

Swan Creek Watershed

Volume 1

- Background & Water Quality Data for the Swan Creek Watershed
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The Swan Creek Watershed is comprised of Hydrologic Units 04100009 070 and 04100009 080. The drainage area of Swan Creek is 203.9 square miles. Its headwaters rise in Henry, Fulton and western Lucas counties. Over 200 miles of creeks and ditches drain this watershed. Swan Creek itself is only about 40 miles long.¹ Swan Creek’s gradient is similar to the Maumee River with a drop of 2.1 feet per mile. Swan Creek is the only major tributary to the Maumee River that is located within the Maumee AOC. The major streams that feed Swan Creek are Ai Creek, Blue Creek, and Blystone Ditch.

The majority of the Swan Creek watershed is located within the Maumee Area of Concern. Due to water pollution problems and the physical characteristics of Swan Creek, contact and non-contact recreational use of Swan Creek is uncommon.

The Swan Creek watershed can be divided into three major reaches based on the dominant stream characteristics within each reach. In the upstream reach from river mile 19 in Monclova Township to the headwaters the channel is stable. The banks are low with indistinct valleys and floodplains. This reach is primarily in agricultural use. The upper reach of Swan Creek has important aesthetic value as it flows through the Oak Openings Preserve Metropark in western Lucas County.

**Upper Reach of
Swan Creek Watershed Use Attainment Data²**

River Mile	Sample Year	ICI Score	HELP Ecoregion ICI Criteria	Lacustrary ICI Score*	HELP Ecoregion Lacustrary ICI Criteria*	Modified Index of Well Being Score	HELP Ecoregion Miwb Criteria	IBI Score	HELP Ecoregion IBI Criteria	Lacustrary IBI Score*	HELP Ecoregion Lacustrary IBI Criteria*	QHEI Score	HELP Ecoregion QHEI Criteria
<i>Swan Creek</i>													
21.6	1985					4.348	7.3	30	32				
21.6	1993					6.76	7.3	36	32			47	60
22.1	1992					6.906	7.3	28	32			50.5	60
24.7	1989					6.412	7.3	30	32				
24.7	1989					5.902	7.3	32	32				
28.6	1989					4.118	7.3	24	32				
28.6	1989					4.653	7.3	30	32				
31.7	1989					4.967	7.3	30	32				
31.7	1989					5.342	7.3	32	32				
33.7	1989					6.469	7.3	26	32				
33.7	1989					5.84	7.3	24	32				
<i>Blue Creek</i>													
0.7	1985					3.735	7.3	20	32				
0.7	1992					7.151	7.3	38	32			54	60
0.7	1993					7.791	7.3	30	32			46	60
1.6	1985					4.928	7.3	28	32				
1.6	1993											21.5	60

**Upper Reach of
Swan Creek Watershed DELT Data³**

River Mile	Sample Year	Percent DELT Anomalies	Percent Deformities	Percent Eroded Fins	Percent Lesions	Percent Tumors	Relative Number of Fish Collected	Relative Number of Species Collected	Relative Number of Fish Minus Tolerants	Relative Weight of Fish Collected (in grams)
<i>Swan Creek</i>										
21.6	1985	0	0	0	0	0	284	17	148	0
21.6	1993	1.677	0.25	0.92	0.5	0	841.96	19	476.6	59.736
22.1	1992	0.93	0	0.46	0.46	0	427.55	16	181.91	19.059
24.7	1989	2.1053	0	1.05	1.05	0	142.5	15	64.5	5.199
24.7	1989	1.1628	0	0	1.16	0	129	11	69	3.598
28.6	1989	1.8862	0	1.89	0	0	75.76	8	38.6	10.295
28.6	1989	0	0	0	0	0	58.6	7	31.45	2.399
31.7	1989	0	0	0	0	0	214	10	86.01	5.51
31.7	1989	0.9434	0	0	0.94	0	212	9	122.01	4.668
33.7	1989	0	0	0	0	0	492	12	188.98	7.086
33.7	1989	0	0	0	0	0	633	11	170.97	16.145
<i>Blue Creek</i>										
0.7	1985	0	0	0	0	0	286	11	70.01	0
0.7	1992	2.0099	0	1	1	0	351.27	14	203	5.013
0.7	1993	0.7997	0.26	0.54	0	0	723.78	16	346.9	7.467
1.6	1985	0	0	0	0	0	972	15	474.04	0

The middle reach is the area that lies between river miles 19 and 6, where the creek is actively eroding its channel. The banks are high (35 to 45 feet or more) and unstable and are intermixed with detached floodplains. Bedrock in the channel at river mile 19 prevents the extension of this erosion upstream. The land use in the middle reach is primarily residential and is one of the fastest developing areas in Northwest Ohio. Land areas included are Monclova and Springfield townships in Lucas County and the western edge of the City of Toledo. Tributaries to Swan Creek that have extensive floodplain lands are Wolf Creek, Blystone Ditch, Stone Ditch, Cairl Creek, Drennan Ditch and Heilman Ditch.

