56	10.03	52/58	80.50	<b>FULL</b>		
N.W. of Milford Center at Collins Rd.	V06K03 (69.34)	71.0 <sup>W</sup>	55	9.90	VG <sup>NS</sup>	79.50	<b>FULL</b>		
At Milford Center Cemetery	V07P54 (66.10)	85.0 <sup>W</sup>	55	10.16	46	78.75	<b>FULL</b>		

Upst. Buck Run, adj. Middleburg-Plain City Rd.	V06W16 (64.38)	86.0 <sup>W</sup>	54	10.66	50	78.25	<b>FULL</b>		
S.E. of Bridgeport at State Route 38	V07S12 (62.60)	121.0 <sup>W</sup>	57	9.91	E	76.25	<b>FULL</b>		
S.E. of Unionville Center, adj. Robinson Rd.	V07P51 (58.80)	131.0 <sup>W</sup>	55	9.15 <sup>NS</sup>	E	70.00	<b>FULL</b>		
At Plain City, upst. US 42 and Ranco	V06W04 (54.10)	138.0 <sup>W</sup>	54	9.87	52	78.25	<b>FULL</b>		
S. of Plain City at Cemetery Pike	V07S09 (51.10)	157.0 <sup>W</sup>	54	9.76	44 <sup>NS</sup>	83.75	<b>FULL</b>		
Near Amity at Amity Pike	V06W08 (49.46)	193.0 <sup>W</sup>	55	9.76	E	81.50	<b>FULL</b>		
N. of West Jefferson at Hubbard Rd.	603100 (41.75)	239.0 <sup>W</sup>	57	9.87	54	85.75	<b>FULL</b>		
E. of West Jefferson at US Route 40	600830 (38.90)	247.0 <sup>W</sup>	51	9.20 <sup>NS</sup>	VG <sup>NS</sup>	87.50	<b>FULL</b>		
E. of West Jefferson, dst. Darbycrest	V06W19 (38.33)	248.0 <sup>W</sup>	55	9.67	E	87.75	<b>FULL</b>		
Near Georgesville at Alkire Rd., upst. BDC/LDC confluence	601140 (34.15)	253.0 <sup>W</sup>	59	10.74	48	93.25	<b>FULL</b>		
Upst. Darbydale dst. State Route 665	V07S06 (30.17)	448.0 <sup>B</sup>	60	11.32	50	86.25	<b>FULL</b>		
Dst. Darbydale	V07G70 (27.95)	450.0 <sup>B</sup>	55	11.21	52	86.00	<b>FULL</b>		
Upst. Gay Run, adj. Harrisburg-Georgesville Rd.	V07S04 (26.80)	454.0 <sup>B</sup>	55	10.70	E	86.00	<b>FULL</b>		
Approx. 0.5 mi. dst. Hellbranch Run and I-71	601110 (25.70)	495.0 <sup>B</sup>	54	10.41	54	82.25	<b>FULL</b>		
W. of Orient at State Route 762	V07S03 (23.75)	501.0 <sup>B</sup>	55	11.67	48	90.75	<b>FULL</b>		

