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Product Developers

The Todd's Fork Watershed Action Plan was produced by the Little Miami River Partnership (LMRP), a 501 (c) (3) non-profit, environmental group located in the Little Miami River Watershed. The Plan was written during 2005-2006 by Dennis TenWolde, LMRP's Watershed Coordinator during that period. The LMRP By-laws are located in Appendix One (page 136).

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Special Thanks

This plan could not have been completed without the help and assistance of many different groups and people. Special thanks are in order to the Board of the Little Miami River Partnership: Stephanie Hines, Anne Lyon, Ron Volkerding, Jay Dorsey, Steve Miller, Eric Partee, Roy Joe Stuckey, Bruce Smith, Kimberley Mason, and Paul Berringer. Their dedicated service has enabled this project to succeed.

Special thanks are also in order to Laura Curliss and Roy Joe Stuckey – these two citizens of the Todd's Fork Watershed provided invaluable public support, networking, drive and document reviews. In addition, thanks are needed to all of the citizens who participated in the numerous public meetings held to create this plan.

Lastly, I would like to thank Rosida Porter of the ODNR. Although she did not live to see this plan completed, her dedication to watershed health and her bright smile were always there to encourage our work. She will be missed.

INTRODUCTION

Introduction

This Watershed Action Plan for the Todd's Fork watershed, a sub-watershed of the Little Miami River Watershed, represents a data and community-based approach to watershed management. As a data based plan, this document presents, analyses, and provides possible solutions for environmental problems based upon data from credible scientific sources. As a community-based plan, this document represents the needs and desires of the community in regards to environmental and community issues. The plan also represents a combined approach to watershed management; it attempts to combine the efforts of stakeholders, government and non-government organizations into a unified approach to organize and maximize the efforts of environmental programming in the Todd's Fork.

The focus of plan is two fold: to bring water bodies into compliance or to protect those already in compliance with Ohio's interpretation of the Clean Water Act and to address other environmental concerns having an impact on the watershed. This will be primarily accomplished by plan addressing non-point source pollution and other environmental and community-based issues within the watershed. Historically, point sources of pollution have been successfully addressed by various environmental laws overseen by the Ohio Environmental Protection Agency. But, under the Clean Water Act of 1972, both point and non-point sources of pollution were to be addressed. This plan represents an effort to address those other "non-point" source issues within the watershed.

This plan is not designed to be a static document. As conditions change, society grows and changes, new challenges arise, new data is gathered, and as environmental solutions are implemented, the issues in the watershed will also change. Because of this dynamic, this plan is designed to be reassessed every two years to remain current with what has happened, what is happening, and what needs to happen to protect the environment and the communities within the watershed.

As part of developing a unified approach to watershed management for the Little Miami River, the Todd's Fork Watershed Action Plan represents one of a series of watershed plans that are to be developed for sub-watersheds of the Little Miami River Watershed. Other watershed plans are: Upper Little Miami/Caser Creek Watershed Action Plan, Lower Little Miami Watershed Action Plan, and the East Fork Watershed Action Plans. By combining the efforts of all sub-watersheds into a coherent management plan, a more effective effort at addressing environmental and community issues can be developed.

The planning and writing of this watershed plan is being carried out by the Little Miami River Partnership. The Little Miami River Partnership (LMRP) is a non-profit, environmental service organization, who, through a 319 grant from the Ohio Department of Natural Resources (ODNR) and the Ohio Environmental Protection Agency (OEPA), along with a partnership of eight Ohio Soil and Water Conservation Districts, were tasked to develop a data and community based watershed plan for the Little Miami River

Watershed (LMRW). This plan has been reviewed and accepted by the ODNR, OEPA, the SWCD partners, and the group of stakeholders who provided the community based watershed aspect of the plan.

The Todd's Fork Watershed Action Plan Development Process

The Todd's Fork Watershed Action Plan will be developed in three phases. These phases are data analysis, community issue analysis and compilation.

The data analysis phase first involves the collection of current and valid data about the environmental, cultural, and community conditions within the watershed. This data is represented in Chapter 2: Watershed Inventory. The watershed coordinator, aided by a technical team, then analyzed this data to determine impairments to the environment within the watershed and data deficiencies. This is represented in Chapter 3: Water Resource Quality.

The community issue analysis phase involved the holding of an initial public meeting of the public and stakeholders from the watershed. The purpose of the public meeting was to determine the main issues the public felt should be addressed to restore and/or protect the watershed environment and communities. Next, a set of public meetings on each main issue were held to collect more input into specific issues, sources of information, possible partners and specific actions that could be undertaken. This process is represented in Chapter 4: Community Water Resource Management Interests.

The last phase, compilation, entailed merging the data-driven environmental issues and data deficiencies with the community environmental issues. With a set of various partners, a series of goals for each impairment, deficiency and issue was developed. The partners then agreed to undertake those specific goals, based upon a timeline and partner abilities and funding opportunities. This is represented in Chapter 5: Watershed Restoration and Protection Goals.

After the Todd's Fork Watershed Action Plan was completed it was presented back to the local partners and public for approval. The plan was submitted to the Ohio Department of Natural Resources for State of Ohio approval.

In this manner, the Todd's Fork Watershed Action Plan represents the combining of data driven and community driven issues affecting the watershed. This combined effort will bring diverse partners and funding together to address environmental issues in a coordinated manner to maximize efforts and results. The plan will be updated every two years to take into account new data, issues, partners, funding, community needs, and accomplishments.

The Todd's Fork Watershed Action Plan

The Todd's Fork Watershed Action Plan is separated into 5 chapters. These are:

1. Introduction

2. Watershed Inventory
3. Water Resource Quality
4. Community Water Resource Management Interests
5. Watershed Restoration and Goals

Evaluation

The effectiveness of the watershed action plan will be evaluated yearly by the Little Miami River Partnership. This evaluation will be based upon the number of goals carried out, completed, underway, or funded, additional partners gained to help with specific responses, and what data shows as improvement, stasis, or degradation in the environment.

Little Miami River Partnership Watershed Coordinator

The Little Miami River Partnerships's (LMRP) Watershed Coordinator is responsible for the development of four Watershed Action Plans (WAP) for all of the Little Miami River subwatersheds. This includes the development of WAPs for the Upper Little Miami River and Caesar's Creek Watershed, Todd's Fork, Lower Little Miami River Watershed, and to provide assistance to the East Fork Watershed Consortium in developing WAPs for the East Fork Watershed. This responsibility stems from LMRP's overall mission of improving the environment within the Little Miami River Watershed and from a contract with the Ohio Department of Natural Resources and eight Soil and Water Conservation Districts. For the Todd's Fork Watershed our main partners are the Warren and Clinton Soil and Water Conservation Districts. If you have any questions concerning this document, the process by which it was developed and endorsed, or about LMRP, please contact LMRP's Watershed Coordinator at (513) 695-1187 or by e-mailing dtenwolde@littlemiamiriver.org.

The Little Miami River Partnership

In 1995, the representatives from the USDA, the Miami Valley Resource Conservation and Development Council (RC&D), the Ohio EPA and Miami University held a Regional Water Quality Symposium in Southwest Ohio. From this symposium a number of individuals from the Little Miami River area started to talk of their interest in working on environmental issues on a watershed basis.

In 1996, John Kellis, from the Miami Valley RC&D, Bob Gable, from the Ohio Department of Natural Resources South West Scenic Rivers Office and Bruce Smith, from the Ohio Environmental Protection Agency, worked together to form a group of interested people who would like to address environmental issues for the Little Miami Watershed. Through a number of formative meetings, held with people from the communities and the governments within the Little Miami River Watershed, it was found that a lot of environmental work was being accomplished, but efforts were often times isolated and uncoordinated. This led to the formation of an organization that could provide assistance on environmental programs and unify programs for a more

comprehensive approach. After numerous brain-storming sessions, the group decided to form a formal organization, and developed by-laws, priorities and strategies, and sub-committees representing each of the five sub-watersheds of the Little Miami River: The Upper Little Miami River, Caesar's Creek, Todd's Fork, East Fork, and the Lower Little Miami River. The new organization, at that time unnamed, would have 9 board members: one representing each of the sub-watershed areas and 4 at-large members.

In 1997, the organization elected its first interim Board of Directors, continued the process of inviting businesses, governments and citizens to be part of the group, and developed the name: "The Little Miami River Partnership." Continuing its development, the Partnership submitted articles of incorporation and applied for non-profit status. Lastly, they applied for an Ohio EPA Pilot Planning Grant through the Miami Valley RC&D.

In 1998, the new Little Miami River Partnership (LMRP) elected its first Board of Directors and officers. LMRP, through the Miami Valley RC&D, received the Ohio EPA Pilot Planning Grant. The Miami Valley RC&D was then able to hire a Planning Administrator to assist LMRP in its development as a watershed organization.

In 1999, LMRP received status as an incorporated, non-profit 501 (c) (3) organization.

From 1998 to 2000 the Planning Administrator was able to provide LMRP with help to develop as a broad-based, service-oriented environmental organization. This process required even more input and cooperation from local communities, elected-officials and governments into the organization. It was also during this period that the organization determined that a unified, planned approach to identifying and addressing watershed issues could benefit everyone within the watershed.

In 2000, LMRP applied for and received a six-year Watershed Coordinator grant, funded by the State of Ohio and the US EPA. The grant is primarily to assist each sub-watershed of the Little Miami River develop and write a comprehensive watershed plan. LMRP's main partners are the Soil and Water Conservation Districts within the watershed.