The Swan Creek Preserve Metropark is located in the middle reach within the western portion of the City of Toledo. This is a developed urban area that is still exhibiting some residential and commercial growth. Swan Creek flows through this park and is its primary natural feature. The park is an important resource for the area not only because of its location, but also because it is probably the best example of flood plain habitat in the region.

The major problems of the middle reach are urbanization with the filling in of the floodplains and destruction of wetland areas. The water quality is *fair* but does not meet the goals of the Clean Water Act. The cause of quality impairment is ill-functioning septic tank systems, storm runoff, agricultural runoff, and the erosive forces of the stream itself.

**Middle Reach of
Swan Creek Watershed Use Attainment Data⁴**

River Mile	Sample Year	ICI Score	HELP Ecoregion ICI Criteria	Lacustuary ICI Score*	HELP Ecoregion Lacustuary ICI Criteria*	Modified Index of Well Being Score	HELP Ecoregion Miwb Criteria	IBI Score	HELP Ecoregion IBI Criteria	Lacustuary IBI Score*	HELP Ecoregion Lacustuary IBI Criteria*	QHEI Score	HELP Ecoregion QHEI Criteria
<i>Swan Creek</i>													
10.2	1986	26	34			5.604	7.3	24	32				
10.2	1986					4.151	7.3	24	32				
10.2	1986					6.898	7.3	28	32				
10.2	1992	30	34										
10.4	1992					4.403	7.3	24	32			62	60
13.8	1993					5.952	7.3	30	32			40	60
15.3	1993					7.034	7.3	38	32			53.5	60
18.5	1989					6.329	7.3	34	32				
18.5	1989					6.53	7.3	36	32				
18.5	1993					6.655	7.3	40	32			63	60
<i>Cairl Creek</i>													
0.5	1993											51	60
<i>Wolf Creek</i>													
0.5	1992	14	34			5.266	7.3	18	32			68	60
0.5	1993					4.781	7.3	20	32			49.5	60
2	1993											38	60

**Middle Reach of
Swan Creek Watershed DELT Data⁵**

River Mile	Sample Year	Percent DELT Anomalies	Percent Deformities	Percent Eroded Fins	Percent Lesions	Percent Tumors	Relative Number of Fish Collected	Relative Number of Species Collected	Relative Number of Fish Minus Tolerants	Relative Weight of Fish Collected (in grams)
<i>Swan Creek</i>										
10.2	1986	1.4085	0	0	1.41	0	213	13	70.5	12.772
10.2	1986	0	0	0	0	0	69.6	11	25.8	10.221
10.2	1986	1.5385	0	0	1.54	0	97.5	12	58.5	9.972
10.4	1992	2.27	0.76	1.52	0	0	152.3	18	48.45	38.704
13.8	1993	7.3169	0	6.1	1.22	0	111.85	10	80.48	7.358
15.3	1993	0	0	0	0	0	123	16	97.5	8.133
18.5	1989	0.6211	0	0.62	0	0	241.5	14	137.99	4.888
18.5	1989	4.2553	0	1.06	2.13	0	141	12	94.5	4.696
18.5	1993	1.2893	0	1.29	0	0	589.5	13	477	3.831
<i>Wolf Creek</i>										
0.5	1992	1.59	1.2	0.39	0	0	426.75	12	56.68	16.058
0.5	1993	2.06	0	1.65	0.41	0	347.26	11	27.16	6.424

The lower reach, from river mile 6 to the mouth in downtown Toledo, is actively silting in its channel. The banks are as high as 35 to 45 feet and are intermixed with floodplain areas. This lower reach is under the seiche effect from the Maumee River and Lake Erie. The level of Lake Erie prevents the lower reach from naturally deepening itself. The major problem is extremely poor water quality, due to storm runoff, hydromodification, and urban development.

The lower reach is highly urbanized with little vacant land left to build upon. The land use is residential, commercial, and industrial. Within this reach are two major open space areas. The first is Highland Park between South Avenue and the creek (RM 4.0), with the second being Sterling Field. This playing field is within an ox bow in the creek and lies between two major streets, Hawley and Collingwood (RM 1.5-2.5).

This lower reach is neither swimmable nor fishable according to public health standards. From the area of the Swan Creek Preserve Metropark (RM 7.25-10.5) to the mouth, the Toledo Department of Health has posted warnings for no body contact. Contributing to the pollution are the combined sewer overflows, industrial discharges to the sanitary sewer system, storm sewers, and urban storm water runoff. All of this can and does reach the creek, degrading water quality.