Dst. PCI WWTP, upst. Snake Island	V07W56 (22.25)	503.0 <sup>B</sup>	54	11.66	48	90.25	<b>FULL</b>		
Dst. Snake Island	V07P42 (21.35)	506.0 <sup>B</sup>	56	11.79	56	88.50	<b>FULL</b>		
Ust. Scioto-Darby Rd.	V07G19 (19.8)	513	-	-	54	-	<b>FULL</b>		
S. of Orient at Darby Creek Rd.	V07P41 (19.10)	513.0 <sup>B</sup>	53	11.59	54	90.25	<b>FULL</b>		
Near Darbyville at State Route 316	601300 (13.36)	534.0 <sup>B</sup>	53	11.55	E	88.00	<b>FULL</b>		
S.E. of Darbyville at end of Darby Rd.	V07P39 (11.30)	537.0 <sup>W</sup>	58	10.74	56	85.75	<b>FULL</b>		
Ust. Westfall Aggregate	V07G17 (9.12)	544	-	-	54	-	<b>FULL</b>		
S.E. of Darbyville, dst. Westfall Aggregate	203274 (7.40)	545.0 <sup>B</sup>	52	12.44	48	88.50	<b>FULL</b>		
Near Fox at State Route 104	600970 (3.20)	552.0 <sup>B</sup>	55	12.10	54	86.25	<b>FULL</b>		
<b>Flat Branch (02-223-000)</b>		<b>MWH-C Existing</b>							
S.E. of Middleburg, dst. US Route 33	V07P60 (0.90)	12.7 <sup>H</sup>	45	N/A	44	53.75	<b>FULL</b>		
<b>Little Darby Creek (02-200-020)</b>		<b>EWH &amp; CWH Existing</b>							
(Logan Co.) At State Route 287	V06G33 (3.61)	2.9 <sup>H</sup>	53	N/A	44 <sup>NS</sup>	57.50	<b>FULL</b>		
(Logan Co.) At Cratty Rd.	V06W15 (0.34)	7.2 <sup>H</sup>	54	N/A	54	81.50	<b>FULL</b>		
<b>Spain Creek (02-222-000)</b>		<b>EWH &amp; CWH Existing</b>							
W. of North Lewisburg at Gilbert Rd	V06G31 (3.70)	6.3 <sup>H</sup>	54	N/A	58	72.25	<b>FULL</b>		

E. of North Lewisburg at mouth	V07P58 (0.01)	9.6 <sup>H</sup>	58	N/A	52	73.25	<b>PARTIAL</b>	Alterations in stream-side/littoral vegetation cover, Sedimentation/shifting bedload	Loss of riparian habitat
<b>Pleasant Run (02-221-000) EWH Existing</b>									
N.E. of Woodstock at mouth	V07P56 (0.01)	9.4 <sup>H</sup>	54	N/A	54	53.25	<b>FULL</b>		
<b>Buck Run (02-209-000) WWH Existing</b>									
At Allen Center-Pottersburg Rd.	V06G09 (10.40)	4.8 <sup>H</sup>	36 <sup>NS</sup>	N/A	G	50.50	<b>FULL</b>		
W. of Marysville at State Route 245	V06P05 (7.80)	9.0 <sup>H</sup>	42	N/A	G	60.00	<b>FULL</b>		
Near Bridgeport at mouth	V07P53 (0.01)	29.8 <sup>W</sup>	53	9.78	48	80.00	<b>FULL</b>		
<b>Robinson Run (02-207-000) WWH Existing</b>									
N. of Plain City at State Route 736 (middle crossing)	V06G08 (2.10)	9.7 <sup>H</sup>	42	N/A	G	67.75	<b>FULL</b>		
N. of Plain City at US Route 42	V06W05 (0.73)	10.5 <sup>H</sup>	50	N/A	G <sup>X-15</sup>	86.25	<b>FULL</b>		
<b>Sweeny Run (02-200-216) WWH Existing</b>									
At Plain City near mouth	V06G05 (0.2)	3.9 <sup>H</sup>	50	N/A	MG <sup>NS</sup>	57.00	<b>FULL</b>		
<b>Sugar Run (02-206-000) WWH Existing</b>									
Near Arnold at US Route 42	V06K08 (5.40)	11.4 <sup>H</sup>	34*	N/A	G	56.50	<b>PARTIAL</b>	Low/flashy flows, Sedimentation/Siltation, Nutrient Enrichment	Upstream channelization, Post-development erosion and sedimentation, Agriculture and Golf Courses