In 2001, LMRP hired its first full-time employee: Sarah Hippensteel, LMRP Watershed Coordinator. Since that time, LMRP has aggressively worked on Total Daily Maximum Load's (TMDL), watershed plans, educational programming, symposiums, and developing and gathering community input for the watershed planning process. The first TMDL completed in the Little Miami Watershed was for the Upper Little Miami River and Caesar's Creek sub-watersheds in 2003. Additional discussions during this time led to the development of a Watershed Coordinator position for the East Fork of the Little Miami River. The first watershed plan for the Little Miami River Watershed was completed in 2003 in the East Fork sub-watershed. By the end of 2005, three more watershed plans, two in the East Fork and one for the Todd's Fork are targeted for completion.

CHAPTER 2: WATERSHED INVENTORY

The Watershed Inventory

This chapter summarizes the Todd's Fork Watershed characteristics that will be used to evaluate the most effective watershed management practices for Todd's Fork. This section includes information on: watershed geography, demographics, geology, soils, endangered animals, physical stream characteristics, climate, 100 year floodplains, land-use, bedrock and glacial aquifers, eco-regions, perennial streams, public water supply, climate, precipitation, sub-watershed regions, point sources data, and storm water issues. If the materials are available in a usable GIS format, a representative map of the data is provided.

Little Miami River Watershed

The Little Miami River is Ohio's first National and State Scenic River and flows through Southwest Ohio until it joins the Ohio River southeast of Cincinnati. The Little Miami River Watershed is all of the geographical area that drains into the Little Miami River (see Figure 1). The Little Miami River is 105.5 miles long and drains an area of 1757 square miles and its 8 digit HUC is 05090202. The watershed covers 11 counties: Clark, Montgomery, Madison, Greene, Warren, Butler, Clinton, Clermont, Brown, and Highland (see Figure 1). The watershed is composed of 5 major sub-watersheds. These are the Upper and Lower Little Miami River, Caesar's Creek, Todd's Fork, and the East Fork watersheds.

Upper Little Miami River Watershed

Length:	----
Drainage Area:	414 square miles
HUC 11:	05090202010, 05090202020, 05090202030
Counties:	Clark, Madison, Greene, Montgomery, Warren

Lower Little Miami River Watershed

Length:	----
Drainage Area	341 square miles
HUC 11:	05090202060, 05090202090, 05090202140
Counties:	Warren, Clermont, Hamilton

Caesar Creek Watershed

Length:	33.9 miles
Drainage Area:	242 square miles
HUC 11:	05090202040, 05090202050
Counties:	Warren, Clermont, Greene

Todd Fork Watershed

Length:	35 miles
Drainage Area:	261 square miles

HUC 11:	05090202070, 05090202080
Counties:	Clermont, Clinton, Warren

East Fork Watershed

Length:	81.7 miles
Drainage Area:	499 square miles
HUC 11:	05090202100, 05090202110, 05090202120, 05090202130
Counties:	Warren, Clermont, Clinton, Highland

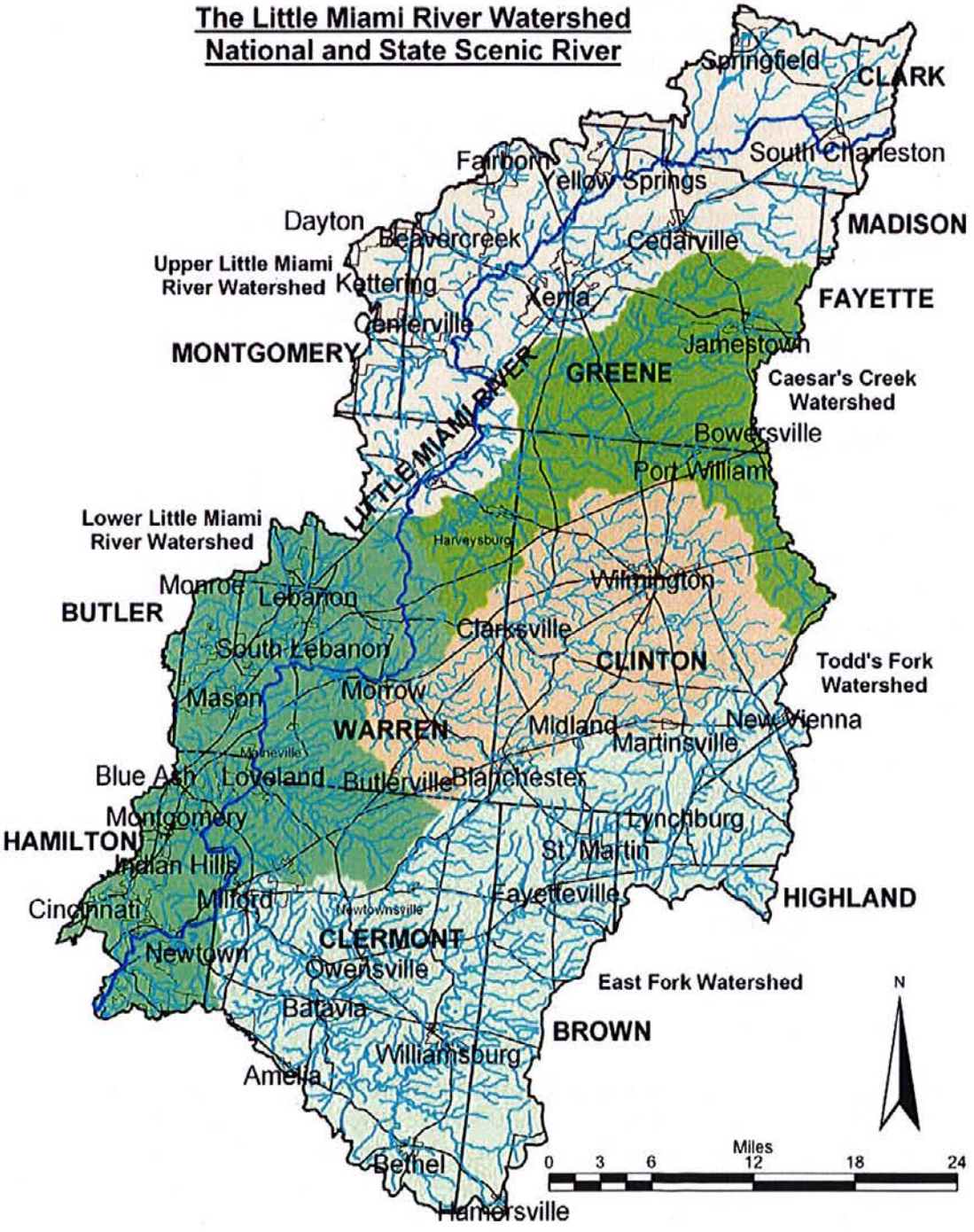

Figure 1. The Little Miami River Watershed

The Little Miami River, all of the East Fork (except from the headwaters to RM 75) and Stonelick Creek of the East Fork Watershed; Lick Run and Cowan Creek of the Todd

Fork Watershed; Olive Branch; Caesar Creek (Anderson Fork to Mouth), Flat Fork Jonahs Run, Trace Run, Turkey Run, Buck Run, Anderson Fork of the Caesar Creek Watershed; Oldtown Creek of Massie Creek, Yellow Springs Creek, and the North Fork are designated as State Resource Waters.

All of the Little Miami River (except from RM 3.0 to mouth and headwaters to RM91.64 (North Fork)), East Fork (except headwaters to RM 75), Dodson Creek of the East Fork Watershed, Halls Creek; Lick Run and Dutch Creek of the Todd Fork Watershed; Caesar Creek (except from headwaters to RM 23.78 (South Branch)), Anderson Fork (only from Grog Run to mouth) and South Branch (only from RM 4.0 (Paintersville-New Jasper Road) to mouth) of the Caesar Creek Watershed; Newman Road, Unnamed tributary (Little Miami River RM 60.50); Clark Run and an unnamed tributary (Massie Creek RM 5.3) of Massie Creek; Jacoby Branch and Yellow Springs Creek are designated Exceptional Warm Water Habitat. Conner Branch is a designated Cold Water Habitat.

The Todd's Fork Watershed

The Todd's Fork watershed represents the geographical area that drains into the Todd's Fork and then drains into the Little Miami River at Marrow. The Todd's Fork is 35 miles long and drains an area of 261 square miles. The watershed contains 2 11 digit HUCS: 05090202070, and 05090202080. These two 11 digit HUCS contain 11 14 digit HUCS (see Figure 2):

- 05090202070010
- 05090202070020
- 05090202070030
- 05090202070040
- 05090202070050
- 05090202070060

and

- 05090202080010
- 05090202080020
- 05090202080030
- 05090202080040
- 05090202080050

The watershed is located primarily in Warren and Clinton counties, with a small section also located in Clermont County (see Figure 2). The watershed encompasses the following Warren County Townships: Harlan, Salem, and Washington; Clinton County Townships: Adams, Chester, Clark, Green, Jefferson, Marion, Richland, Union, Vernon, and Washington; and Wayne Township in Clermont County.

The City of Wilmington is the only Phase II Stormwater community in the Todd's Fork Watershed.