Fish tissue sampling conducted on carp taken at St. Clair Street in 1986 showed 5.9 parts per million (ppm) of PCBs from the body composite. The U.S. Food and Drug Administration Health Standards for PCBs in fish is 2.0 ppm for the edible portion. Polychlorinated biphenyls (PCBs) are highly stable man-made organic substances and are acutely toxic to organisms. PCBs are banned today as they are carcinogenic.

From Champion Street (RM 3.9) to the mouth the water quality is rated as *poor*. Heavy metals have the largest impact between Hawley Street (RM 2.6) to Collingwood Boulevard (RM 1.2) with zinc, lead, arsenic, nickel, and chromium found in the water and the bottom sediments. Fish in this lower reach, especially the bottom feeders such as catfish and carp, were found to have external abnormalities such as lesions, eroded fins, blackspots and other deformities. The worst area is near Collingwood Boulevard where creosote was found in the sediments at Hawley Street.

**Lower Reach of
Swan Creek Watershed Use Attainment Data⁶**

River Mile	Sample Year	ICI Score	HELP Ecoregion ICI Criteria	Lacustrary ICI Score*	HELP Ecoregion Lacustrary ICI Criteria*	Modified Index of Well Being Score	HELP Ecoregion Miwb Criteria	IBI Score	HELP Ecoregion IBI Criteria	Lacustrary IBI Score*	HELP Ecoregion Lacustrary IBI Criteria*	QHEI Score	HELP Ecoregion QHEI Criteria
<i>Swan Creek</i>													
0.4	1993											24	60
0.5	1986					6.669	7.3			19	42		
0.5	1986					7.066	7.3			23	42		
0.5	1986					3.369	7.3			20	42		
0.5	1992					7.968	7.3			32	42	43.5	60
0.6	1986			16	42								
0.6	1992			22	42								
1.2	1986			22	42								
1.2	1986					4.417	7.3			6	42		
1.2	1986					3.196	7.3			13	42		

River Mile	Sample Year	ICI Score	HELP Ecoregion ICI Criteria	Lacustrary ICI Score*	HELP Ecoregion Lacustrary ICI Criteria*	Modified Index of Well Being Score	HELP Ecoregion Miwb Criteria	IBI Score	HELP Ecoregion IBI Criteria	Lacustrary IBI Score*	HELP Ecoregion Lacustrary IBI Criteria*	QHEI Score	HELP Ecoregion QHEI Criteria
<i>Swan Creek</i>													
2.5	1992											55	60
2.5	1992					7.254	7.3			30	42		
2.6	1986			16	42	5.238	7.3			11	42		
2.6	1986									7	42		
2.6	1986					3.506	7.3			8	42		
2.6	1992			28	42								
2.6	1993											26.5	60
3.9	1986	4	34			4.263	7.3	16	32				
3.9	1986					4.496	7.3	14	32				
3.9	1986					5.009	7.3	16	32				
4.2	1992	22	34			7.576	7.3	36	32				
4.2	1993											29.5	60
4.4	1986					5.315	7.3	24	32				
4.4	1986					5.204	7.3	24	32				
4.4	1986					5.883	7.3	26	32				
4.9	1986	18	34										

* The double horizontal line represents the lacustrary divide of Swan Creek, although it is noted that lacustrary lengths are approximate and fluctuate with lake levels and wind direction.⁷

Lower Reach of Swan Creek Watershed DELT Data⁸

River Mile	Sample Year	Percent DELT Anomalies	Percent Deformities	Percent Eroded Fins	Percent Lesions	Percent Tumors	Relative Number of Fish Collected	Relative Number of Species Collected	Relative Number of Fish Minus Tolerants	Relative Weight of Fish Collected (in grams)
<i>Swan Creek</i>										
0.5	1986	6.98	0	0	6.98	0	86	10	82	22.896
0.5	1986	0	0	0	0	0	228	11	202	40.526
0.5	1986	0	0	0	0	0	192	3	186	8.62
0.5	1992	2.44	0	1.22	1.22	0	328	15	260	34.22
1.2	1986	20	0	0	20	0	40	2	26	21.216
1.2	1986	0	0	0	0	0	0	0	0	0
1.2	1986	0	0	0	0	0	90	3	68	27.139
2.5	1992	0	0	0	0	0	130	14	80	38.69
2.6	1986	3.85	0	0	3.85	0	52	7	22	32.262
2.6	1986	0	0	0	0	0	2	0	0	1.32
2.6	1986	2.5	0	2.5	0	0	80	3	58	16.708
3.9	1986	6.8966	3.45	0	3.45	0	58	7	20	14.432
3.9	1986	9.2157	0	0	9.22	0	68	8	22	3.917
3.9	1986	3.1624	0	3.16	0	0	156	9	90	6.032
4.2	1992	0.6	0	0.6	0	0	296.57	15	195.94	3.521