Near Plain City at Cemetery Pike	(0.43)	19.4 <sup>H</sup>	44	N/A	42	75.25	<b>FULL</b>		
<b>Worthington Ditch (02-200-015) WWH Existing</b>									
N. of Amity at Plain City-Georgesville Rd.	- (0.24)	4.6 <sup>H</sup>	50	N/A	MG <sup>NS</sup>	63.50	<b>FULL</b>		
<b>Ballenger-Jones Ditch (02-200-013) WWH Existing</b>									
At Plain City-Georgesville Rd.	V06G64 (0.18)	7.3 <sup>H</sup>	52	N/A	G	67.00	<b>FULL</b>		
<b>Fitzgerald Ditch (02-205-000) WWH Existing</b>									
At Plain City-Georgesville Rd.	V06G02 (0.55)	5.9 <sup>H</sup>	48	N/A	G	55.75	<b>FULL</b>		
<b>Little Darby Creek (02-210-000) EWH &amp; CWH Existing</b>									
Near Mechanicsburg at W. Sandusky St.	302788 (40.10)	8.2 <sup>H</sup>	54	N/A	VG <sup>NS</sup>	74.00	<b>FULL</b>		
Ust. Mechanicsburg WWTP	V06Q07 (39.30)	12.2 <sup>H</sup>	48 <sup>NS</sup>	N/A	[VG <sup>NS</sup> ]	81.00	<b>FULL</b>		
Dst. Mechanicsburg WWTP at Wing Rd.	V06S10 (38.78)	12.7 <sup>H</sup>	46 <sup>NS</sup>	N/A	48	62.00	<b>FULL</b>		
<b>Little Darby Creek (02-210-000) EWH Existing</b>									
N.E. of Mechanicsburg at Irwin Rd.	V06S05 (34.70)	26.0 <sup>W</sup>	46 <sup>NS</sup>	8.50*	50	72.00	<b>PARTIAL</b>	Direct Habitat Alterations, Sedimentation/Siltation,	Channelization
W. of Chuckery at Axe Handle Rd.	V06S04 (29.46)	70.0 <sup>W</sup>	54	9.90	E	71.00	<b>FULL</b>		
E. of Rosedale at Rosedale-Plain City Rd.	V06S03 (24.46)	78.0 <sup>W</sup>	54	9.69	42 <sup>NS</sup>	65.25	<b>FULL</b>		
N.E. of Plumwood at Bradley Rd.	V06Q01 (20.50)	98.0 <sup>W</sup>	57	9.83	54	74.00	<b>FULL</b>		

S.E. of Plumwood at Little Darby Rd. ford	V07S34 (17.25)	142.0 <sup>W</sup>	58	10.05	E <sup>X-12</sup>	86.75	<b>FULL</b>		
N.W. of West Jefferson at US Route 42	V07P67 (15.3)	147.0 <sup>W</sup>	60	10.12	E	78.25	<b>FULL</b>		
N.W. of West Jefferson at end of Snyder Lane	302704 (13.35)	149.0 <sup>W</sup>	59	10.13	44 <sup>NS</sup>	88.75	<b>FULL</b>		
Near West Jefferson at Taylor Blair Rd.	V07P65 (8.20)	161.0 <sup>W</sup>	58	9.86	46	91.00	<b>FULL</b>		
Near West Jefferson at Middle Pike	V06G28 (7.35)	162.0 <sup>W</sup>	58	10.31	50	87.00	<b>FULL</b>		
At end of Roberts Rd.	V07P64 (3.95)	170.0 <sup>W</sup>	56	10.21	52	92.50	<b>FULL</b>		
Near Georgesville at Alkire Rd.	601130 (0.07)	178.0 <sup>W</sup>	56	9.43	54	81.9	<b>FULL</b>		
<b>Clover Run (02-218-000) WWH Existing/CWH Recommended</b>									
At road to Maple Grove Cemetery	V06G27 (0.60)	1.9 <sup>H</sup>	50	N/A	E	65.00	<b>FULL</b>		
<b>Lake Run (02-216-000) EWH Confirmed</b>									
N.E. of Mechanicsburg at State Route 4	V06G25 (0.95)	5.7 <sup>H</sup>	56	N/A	E	77.00	<b>FULL</b>		
<b>Jumping Run (02-217-000) WWH Existing/EWH Recommended</b>									
N. of Mechanicsburg at State Route 559	V06G26 (0.27)	1.8 <sup>H</sup>	48 <sup>NS</sup>	N/A	VG <sup>NS</sup>	70.25	<b>FULL</b>		
<b>Treacle Creek (02-213-000) EWH Existing</b>									
N.W of Mechanicsburg at Parkview Rd	V06G18 (11.80)	6.9 <sup>H</sup>	48 <sup>NS</sup>	N/A	VG <sup>NS</sup>	71.25	<b>FULL</b>		
N.E. of Mechanicsburg at State Route 161	V06G20 (6.00)	12.9 <sup>H</sup>	54	N/A	56	62.50	<b>FULL</b>		