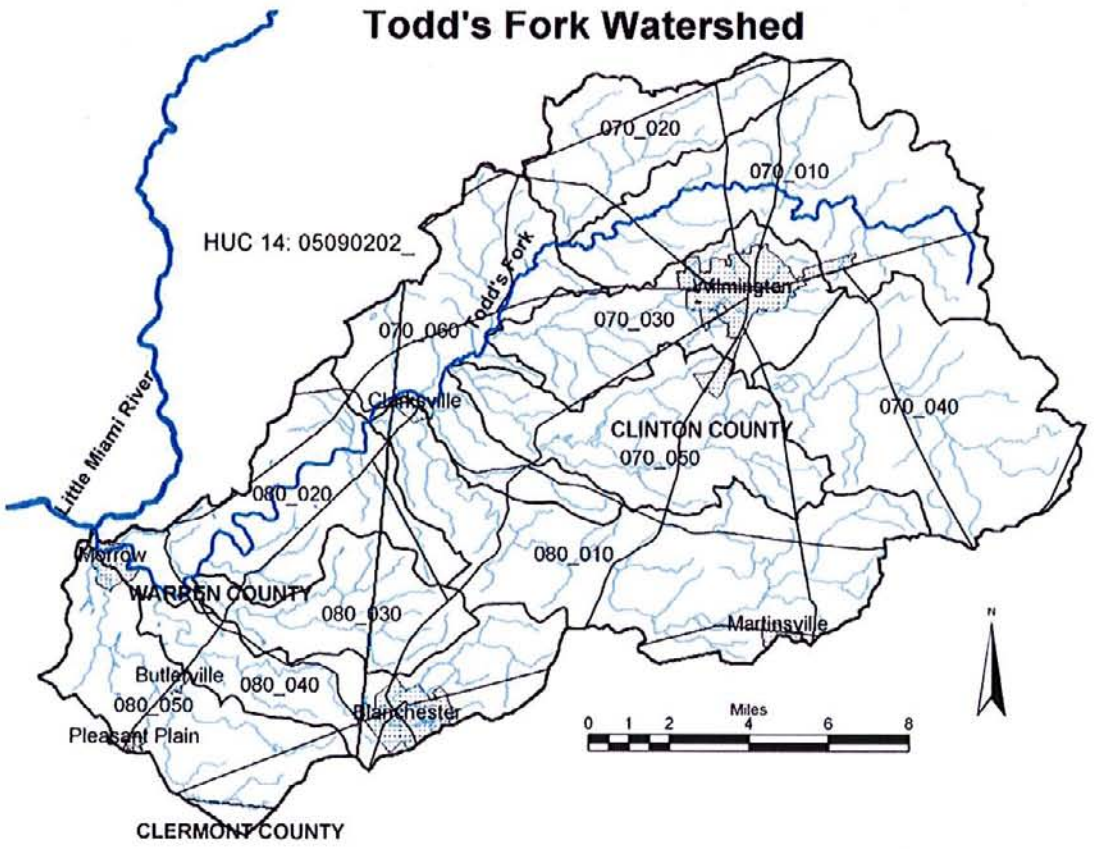

Figure 2. The Hydrologic Codes for the Todd's Fork Watershed

The major named streams of the Todd Fork Watershed are:

Tributary	Length	Drainage Area
First Creek	7 miles	19.8 sq miles
Martin Run	3.2 miles	4.8 sq miles
Second Creek	13.5 miles	20.1 sq miles
Lick Run	4.9 miles	13.2 sq miles
Sugar Run	1.6 miles	3.1 sq miles
Little East Fork	19.6 miles	38.9 sq miles
Stony Hollow	1.5 miles	3 sq miles
Sewell Run	4.4 miles	5.04 sq miles
Cowan Creek	22.4 miles	54.2 sq miles
Wilson Creek	3.6 miles	4.29 sq miles
Indian Run	2 miles	4.85 sq miles
Lytle Creek	10.1 miles	20 sq miles
Little Creek	2.8 miles	4.62 sq miles
Moore Branch	2.1 miles	1 sq mile
Dutch Creek	5.5 miles	14.8 sq miles
Dry Run	1.1 miles	8.03 sq miles

The Todd Fork Watershed contains two State Resource Waters (Lick Run and Cowan Creek) and two Exceptional Warm Water Habitat streams (Lick Run and Dutch Creek).

Demographics

The Todd's Fork watershed has seen a faster rate of population growth than the rest of the United States or Ohio. Population growth in the Todd's Fork is three times that seen for Ohio as a whole. In addition, the working population is increasing the travel time they take to get to their place of employment. As population increases so does the need for infrastructures to support those populations. These two factors could contribute to degradation of natural resources and water quality. Tables 1 and 2 provide extra details into the population changes that are affecting the Todd's Fork Watershed

Parameter	1990	2000
Total Population	32,920	38,777
Total Urban Population	14,430	14,570
Total Rural Population	18,490	24,207
Total White Population	32,148	37,203
Total Black Population	659	826
Total Other Race Population	113	748
Total Hispanic and Latino Population	141	370
Population Under 18	8,990	10,030
Population 18-21	1,984	2,481
Population 22-39	8,948	9,566
Population 40-64	8,797	12,099
Population 65+	4,201	4,601
Workers Driving less than 20 minutes	7,519	9,099
Workers Driving more than 20 minutes	7,056	9,473
Workers working at home	570	735
Household Median Income	$30,476	$42,781

Table 1. 1990 and 2000 US Census Data for the Todd's Fork Watershed

Todd's Fork % Population Increase:	18%	
State of Ohio:	5%	
USA:	13%	
Ohio Population:	1990: 10,847,115	2000: 11,353,140
USA Population:	1990: 248,709,873	2000: 281,421,906
Todd's Fork % Household Median Income Increase:		40%
State of Ohio:		43%
USA:		40%
Median Income for Oho:	1990: $28, 706	2000: $40,956
Median Income for USA:	1990: $30,056	2000: $41,994

Table 2. Comparative Demographic Values for Todd's Fork Watershed, the State of Ohio, and the USA for the 1990 and 2000 US Census

Geology

The geologic composition of the Todd's Fork watershed is the fundamental underlying structure of the entire water system. Different types of bedrock provide the presence of different minerals, materials, and rates of erodibility. Correspondingly, those rates of erodibility provide for differences in shape and slope of bedrock areas; and then in turn, correspond to differences in capacity to hold and allow transit of water (i.e. permeability). The permeability of the surface soils and glacial materials relates specifically to the volume of water available and rate at which the water can be pumped from the ground.

Similarly, the geologic materials covering the bedrock, such as glacial till, also provides a direct correlation to the amount and quality of water resources in a given area. Different rates of erodibility, holding capacity, permeability and composition directly affect the water quality and quantity in an area.

The bedrock within Todd's Fork watershed is primarily composed of limestone and shale. In the eastern portion of the watershed, the bedrock is primarily Silurian (408 to 438 million years old); whereas, on the western side it is primarily Ordovician (438 to 505 million years old) (See Figure 3). The depth and topographical surface of the bedrock in the watershed was typical of heavily glaciated portions of Ohio. There are remnants of old water courses scoured, from glacial melt waters, into the bedrock throughout the watershed. Bedrock topography is typically higher in the West than East. There are currently no known karst formations in the area. Many of Todd's Fork's headwater streams and tributaries streambeds lie directly on the bedrock.

The bedrock is overlain throughout the entire watershed with glacial material (See Figure 4). The glacial materials are mostly alluvial in nature and are usually from 25 to 100 feet thick.