River Mile	Sample Year	Percent DELT Anomalies	Percent Deformities	Percent Eroded Fins	Percent Lesions	Percent Tumors	Relative Number of Fish Collected	Relative Number of Species Collected	Relative Number of Fish Minus Tolerants	Relative Weight of Fish Collected (in grams)
<i>Swan Creek</i>										
4.4	1986	2.5532	0	1.28	1.28	0	174.09	12	57.41	89.961
4.4	1986	3.2468	1.59	1.66	0	0	126	9	40	31.579
4.4	1986	3.0769	3.08	0	0	0	130	10	68	31.836

* The double horizontal line represents the lacustuary divide of Swan Creek, although it is noted that lacustuary lengths are approximate and fluctuate with lake levels and wind direction.⁹

Swan Creek Watershed Impairments Causes and Sources of Impairments¹⁰

Segment	Miles Assessed & Aquatic Life Use Designation [#]	Causes of Impairment*	Sources of Impairment*	Comments
Swan Creek (Headwaters to Ai Crk)	12.90	Siltation-H	Agriculture-H	305(b)-1996: Data in this table
Swan Creek (Ai to Blue Creek)	8.4 (RM 22.17-30.57) WWH	Siltation-H	Nonirrigated crop production-H	305(b)-2000: no comments
Swan Creek (Blue Creek to Maumee River)	22.17 (RM 0-22.17) WWH	Siltation-H Metals-M Other habitat alterations-M Pesticides-M Priority organics-M	Other urban runoff-H Channelization-M Land development/ Suburbanization-M	305(b)-2000: Swan Creek has potential if certain problems can be overcome including polluted urban runoff, removal of trash, reducing silt inputs and restoring habitat; PCBs and pesticides are a problem in fish tissue.
Heilman Ditch	3.81 (RM 0-3.81) LRW	Other habitat alterations-H Flow alteration-M Unknown toxicity-M	Other urban runoff-H Highway maintenance and runoff-M	305(b)-2000: stream habitat was good, but not many fish; highly variable flow and impacts from urban NPS probably keep this stream from performing higher.
Wolf Creek	7.0 (RM 0-7.0) WWH	Total toxics-H Siltation-M Flow alteration-S Other habitat alterations-S	Other urban runoff-H Land development/ Suburbanization-M Highway/road/bridge/ sewer line-S Streambank modification/ Destabilization-S	305(b)-2000: habitat and riparian cover were good; fish and macroinvertebrate communities were poor; appears to be a problem with the urbanized nature of the watershed (i.e. toxic inputs, variable flow, etc.)
Blue Creek	11.9 (RM 0-11.9) WWH	Other habitat alterations-H Flow alteration-M Siltation-M Pesticides-S Metals-S Priority organics-S Other habitat alterations-T	Land development/ Suburbanization-M Other urban runoff-H Removal of riparian Vegetation-M Streambank modification/ Destabilization-M	305(b)-2000: stream seems to be on borderline of supporting attainment; fish are slightly contaminated with PCBs, pesticides and metals; probably a whole stream problem, only documented in lower reaches.

*Magnitude of that cause or source of impairment: H=high, M=moderate, S=slight, T=identifies a threat