Upst. Winget Rd. covered bridge	V06S11 (0.78)	36.0 <sup>W</sup>	45*	8.55*	26*	40.50	<b>NON</b>	Sedimentation/Siltation, Direct Habitat Alterations, Organic Enrichment	Unrestricted livestock access, Channelization, Loss of riparian habitat, Grain Spill
<b>Proctor Run (02-214-000) EWH Existing</b>									
S.W. of Woodstock at Park Rd.	V06G23 (4.90)	8.8 <sup>H</sup>	48 <sup>NS</sup>	N/A	VG <sup>NS</sup>	64.00	<b>FULL</b>		
S.E. of Woodstock at mouth	V07P56 (0.01)	9.9 <sup>H</sup>	56	N/A	E	76.50	<b>FULL</b>		
<b>Barron Creek (02-212-000) WWH Existing</b>									
E. of Rosedale at State Route 38	V06G17 (0.20)	8.2 <sup>H</sup>	48	N/A	G	65.25	<b>FULL</b>		
<b>Wamp Ditch (02-210-001) WWH Existing</b>									
S. of Chuckery at Finley Guy Rd.	V06Q08 (0.10)	5.5 <sup>H</sup>	50	N/A	F*	54.50	<b>PARTIAL</b>	Sedimentation/Siltation, Nutrient Enrichment Direct habitat alteration	Channelization, Agriculture, Loss of riparian habitat
<b>Spring Fork (02-211-000) EWH Existing</b>									
S. of Mechanicsburg at Wren Rd	V06G13 (15.90)	4.8 <sup>H</sup>	56	N/A	VG <sup>NS</sup>	75.00	<b>FULL</b>		
S.W. of Rosedale at Guy Cemetery Rd.	V06G15 (10.08)	15.0 <sup>H</sup>	56	N/A	G*	57.50	<b>PARTIAL</b>	Sedimentation/siltation Direct Habitat Alteration	Recent upstream channelization, Loss of riparian habitat
S.E. of Rosedale at Rosedale- Milford Center Rd	V06Q10 (7.8)	19.5 <sup>H</sup>	54	N/A	58	57.75	<b>FULL</b>		
Near mouth at Lafayette-Plain City Rd.	V07S36 (0.75)	37.5 <sup>W</sup>	-	-	(E)	-	-		
<b>Smith Ditch (02-200-009) EWH Existing</b>									
N.W. of Darbydale at Biggert Rd.	V07K18 (0.20)	7.8 <sup>H</sup>	52	N/A	G*	77.00	<b>PARTIAL</b>	Natural Conditions (Flow or Habitat)	Natural Sources