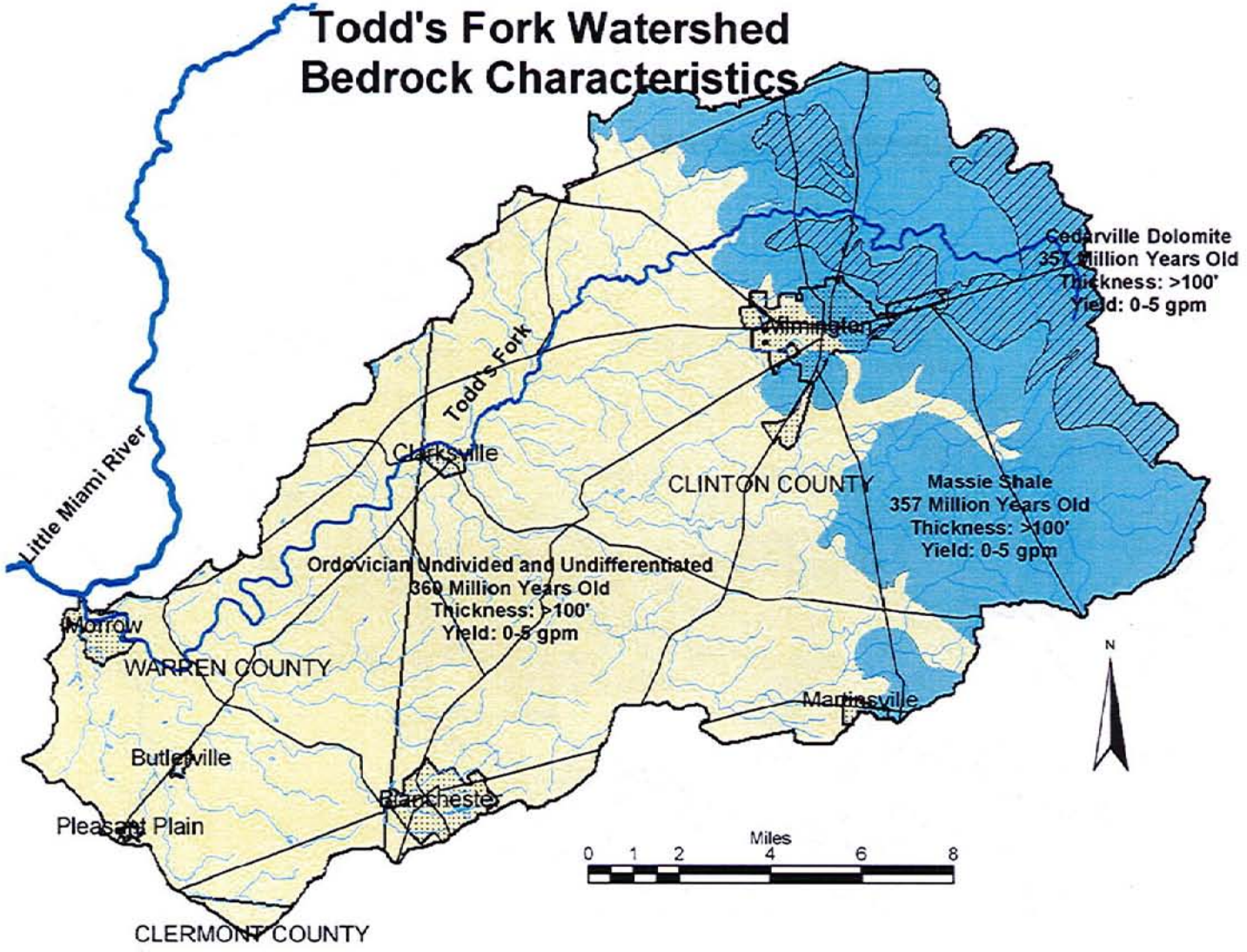

Figure 3. Bedrock Characteristics of the Todd's Fork Watershed

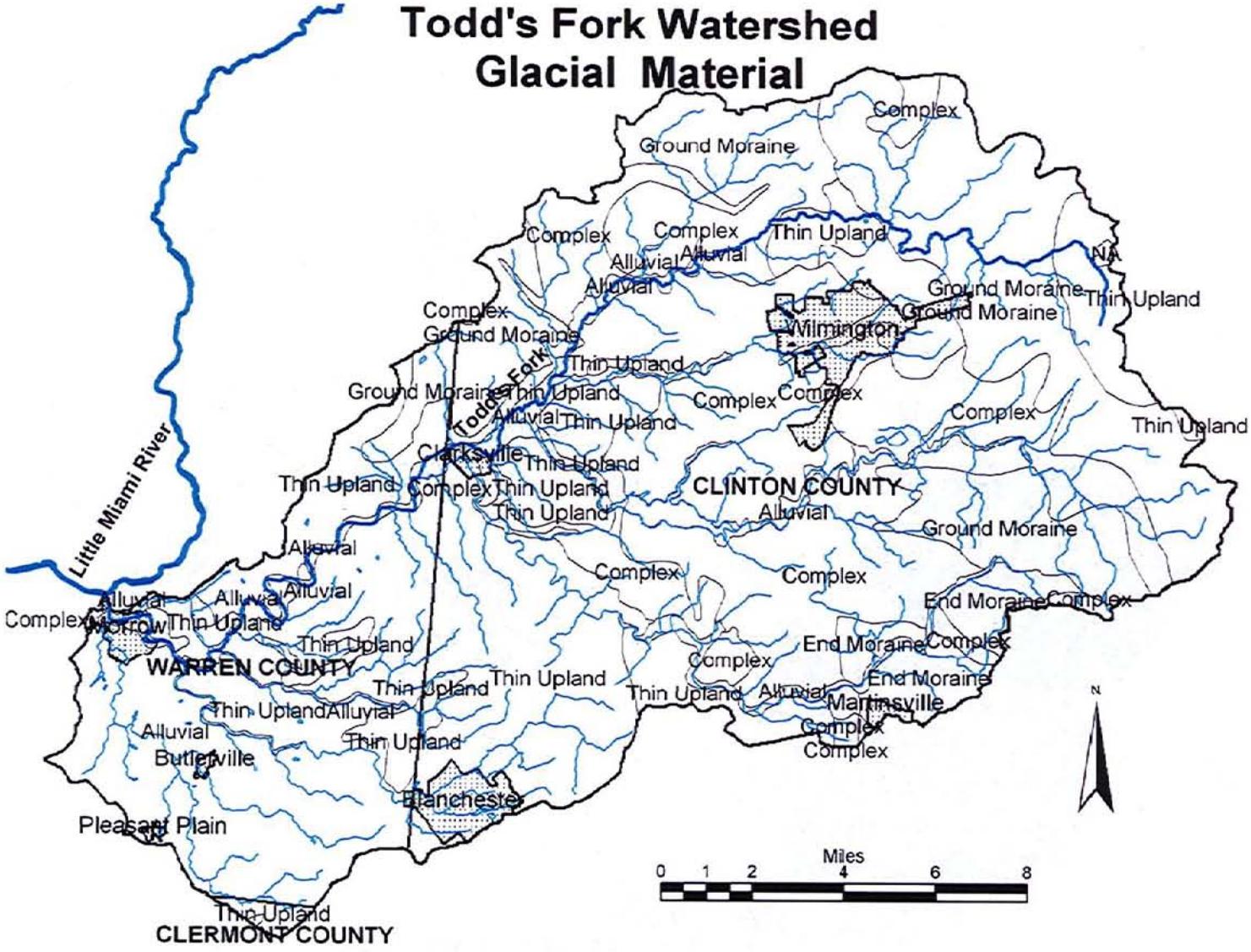

Figure 4. Glacial Material Characteristics of the Todd's Fork Watershed

Topology

Surface topography directly impacts the erodibility of the local streams and water courses. The steeper the slope the more the water can erode the streambed, due to the increased speed of the water. The surface topography is approximately 1000 feet above median sea level (msl) in the east to 800 feet above msl in the west (See Figure 5).

Upper Todd's Fork (HUC: 070_010), Dutch Creek (HUC: 070_20), upper Cowan Creek (HUC: 070_040), upper Lick Run (080_030), and upper Second Creek (HUC:080_040) watersheds are generally flatter, less rolling hill areas, with slopes increasing by the streams. All other stream watersheds are generally more hilly with increased slopes and more severe slopes around streams.

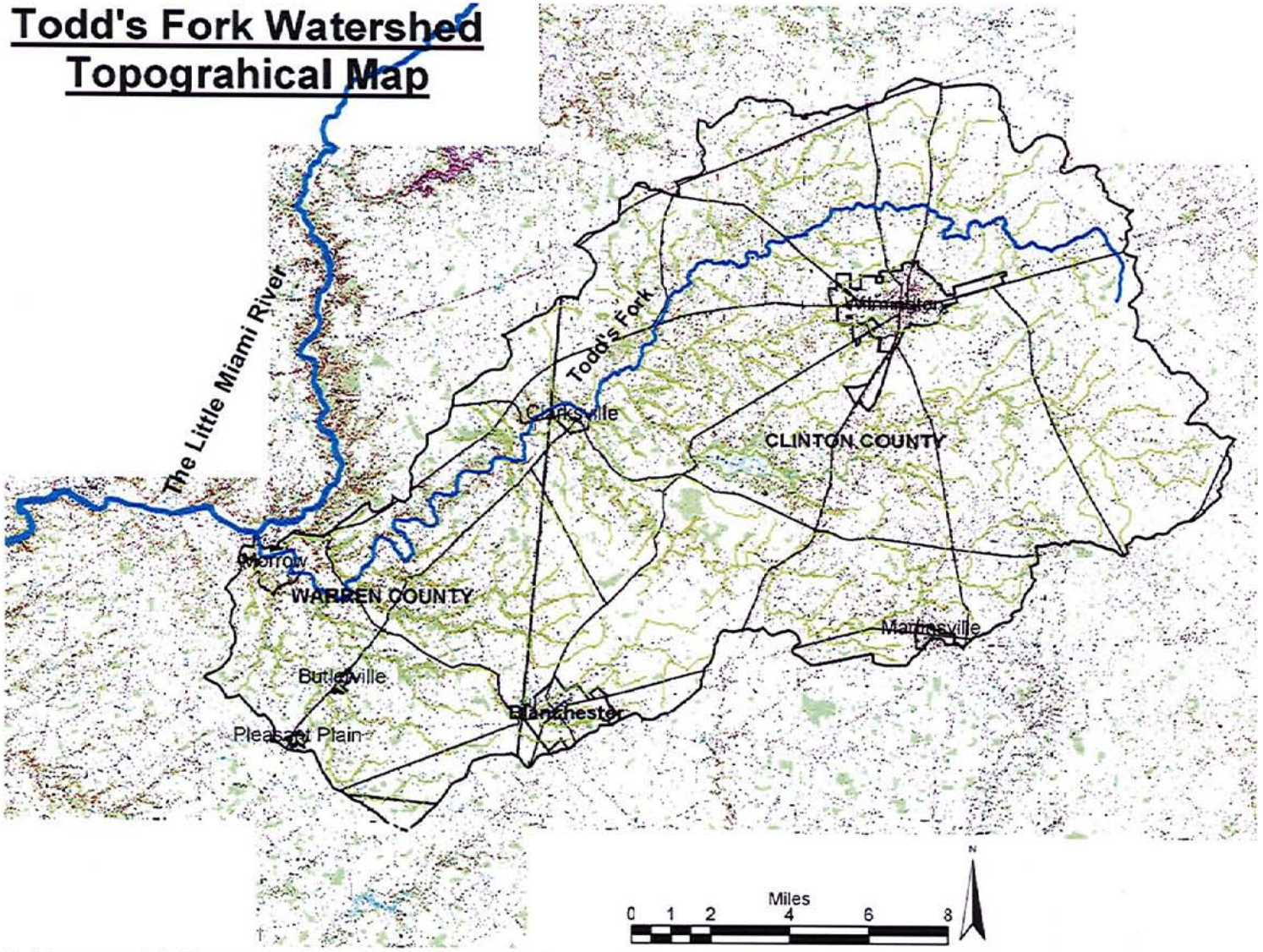

Figure 5. Topographic Features of the Todd's Fork Watershed

Soils

Soils are an important characteristic in evaluating best management practices. Soil erodibility, permeability and water retention characteristics directly affect the amount and characteristics of water in a watershed. In addition, different types of soils provide different dissolved minerals and other materials that make up the streams water quality or chemistry. All of these factors directly impact the physical structure of a stream as well as the quality of habitat.