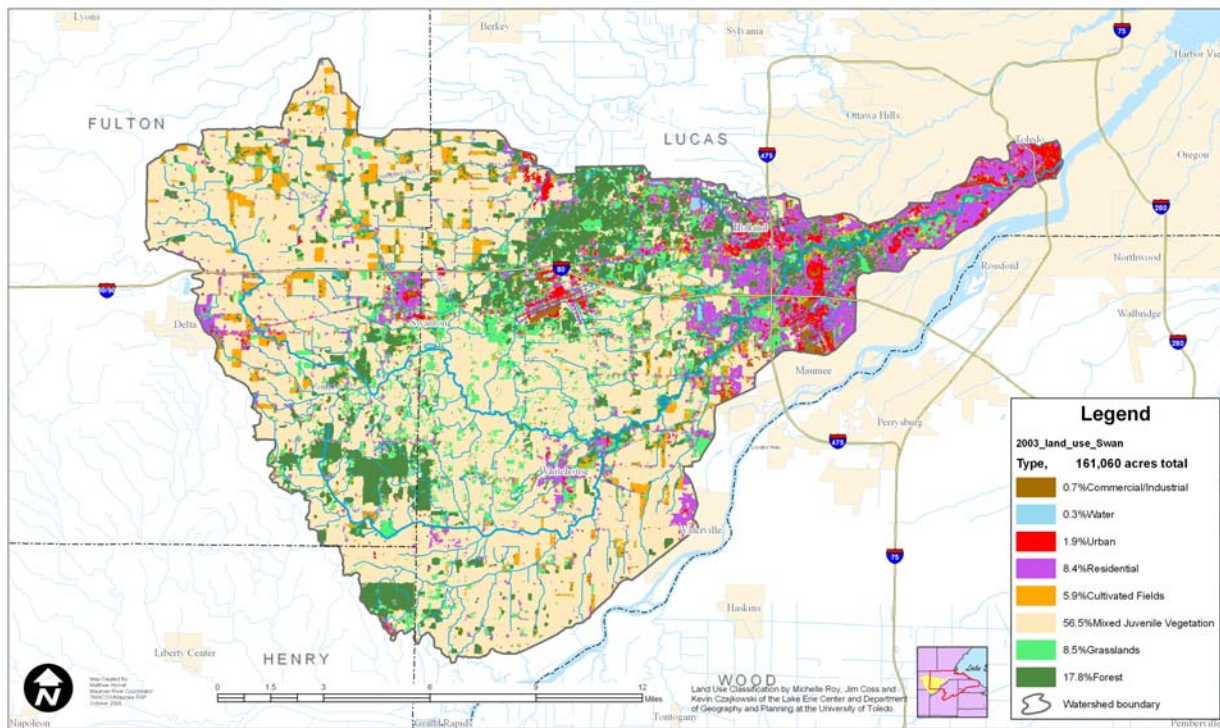
[#]Aquatic Life Use Designation: WWH=Warm Water Habitat, MWH=Modified Warm Water Habitat, LRW=Limited Resource Water

Land Use of the Swan Creek Watershed

In 2003 land use classifications produced by The University of Toledo for the Swan Creek watershed showed 57 percent of the land used by mixed juvenile vegetation. This vegetation type can be row crops in an early stage of growth, tracts of open space or yards. Forest and grassland account for 18 percent and 9 percent respectively, and 6 percent is in cultivated fields.

Approximately 8 percent of the watershed has been developed for residential use, 2 percent for urban uses, and less than 1 percent for commercial/industrial uses.

2003 Land Use in the Swan Creek Watershed



Status of Beneficial Use Impairments

When the Maumee Area of Concern was defined in the late 1980s, the Maumee RAP Public Advisory Council determined which beneficial uses were impaired based on the entire AOC. This was done because the only way of delisting an AOC was a comprehensive one; all listed or all delisted. Now that there are alternative methods for incrementally delisting an AOC by watershed or impairment, the Maumee RAP needed to determine the BUIs by watershed. This was done using data and resources that were available before 1990. The two tables below summarize the BUIs impacting the Swan Creek Watershed in 1990 and 2004.

Following the BUI Summary Tables are maps of this watershed, including the jurisdictions, 14-digit HUCs, and custom-digitized river mile maps made specifically for the Maumee AOC watersheds.

The heart of this plan, the Watershed Project Tables (WPTs), is found in Volume 2. As explained in the Introduction, the WPTs are the living portion of the report that will change and grow, as projects are implemented and goals are attained. These tables have been organized by Causes and Sources and include Projects, Potential Project Partners, Funding Sources, Timeline, Status, Performance/Environmental Measures, HUC/Stream Segment Addressed, and indicate the Beneficial Use Impairment (BUI) that could be effected by the project. Also incorporated into the table (where

applicable) is a reference to the ODNR Coastal Management Measures that may benefit from the implementation of an identified project.

There are differing levels of detail in the WPTs, often depending on how soon a project will be implemented, what source will be funding it, or by the amount of data available for that watershed. The status of projects in the WPTs has been organized and color-coded as follows: **In Progress**, **Planning**, **Concept**, **Ongoing**, and **Complete**.

**Beneficial Use Impairments In 1990
for the Swan Creek/Blue Creek Watershed**

(as determined in 2002)

Beneficial Use Impairments	Swan Cr./Blue Cr.	Ai Creek	Reasons/Data Source
BUI 1: Restriction on fish and wildlife consumption			
BUI 2: Tainting of fish & wildlife flavor			
BUI 3: Degradation on fish and wildlife populations			
BUI 4: Fish tumors or other deformities			
BUI 5: Bird or animal deformities or reproductive problems			
BUI 6: Degradation of benthos			
BUI 7: Restriction on dredging activities			
BUI 8: Eutrophication or undesirable algae			
BUI 9: Restrictions on drinking water consumption, or taste and odor			
BUI 10: Beach closings			
BUI 11: Degradation of aesthetics			
BUI 12: Added cost to agriculture and industry			
BUI 13: Degradation of phytoplankton & zooplankton populations			
BUI 14: Loss of fish and wildlife habitat			