<b>Hellbranch Run (02-204-000) WWH Existing</b>									
N.W. of Galloway, approx. 0.6 mi. dst. Alton Rd	203243 (9.40)	23.1 <sup>W</sup>	38 <sup>NS</sup>	8.17 <sup>NS</sup>	46	70.00	<b>FULL</b>		
S. of Galloway at Kunz Rd.	V07S50 (7.29)	27.8 <sup>W</sup>	47	7.88 <sup>NS</sup>	44	72.75	<b>FULL</b>		
Dst. Oakhurst Knolls WWTP	V07G01 (5.8)	32.0 <sup>W</sup>	52	9.30	48	91.50	<b>FULL</b>		
<b>Hellbranch Run (02-204-000) EWH Existing</b>									
N. of Harrisburg at Lambert Rd.	V07P11 (0.98)	37.4 <sup>W</sup>	[56]	[9.88]	44 <sup>NS</sup>	[75.5]	<b>FULL</b>		
Dst. Timberlake WWTP	V07S47 (0.90)	37.4 <sup>W</sup>	[56]	[9.50]	44 <sup>NS</sup>	[77.25]	<b>FULL</b>		
<b>Hamilton Run (02-204-002) MWH-C Existing</b>									
S. of Hilliard at Walker Rd.	V07G06 (3.40)	3.6 <sup>H</sup>	26	N/A	F	43.50	<b>FULL</b>		
<b>Hamilton Run (02-204-002) WWH Existing</b>									
Near Alton, upst. McCoy Ditch	203345 (0.80)	6.6 <sup>H</sup>	<u>24*</u>	N/A	MS <sup>NS</sup>	47.50	<b>NON</b>	Direct Habitat Alteration, Sedimentation/Siltation	Channelization
Near Alton at US Route 40	V07P15 (0.41)	9.7 <sup>H</sup>	<u>22*</u>	N/A	MG <sup>NS</sup>	58.25	<b>NON</b>	Direct Habitat Alteration, Sedimentation/Siltation	Channelization
<b>McCoy Run (02-204-003) Undesignated/WWH Recommended</b>									
Near Alton at mouth	203348 (0.01)	3.1 <sup>H</sup>	<u>26*</u>	N/A	MG <sup>NS</sup>	44.00	<b>NON</b>	Direct Habitat Alteration, Sedimentation/Siltation	Channelization
<b>Clover Groff Run (02-204-001) MWH-C Existing</b>									
At park adj. Frazell Rd.	203358 (5.00)	4.6 <sup>H</sup>	34	N/A	F	39.00	<b>FULL</b>		
At Timberbrook WTP near Hickory Hill Dr.	300738 (3.60)	5.7 <sup>H</sup>	34	N/A	MG	56.50	<b>FULL</b>		

<b>Clover Groff Run (02-204-001)</b>		<b>WWH Existing</b>							
Near Alton at Alton Rd.	V07P14 (0.14)	9.9 <sup>H</sup>	<u>26*</u>	N/A	MG <sup>NS</sup>	47.25	<b>NON</b>	Direct Habitat Alteration, Sedimentation/Siltation, Modified/flashy flow regime	Channelization, Urban runoff
<b>Springwater Run (02-203-000)</b>		<b>WWH Existing/CWH Recommended</b>							
At Harrisburg-Georgesville Rd.	203267 (0.80)	3.4 <sup>H</sup>	48	N/A	[MG <sup>NS</sup> ]	50.25	<b>FULL</b>		
<b>Trib. to Big Darby Creek (23.61) (02-200-024)</b>		<b>Undesignated/CWH Recommended</b>							
S. of Harrisburg at mouth	203269 (0.10)	0.60 <sup>H</sup>	48	N/A	G	44.75	<b>FULL</b>		

<b>Biological Criteria Eastern Corn Belt Plains</b>			
<b>Index – Site Type</b>	<b>EWB</b>	<b>WWH</b>	<b>MWH</b>
<b>IBI – Headwaters</b>	50	40	24
<b>IBI – Wading</b>	50	40	24
<b>IBI – Boat</b>	48	42	24
<b>MIwb – Wading</b>	9.4	8.3	6.2
<b>MIwb – Boat</b>	9.6	8.5	5.8
<b>ICI</b>	46	36	22