The Todd's Fork watershed covers parts of Clinton, Clermont, and Warren Counties. Approximately ¼ of the watershed is in Warren County, while the other ¾'s is in Clinton County. Very little of the watershed, less than 1%, is in Clermont County. The reason that this is important is that each of the counties soil data is in different stages of being re-evaluated. Clinton County has a new SSURGO certified, digitized soils map from 2004. This new soils map includes redefinitions of soil types, higher level of details, and renaming of some series. NRCS and ODNR are just starting to update soils information; the only data available is from the1968 Soil Survey. This means that there is a difference between levels of detail, soil compositions relating to name type, and new names in the Todd's Fork watershed area. Therefore, the information provided below is a combined approximation of this information and similarities are grouped, when possible. SSURGO certified, digitized soils map for Warren County should be available in late 2005 and this section will then be updated.

According to the soil survey's from the USDA Natural Resources Conservation Service, the Todd's Fork has over six soil associations, the main four of which are the Fincastle-Treaty-Xenia Association, Xenia-Miamian-Russell Association, Westboro-Clermont-Jonesboro (Clermont-Avonburg in Warren County) Association and the Rossmoyne-Hickory Association. There are more than 10 soil associations found in the Todd's Fork Watershed. The dominate soil series in the watershed are the Westboro (Avonburg), Fincastle, Xenia, Treaty, Clermont and Miamian. There are more than 25 different soil found in the watershed. Each of the soils series have their own physical and chemical properties making some soils better suited for certain management practices than others.

Table 3 describes the most common types of soil series found in the Todd's Fork watershed. No single soil series accounts for more than 8% of the soil types found in the watershed. The prominent feature of the soils in the watershed is that they are highly diversified soils with varying characteristics.

Soil Series	Permeability	Drainage	Runoff	Seasonal High Water Table (feet)	Topo	% Soil Type in Watershed	Limitations
Westboro (Avonburg)	Moderate to Moderate Low	Somewhat Poorly	Low	.5-2.0	Nearly Level to Gentle Slopes	5%+	Restricted permeability and high seasonal water table create limitations for septic tank systems
Fincastle	Very Slow	Somewhat Poorly	Low	1.0-1.5	Nearly Level to Gently Sloping	5%+	Restricted permeability and high seasonal water table create limitations for septic tank systems
Xenia	Moderate to Moderate Slow	Moderately Well	Low	1.5-5.0	Nearly Level to Steep	8%+	Restricted permeability, increasing slope and high seasonal water table create limitations for septic tank systems; slope water erosion
Miamian	Moderately Slow to Very Slow	Moderately Well	Very High	2.5-3.5	Nearly Level to Steep	5%+	Restricted permeability, increasing slope and high seasonal water table create limitations for septic tank systems; slope water erosion
Clermont	Very Slow	Poor	Negligible	At or near surface	Nearly Level	5%+	Unsuitable for septic systems due to ponding
Treaty	Moderate to Slow	Poor	Negligible	At or near surface	Nearly Level	12%+	Unsuitable for septic tank absorption fields; ponding

Table 3. Most Common Series and Characteristics of Soils for the Todd's Fork

Nutrient Loadings

Based upon the use of STEPL model, with information provided from land uses, soil characteristics, septic systems, and animal concentrations, an estimate of loadings was developed (See Table 4). This information contains no nutrient loadings for any type of waste water treatment plants because the STEPL model does not include that type of data. Waste water treatment plant data is provide in a later section.

1. Total load by sub-watershed(s)

Watershed	N Load (no BMP)	P Load (no BMP)	BOD Load (no BMP)	Sediment Load (no BMP)
HUC: 05090202_	lb/year	lb/year	lb/year	t/year
_070_010	126582.2	29449.4	257671.1	7618.7
_070_020	75451.1	16568.2	160261.8	3521.8
_070_030	69355.9	10485.0	230030.9	3472.7
_070_040	187215.6	41986.7	376955.5	8043.3
_070_050	65544.2	14822.1	158122.1	3518.7
_070_060	81486.3	17426.8	189091.4	4806.8
_080_010	252906.3	58541.9	482464.3	10841.9
_080_020	117356.2	26171.4	248663.5	6170.1
_080_030	88130.3	21253.8	186632.3	4377.3
_080_040	128970.5	28002.1	304819.0	5898.0
_080_050	129733.8	29035.1	292914.5	6010.3
Total	1322732.5	293742.6	2887626.3	64279.5

2. Total load by land uses (with BMP)

Sources	N Load (lb/yr)	P Load (lb/yr)	BOD Load (lb/yr)	Sediment Load (t/yr)
Urban and Septic	187658.5	26680.1	753604.6	7286.6
Cropland	1033393.6	255231.8	1814863.6	55266.6
Pastureland	95169.3	8649.6	303204.0	1524.1
Forest	6511.0	3181.1	15954.1	202.2
Feedlots	0.0	0.0	0.0	0.0
User Defined	0.0	0.0	0.0	0.0

Table 4. Nutrient Loadings for the Todd's Fork Watershed

Endangered Species

The Ohio Department of Natural Resources, Division of Natural Areas and Preserves, maintains a list of currently-listed and located endangered, threatened, and rare species for Ohio. From this list the endangered species located in Todd's Fork were mapped (See Figure 6). This information is vitally important for watershed management since endangered species habitat should be protected or improved to preserve the endangered species.

There are three endangered vertebrate species found in the Todd's Fork watershed. One is the Rough Green Snake (*Opheodrys aestivus*) and two are local breeding birds, the Upland Sandpiper (*Bartramia longicaudia*) and the Loggerhead Shrike (*Lanius ludovicianus*).

The Tiger Salamander (*Ambystoma tigrinum*) is the only endangered amphibian currently found in the watershed.

Two endangered invertebrate species, the Cincinnati Crayfish (*Cambarus ortmanni*) and the Cobblestone Tiger Beetle (*Cicindela marginipennis*) are found in the watershed.

Besides two different identified mollusk bed areas, there are four endangered mollusks found in the Todd's Fork watershed. They are the Fawnsfoot (*Truncilla donaciformis*), the Pink Papershell (*Potamilus ohiensis*), Stout Floater (*Anodonta Grandis copulenta*), and the Deer Toe (*Truncilla truncate*).

Among endangered plant species, there is an identified Oak-Maple Swamp and four different endangered trees and plant species in the watershed. They are the Pursh's Bullrush (*Scirpus purshianus*), Pumpkin Ash (*Franxinus tomentosa),* Northern Fox Grape (*Vitis labrusca*) and the Long-beaked Arrowhead (*Sagittaria australis*).

Currently, there are no identified endangered macro-invertebrates in the Todd's Fork.