Possible answers – Impaired, Not Impaired, Unknown, Not Applicable

**Beneficial Use Impairments In 2005
for the Swan Creek/Blue Creek Watershed**

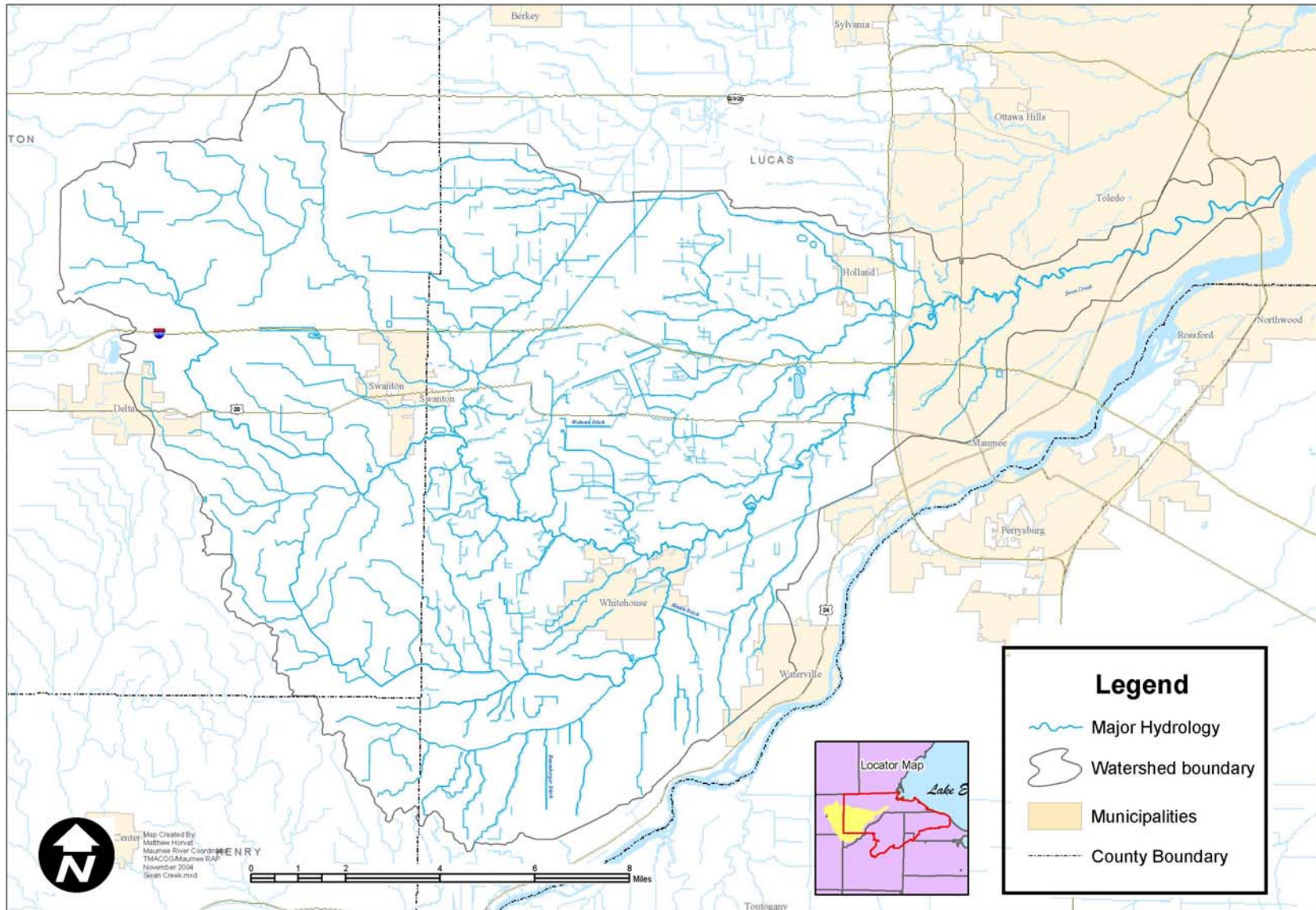
(last updated 11/7/05)

Beneficial Use Impairments	Swan Cr./Blue Cr.	Ai Creek	Reasons/Data Source
BUI 1: Restriction on fish and wildlife consumption	Not impaired		
BUI 2: Tainting of fish & wildlife flavor	Not impaired		
BUI 3: Degradation on fish and wildlife populations	Impaired		
BUI 4: Fish tumors or other deformities	Impaired		
BUI 5: Bird or animal deformities or reproductive problems	Unknown		
BUI 6: Degradation of benthos	Impaired		
BUI 7: Restriction on dredging activities	Not impaired		
BUI 8: Eutrophication or undesirable algae	Unknown		
BUI 9: Restrictions on drinking water consumption, or taste and odor	Not impaired		Public drinking water system in Metamora draws from a trib of Ten Mile Creek
BUI 10: Beach closings	Impaired		
BUI 11: Degradation of aesthetics	Impaired		
BUI 12: Added cost to agriculture and industry	Not impaired		
BUI 13: Degradation of phytoplankton & zooplankton populations	Not applicable		
BUI 14: Loss of fish and wildlife habitat	Impaired		