- a - River Mile (RM) represents the Point of Record (POR) for the station, not the actual sampling RM.
- b - MIwb is not applicable to headwater streams with drainage areas  $\leq 20$  mi<sup>2</sup>.
- c - A narrative evaluation of the qualitative sample based on attributes such as EPT taxa richness, number of sensitive taxa, and community composition was used when quantitative data was not available or considered unreliable. VP=Very Poor, P=Poor, LF=Low Fair, F=Fair, MG=Marginally Good, G=Good, VG=Very Good, E=Exceptional
- d - Attainment is given for the proposed status when a change is recommended.
- ns - Nonsignificant departure from biocriteria ( $\leq 4$  IBI or ICI units, or  $\leq 0.5$  MIwb units).
- \* - Indicates significant departure from applicable biocriteria ( $> 4$  IBI or ICI units, or  $> 0.5$  MIwb units). Underlined scores are in the Poor or Very Poor range and would automatically place a site into non-attainment.
- B - Boat site.
- H - Headwater site.
- W - Wading site.
- <sup>x-15</sup> - Flow over artificial substrate less than 0.3 feet per second required for valid sample; narrative evaluation overrides ICI.
- <sup>x-12</sup> - Suspected high water influence; narrative evaluation overrides ICI.

Biological scores denoted by [brackets] were collected during the 2015 sampling index period.

**QHEI Attributes: Big Darby Creek Basin 2014 TMDL**

Key QHEI Components		WWH Attributes					MWH Attributes										
							High Influence		Moderate Influence								
River Mile	QHEI	Gradient (ft/mi)	Low/Normal Riffle Embedderness	Max Depth > 40cm	Low/Normal Embedderness	Fast Current/Eddies	Extensive/Moderate Cover	Moderate/High Sinuosity	Good/Excellent Development	Silt Free Substrates	Boulder/Cobble/Gravel Substrates Not Channelized or Recovered	High Influence Modified Attributes	Moderate Influence	M.L. Modified Attributes	MWH M.L./MWH Ratio	MWH H.L. + 1/MWH + 1 Ratio	
02-200-000																	
Year:	2014																
83.2	77.3	71.43	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	9				X	1 0.10 0.30	
81.9	58.0	16.95	X X		X						3	X X X			X X X	8 1.25 2.25	
81.6	57.3	17.24	X X		X	X X					5	X	1	X X	X X X X	7 0.50 1.50	
81.1	67.5	19.61	X X		X X						5	X	1	X X	X X	X X X	7 0.50 1.33
80.8	71.5	19.61	X X	X X X X	X						7		0	X	X X	X X	5 0.13 0.75
79.2	55.3	12.20	X X		X X						5	X	1	X X	X	X X X X	7 0.50 1.33
78.3	68.3	12.50	X X	X	X X X X X						8	X	1	X	X X	X X	6 0.33 0.78
76.4	80.5	6.94	X X	X X X X X X X X							9		0			X	1 0.10 0.20
69.5	79.5	5.92	X X	X X X	X X X						8		0			X	1 0.11 0.22
66.1	78.8	4.35	X X	X X X X X X							8		0			X	1 0.11 0.22
64.4	78.3	4.35	X X	X X X X X X							8		0			X	1 0.11 0.22
62.5	76.3	3.80	X X	X X X	X X						7	X	1		X X	X X	4 0.25 0.63
58.8	70.0	3.06	X	X X	X X X						6		0	X	X X	X X X	6 0.29 1.14
54.2	78.3	4.76	X X	X X X	X X						7		0	X	X	X X X	5 0.13 0.75
51.3	83.8	12.05	X X	X X X X X X X X							9		0		X	X X	3 0.10 0.40
49.2	81.5	4.69	X X	X X X X	X						7	X	1		X	X X	3 0.25 0.50
41.6	85.8	5.32	X X	X X X X	X						7		0		X	X X	3 0.13 0.63
38.9	87.5	3.97	X X	X X X X X X X X							9		0			X	1 0.10 0.30
38.3	87.8	3.97	X X	X X X X X X X X							9		0				0 0.10 0.20
34.2	93.3	4.48	X X	X X X X X X X X							9		0				0 0.10 0.20
29.9	86.3	4.52	X X	X X X X X X X X							9		0				0 0.10 0.20
28.2	86.0	4.52	X X	X X X X X X X X							9		0			X	1 0.10 0.30
26.4	86.0	5.85	X X	X X X X X X X X							9	X	1				0 0.20 0.20
25.8	82.3	7.87	X X	X X X X X X X X							9		0			X	1 0.10 0.30
23.8	90.8	6.71	X X	X X X X X X X X							8		0			X	1 0.11 0.33
22.5	90.3	4.10	X X	X X X X X X X X							8		0			X	1 0.11 0.33
21.3	88.5	4.10	X X	X X X X X X X X							9		0			X	1 0.10 0.30
18.7	90.3	4.74	X X	X X X X X X X X							9		0				0 0.10 0.20
13.2	88.0	4.37	X X	X X X X X X X X							9		0				0 0.10 0.20
11.3	85.8	4.15	X X	X X X X X X X X							8		0			X	2 0.11 0.44
7.4	88.5	3.29	X X	X X X X X X X X							9		0				0 0.10 0.20