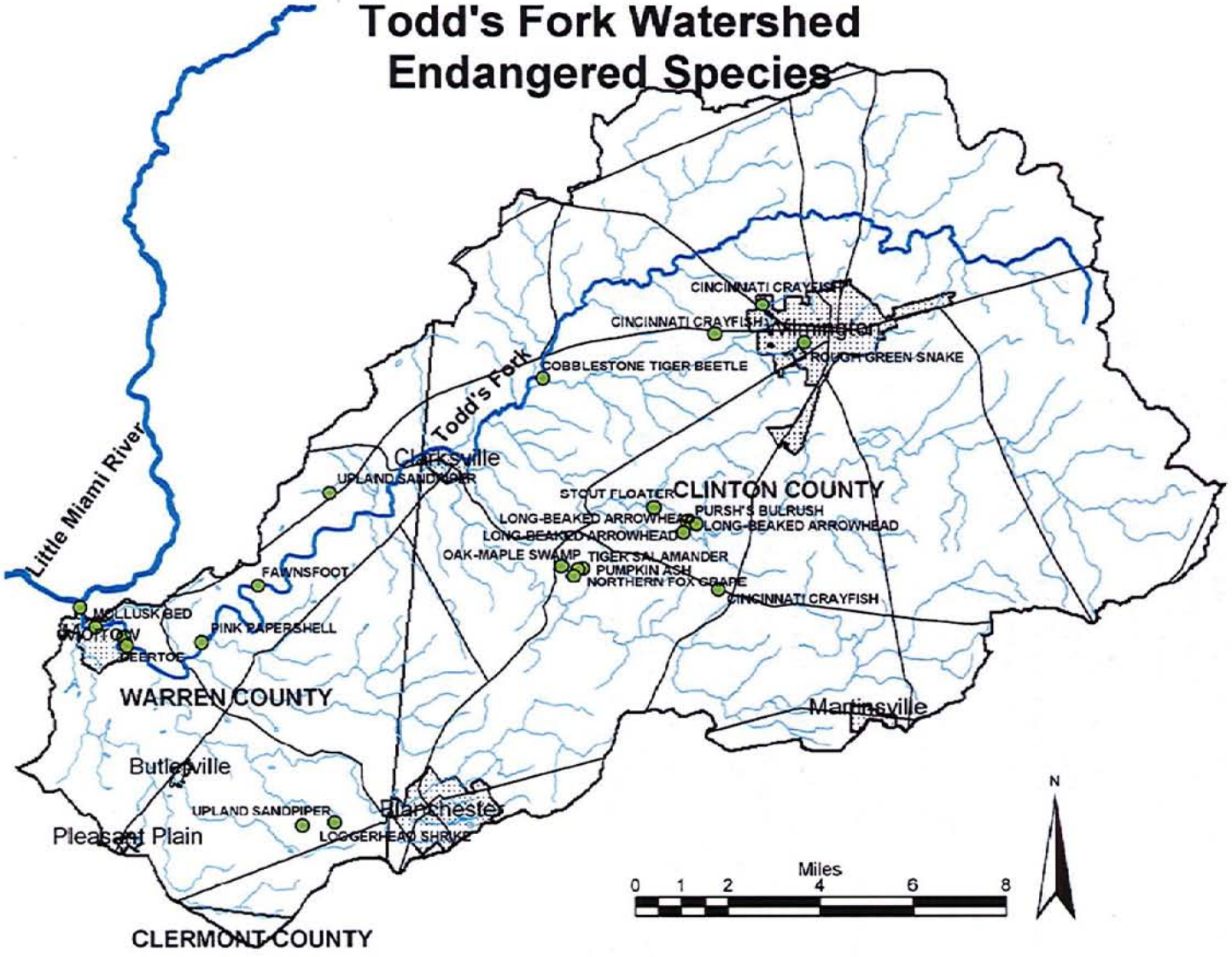

Figure 6. Endangered Species of and Locations in the Todd's Fork Watershed

Climate and Precipitation

The Todd's Fork watershed has a temperate climate with well-defined summer and winter seasons. During winter the coldest month is January, with an average high temperature of 34.9 degrees F and an average low temperature of 18.6 degrees F (based upon averages from 1971 to 2000, Climate Station: 339219 Wilmington 3N, OH). The coldest day on record was January 17th, 1982, with a temperature of -25 degrees F. Average annual snowfall is 23.2 inches with January historically receiving the most annual snowfall, on average 8.2 inches. The single one-day heaviest snowfall recorded was 14.0 inches on November 26th, 1950. The heaviest total snowfall for a season occurred in the 1950 to 1951 winter season, with a total of 75.9 inches.

The most probable date of the start of freezing in the Fall is by September 27th (One year in ten it freezes before this date) and the most probable end date of freezing in the Spring is May 15th (One year in ten it freezes after this date). The growing season, days above 32 degrees F, is 145 days (Nine years out of ten).

Summer's warmest month is July with an average high of 83.8 degrees F and an average low of 62.7 degrees F. The one-day maximum high ever recorded was 111 degrees F on July 7th, 1934. Average annual precipitation for the watershed is 41.38 inches, on average, with May being the wettest month, with an average of 4.90 inches of precipitation received per year. The single one-day maximum heaviest rainfall ever received was 5.35 inches on July 21st, 1954. The most annual precipitation ever recorded was 61.61 inches in 1929 and the lowest annual precipitation was 23.74 and occurred in 1930.

Surface Water

The Todd's Fork watershed is the entire geographical region that drains into the Todd's Fork. Figure 7 provides details of the streams and tributaries of the Todd's Fork. The Todd's Fork is 35 miles long and has a total drainage area of 261 square miles. The main stem of the Todd's Fork runs from east of Wilmington to Morrow. There are 16 named tributary streams in the watershed. These are:

Tributary	Length	Drainage Area
First Creek	7 miles	19.8 sq miles
Martin Run	3.2 miles	4.8 sq miles
Second Creek	13.5 miles	20.1 sq miles
Lick Run	4.9 miles	13.2 sq miles
Sugar Run	1.6 miles	3.1 sq miles
Little East Fork	19.6 miles	38.9 sq miles
Stony Hollow	1.5 miles	3 sq miles
Sewell Run	4.4 miles	5.04 sq miles
Cowan Creek	22.4 miles	54.2 sq miles
Wilson Creek	3.6 miles	4.29 sq miles
Indian Run	2 miles	4.85 sq miles
Lytle Creek	10.1 miles	20 sq miles
Little Creek	2.8 miles	4.62 sq miles
Moore Branch	2.1 miles	1 sq mile
Dutch Creek	5.5 miles	14.8 sq miles
Dry Run	1.1 miles	8.03 sq miles

Dutch Creek and Lick Run are designated as Exceptional Warm Water Habitat, Lick Run and Cowan Creek are designated as State Resource Waters. All the rest of the named tributaries and the main stem of Todd's Fork are designated Warm Water Habitat.

There are six stream gauges operated by the US Geological Survey in the watershed. Currently, none of those stream gauges have any data that is newer than 1983.

Figure 8 represents the perennial streams of the Todd's Fork watershed. In addition, one man-made lake, Cowan's Lake, exists midway along the Cowan's Creek. There a number of smaller ponds created for agricultural needs throughout the entire watershed.

There is no evidence of oxbow cutoffs in the Todd's Fork watershed. This was determined by analysis of the 2004, one meter resolution, color, aerial photos from the USDA-FSA (see Figure X).

Currently, there is no information, on a Todd's Fork watershed-wide area, of current channel or floodplain condition, floodplain connectivity, riparian levees and condition, number of miles of natural versus maintained channel, length and severity of eroded banks and number of miles of stream are in permanent protection. Each of these characteristics is important to the impact or quality of surface water conditions and

habitat. They will be determined on a case by case basis for riparian and surface water areas that are suffering an impact.