Possible answers – Impaired, Not Impaired, Unknown, Not Applicable

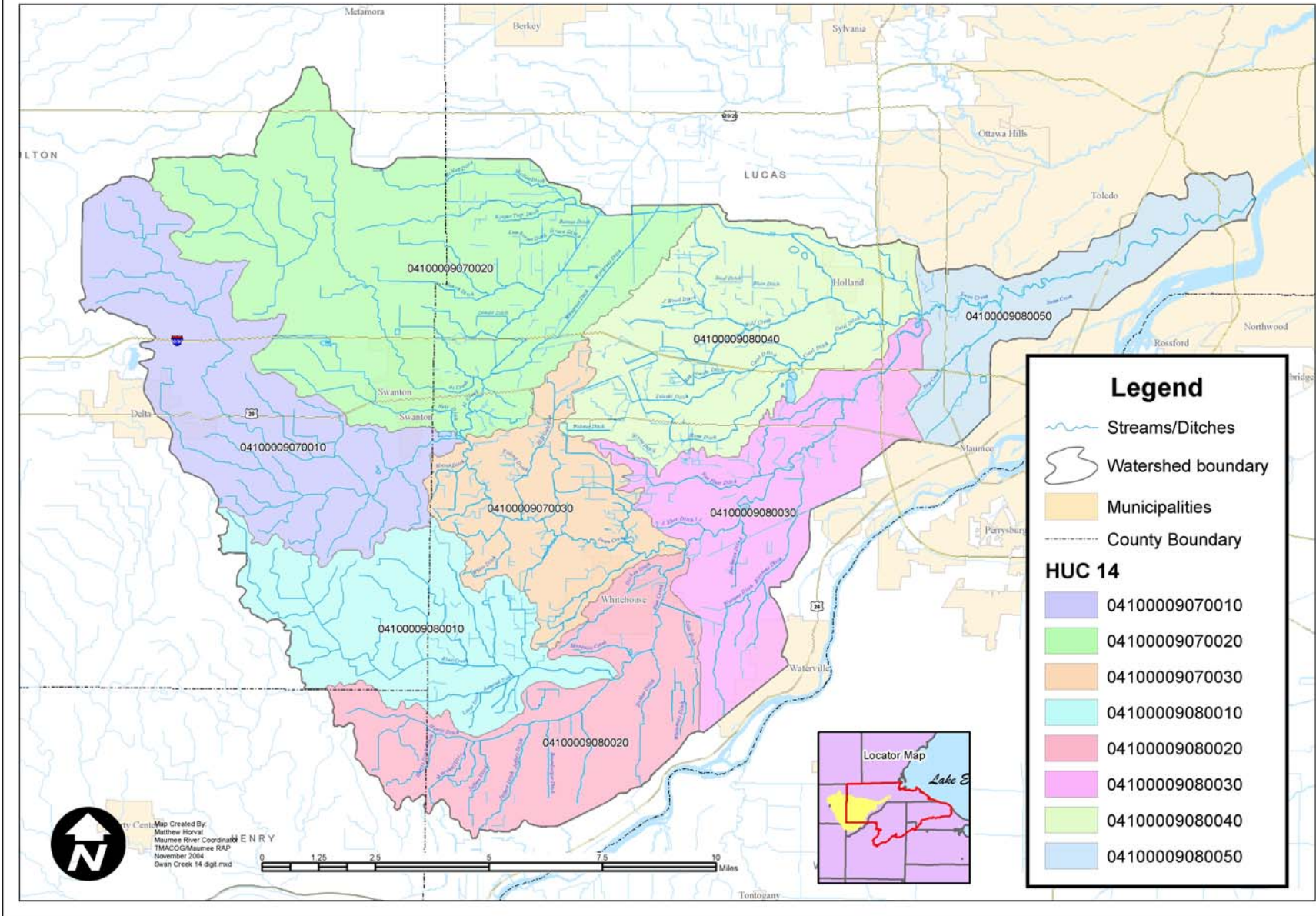
Swan Creek Watershed

HUC 04100009 070 and 04100009 080



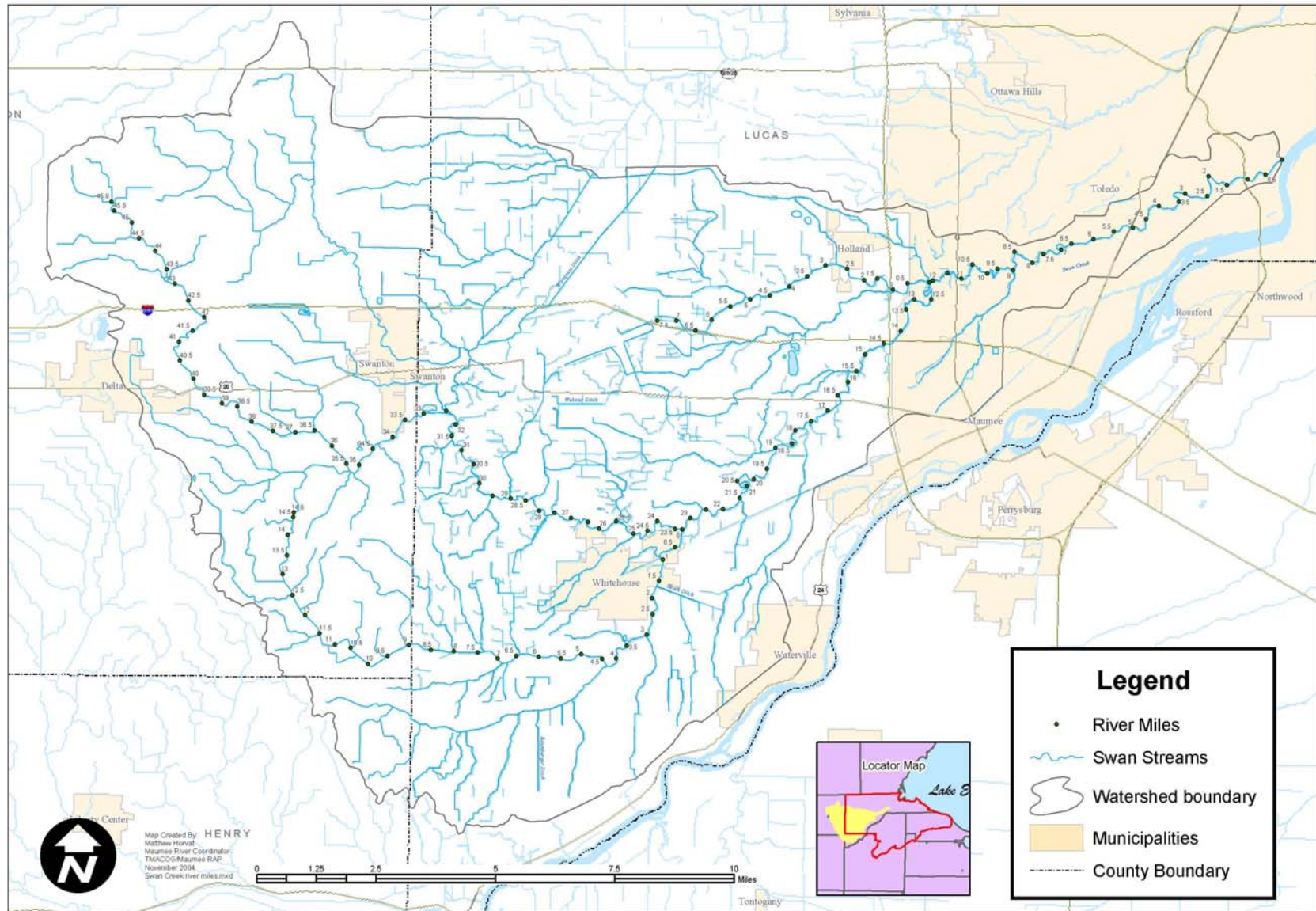
Swan Creek Watershed - 14 Digit Huc

HUC 04100009 070 and 04100009 080



Swan Creek Watershed - River Miles

HUC 04100009 070 and 04100009 080



See Volume 2 for the:

- Swan Creek/Blue Creek Watershed Projects Table
- Ai Creek Watershed Projects Table – NOT AVAILABLE

Bibliography

Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation
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“208” Areawide Water Quality Management Plan, TMACOG, 2003-2004.

References

¹ *Swan Creek Watershed Plan of Action*, Maumee RAP/TMACOG, April 2001.

² Ohio EPA, STORET Data, April 2004.

³ Ohio EPA, STORET Data, April 2004.

⁴ Ohio EPA, STORET Data, April 2004.

⁵ Ohio EPA, STORET Data, April 2004.

⁶ Ohio EPA, STORET Data, April 2004.

⁷ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.

⁸ Ohio EPA, STORET Data, April 2004.

⁹ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.

¹⁰ *Ohio EPA 305b Report*, Ohio EPA, 1996 and 2000.