Report Date: 11/09/2015







**QHEI Attributes: Big Darby Creek Basin 2014 TMDL**

Key QHEI Components	WWH Attributes			MWH Attributes																
	River Mile	QHEI	Gradient (ft/mi)	High Influence					Moderate Influence					MWH M.L./MWH Ratio	MWH H.L. + 1/MWH + 1 Ratio					
				Low/Normal Riffle Embeddiness Max Depth > 40cm Low/Normal Embeddiness 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	Sparsely 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
	<b>02-212-000</b>																			
	<b>Year: 2014</b>																			
	0.2	65.3	14.29	X X	X X	X	5			0	X	X X	X X X	6	0.17	1.33				
	<b>02-213-000</b>																			
	<b>Year: 2014</b>																			
	11.8	71.3	15.63	X X	X X X	X X	7			0	X	X X	X X	5	0.13	0.75				
	6.0	62.5	16.13	X X	X X X	X X	7			0	X	X	X X X	5	0.25	0.88				
	0.8	40.5	3.45		X	X	2	X	X	2	X X	X X X	X X X	8	1.33	3.33				
	<b>02-214-000</b>																			
	<b>Year: 2014</b>																			
	4.9	64.0	41.67	X X	X X X X X X X		9			0	X X	X X	X	5	0.20	0.70				
	1.6	76.5	12.35	X	X X X X X X X		8			0	X X	X X X	X X	7	0.22	1.00				
	<b>02-216-000</b>																			
	<b>Year: 2014</b>																			
	1.0	77.0	16.39	X X	X X X	X X X	8			0			X X	2	0.11	0.33				
	<b>02-217-000</b>																			
	<b>Year: 2014</b>																			
	0.3	70.3	16.67	X X	X X X	X	6			0	X	X	X X X	5	0.14	1.00				
	<b>02-218-000</b>																			
	<b>Year: 2014</b>																			
	0.6	65.0	47.62	X X	X X X	X X X	8		X	1	X	X	X	3	0.22	0.56				
	<b>02-221-000</b>																			
	<b>Year: 2014</b>																			
	0.5	53.3	14.30	X		X	2		X X	2	X	X X	X X	5	1.33	2.33				
	<b>02-222-000</b>																			
	<b>Year: 2014</b>																			
	3.7	72.3	21.74	X X	X X X	X	6			0		X	X X X	4	0.14	0.71				
	0.0	73.3	11.36	X X	X X X	X X	7			0	X	X	X X X	5	0.13	0.88				

Report Date: 11/09/2015