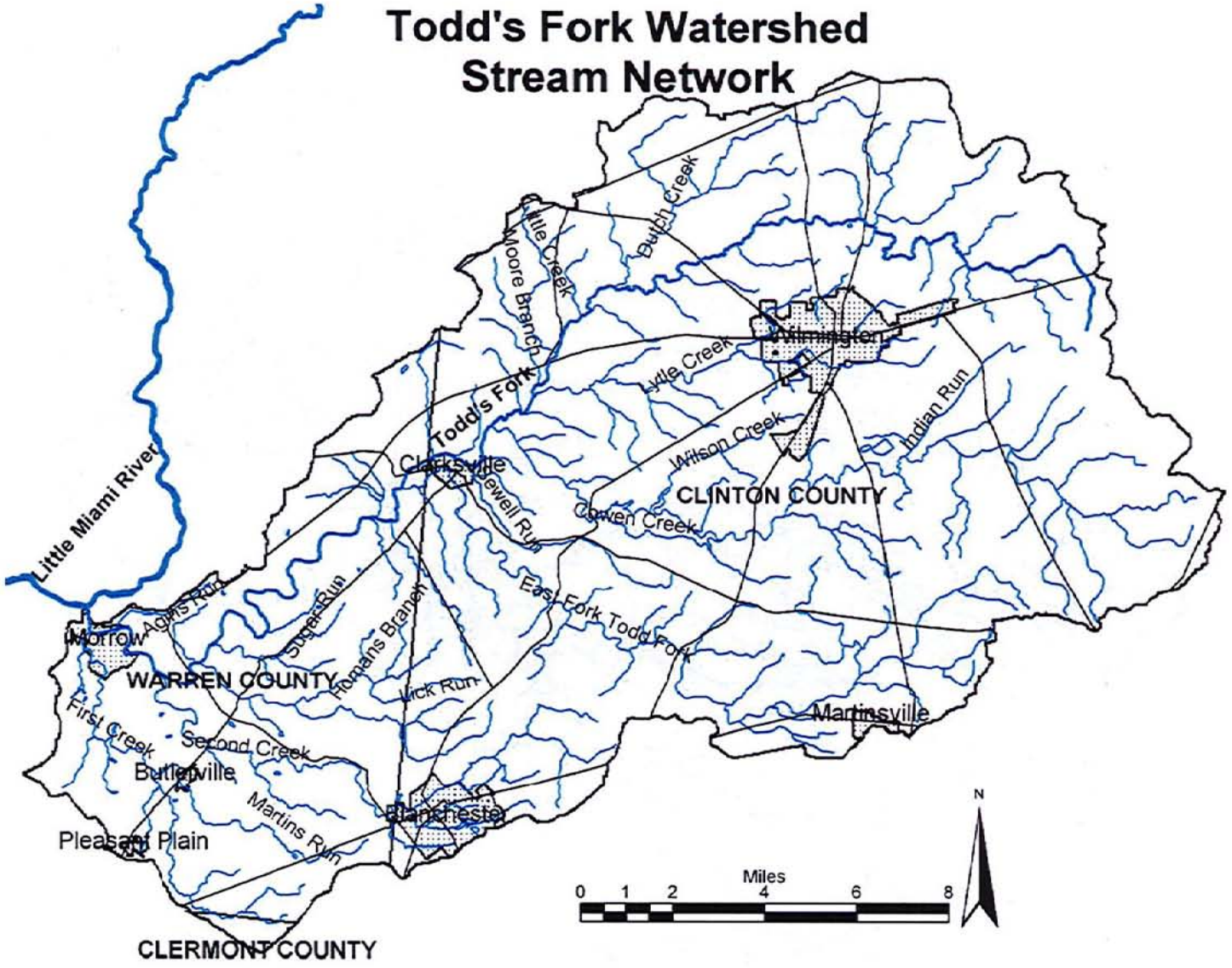

Figure 7. Stream Network of the Todd's Fork Watershed

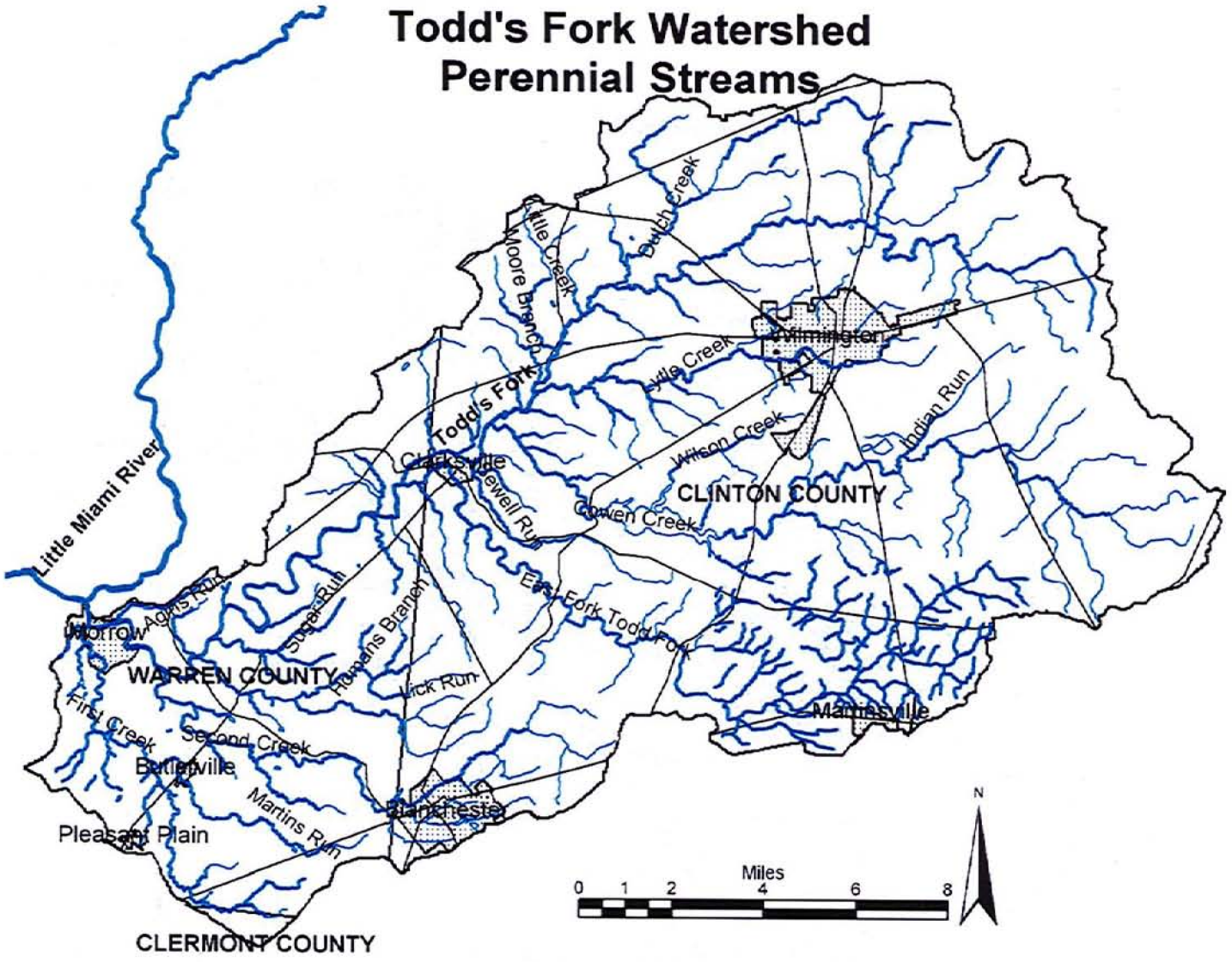

Figure 8. Perennial Streams (Dark Blue) of the Todd's Fork Watershed

Wetlands

There are a number of wetlands throughout the watershed. The National Wetlands Inventory keeps data on these wetlands. Currently, The National Wetlands Inventory does not have complete data coverage for the Todd's Fork watershed that can be used to generate a GIS map.

The most systematic method for understanding where the possibility of wetlands can exist is by evidence of hydric soils in an area. Clinton County has SSURGO-certified soils maps from 2004 that allows for development of a GIS-layer of hydric soils and possible wetland areas. But, Warren County will not receive SSURGO-certified soils maps for the county until late 2005. When this information is available, a complete GIS-layer of possible wetland areas will be generated and added to the report.

The US Fish and Wildlife Department also has a wetlands information publication that covers all of the counties of the Little Miami River watershed.

Any work that occurs on wetlands will need an assessment of wetland quality, which can be determined by USDA-NRCS, SWCD's, or by using the Ohio EPA's 401 Section's Ohio Rapid Assessment Method.

Ground Water

The bedrock aquifers of the Todd's Fork watershed are universally poor. Figure 9 shows that the three main types of bedrock aquifers yield only 0-5 gallons per minute (gpm).

There are 15 different classifications of glacial material in the watershed. The glacial cover is from 25 to 100 feet thick throughout the watershed. Yields differ, but are most often from 5-25 gpm (See Figure 10).

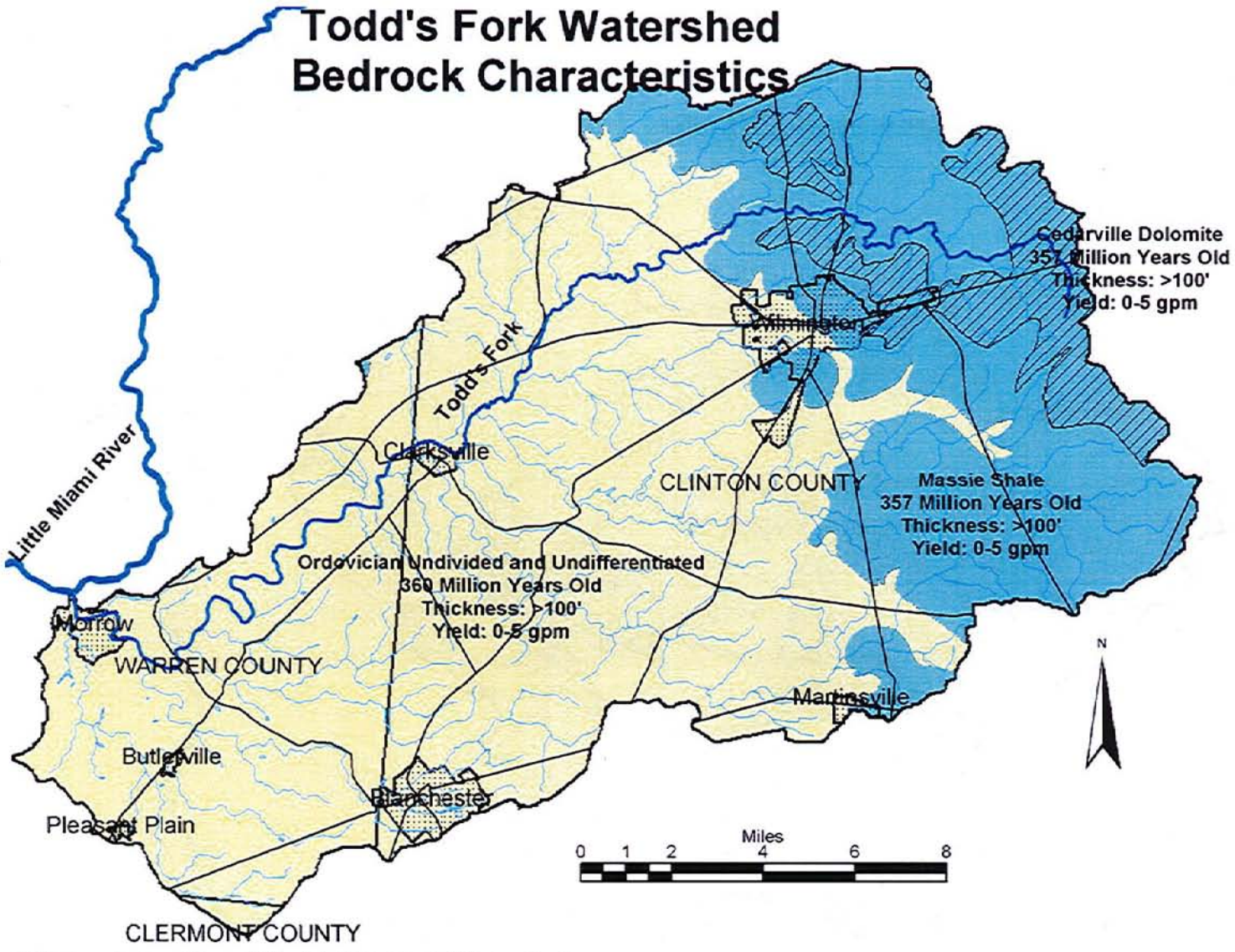

Figure 9. Bedrock Aquifers of the Todd's Fork Watershed

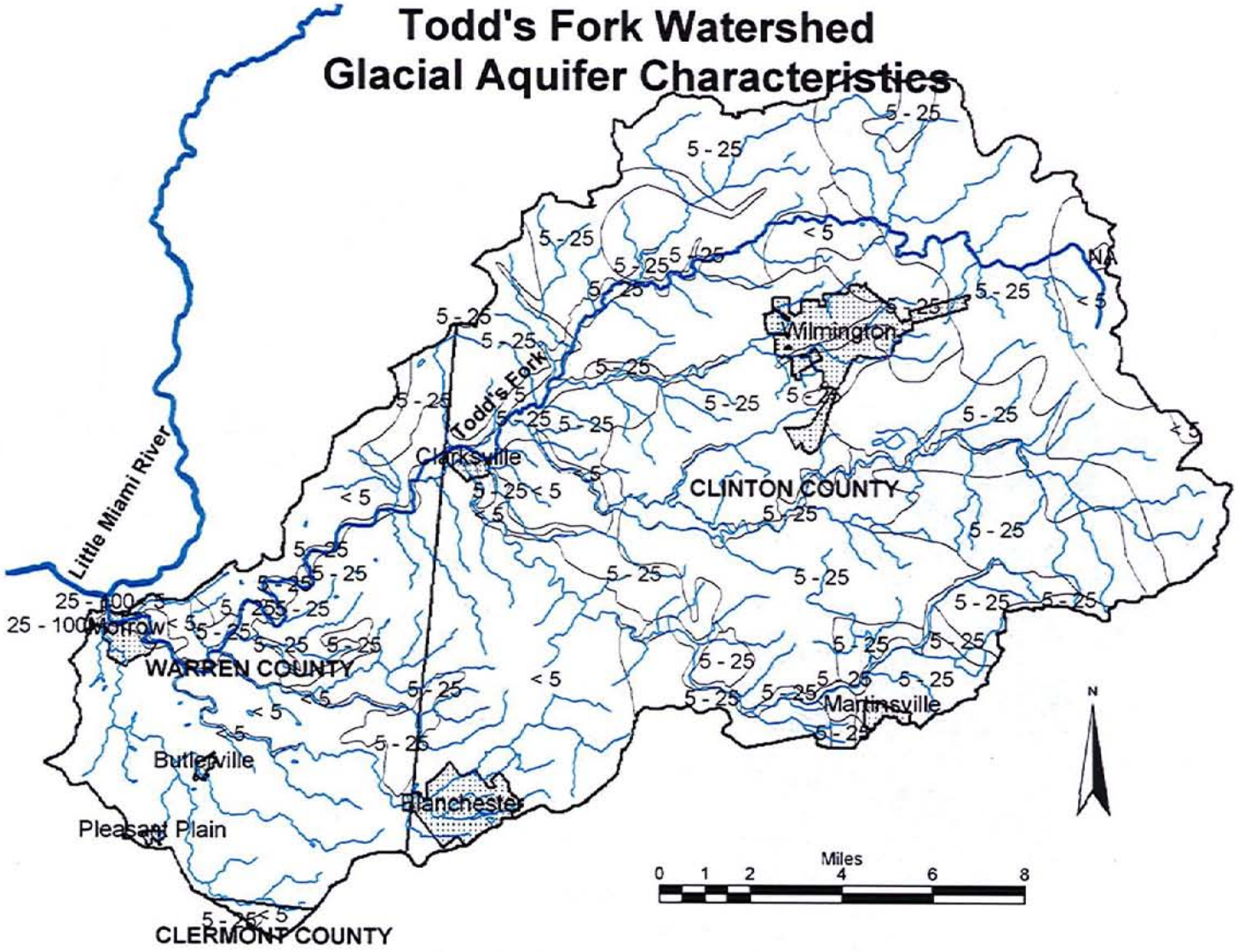

Figure 10. Glacial Aquifer Yields (Gallons Per Minute)

Public Water Supply

The Todd's Fork Watershed has a number of public water supply areas. These include 5 public water supply wells, 2 surface intakes, 2 Source Water Assessment and Protection (SWAP) Program Delineations (Morrow and Wilmington), one SWAP Area (southeast of Wilmington) and one Corridor Management Zone (CMZ)stream (upper part of Cowan's Creek, southeast of Wilmington) (See Figure 11).

Of special note is that the majority of Wilmington's and Clinton County's water supply now comes from surface water intakes located at Caesar's Creek Lake in the Caesar's Creek watershed. This water is then treated, used, and discharged mainly into the Todd's Fork watershed.

Source Water Assessment and Protection (SWAP) areas and delineations are nearly identical in scope. They both represent an area where public water supply, taken from wells, has a voluntary well-head and water supply protection program established.

A Corridor Management Zone (CMZ) is a drainage basin for a surface water intake where special protections are required. These zones have stricter standards for water quality in order to protect the public water supply.

Warren County (25% of the watershed) has a well-head and aquifer protection plan that is part of the county zoning ordinances. Clinton County (75% of the watershed) does not have any type of ground water or aquifer protection plan currently in place.

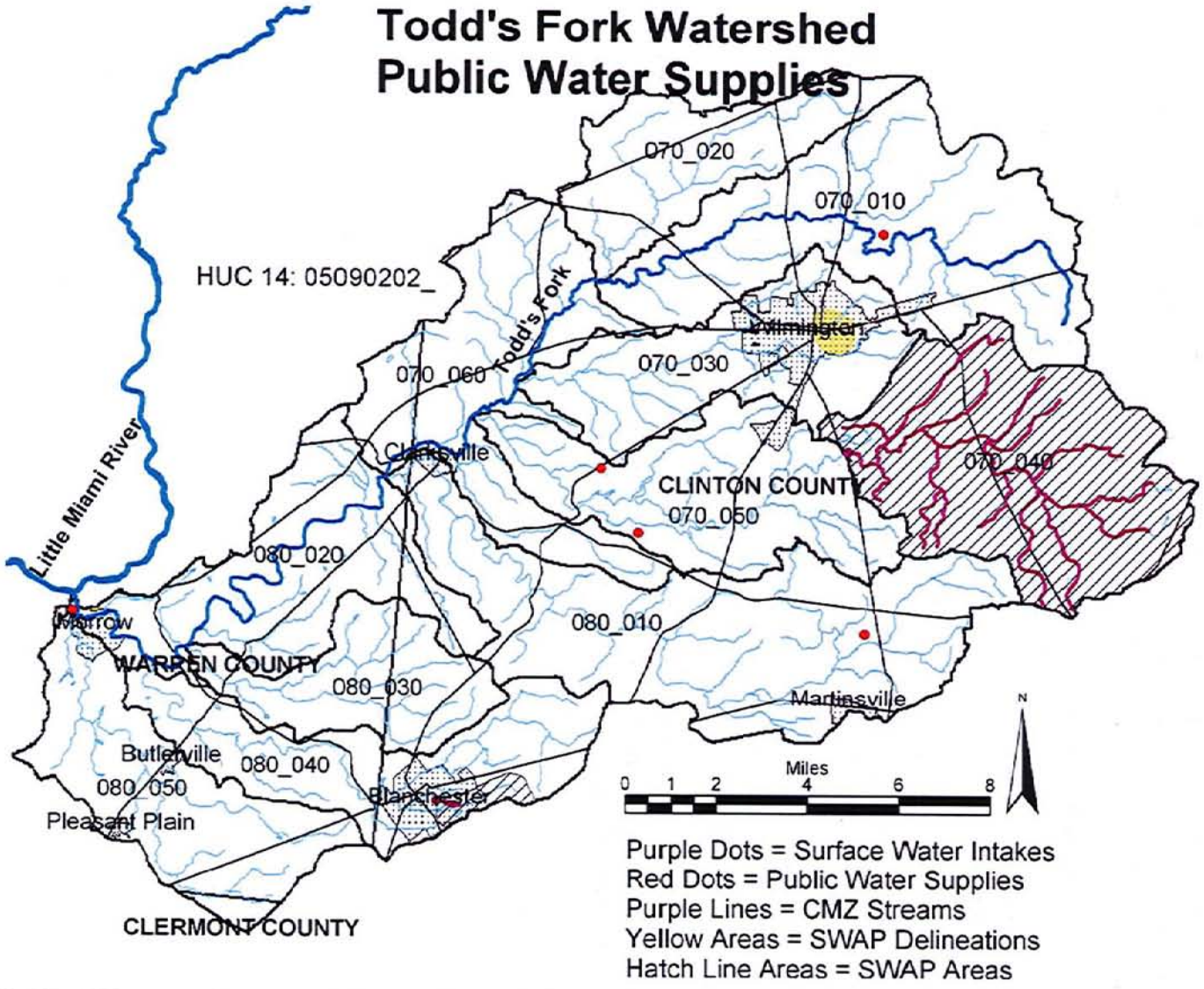

Figure 11. Public Water Supply Areas of the Todd's Fork Watershed

Land Use

Land use has an over-arching effect on environmental conditions in a watershed. The latest, most complete land use data available is from 1992. The last 12 years have seen unprecedented growth and urbanization throughout the watershed. Warren County alone is the second fastest growing county in Ohio (2000 US Census) and Clinton County continues to see drastic changes as the Air Park southeast of Wilmington expands and a new by-pass is being planned for Wilmington (See Figure 12). Because of this, the 1992 land use data is completely out of date for use in this document. In 2005, the USDA released new 2004 one meter resolution, color aerial photos. Therefore, this document will provide aerial photos from 1993 and 2004 for comparative use (See Figures 13 and 14).

There is no current, overall data available for the percent of agricultural land used in the watershed, nor tillage, grazing, crop rotation or chemical use patterns. These factors will be determined at a local level for an area that is suffering from agriculturally related impacts.

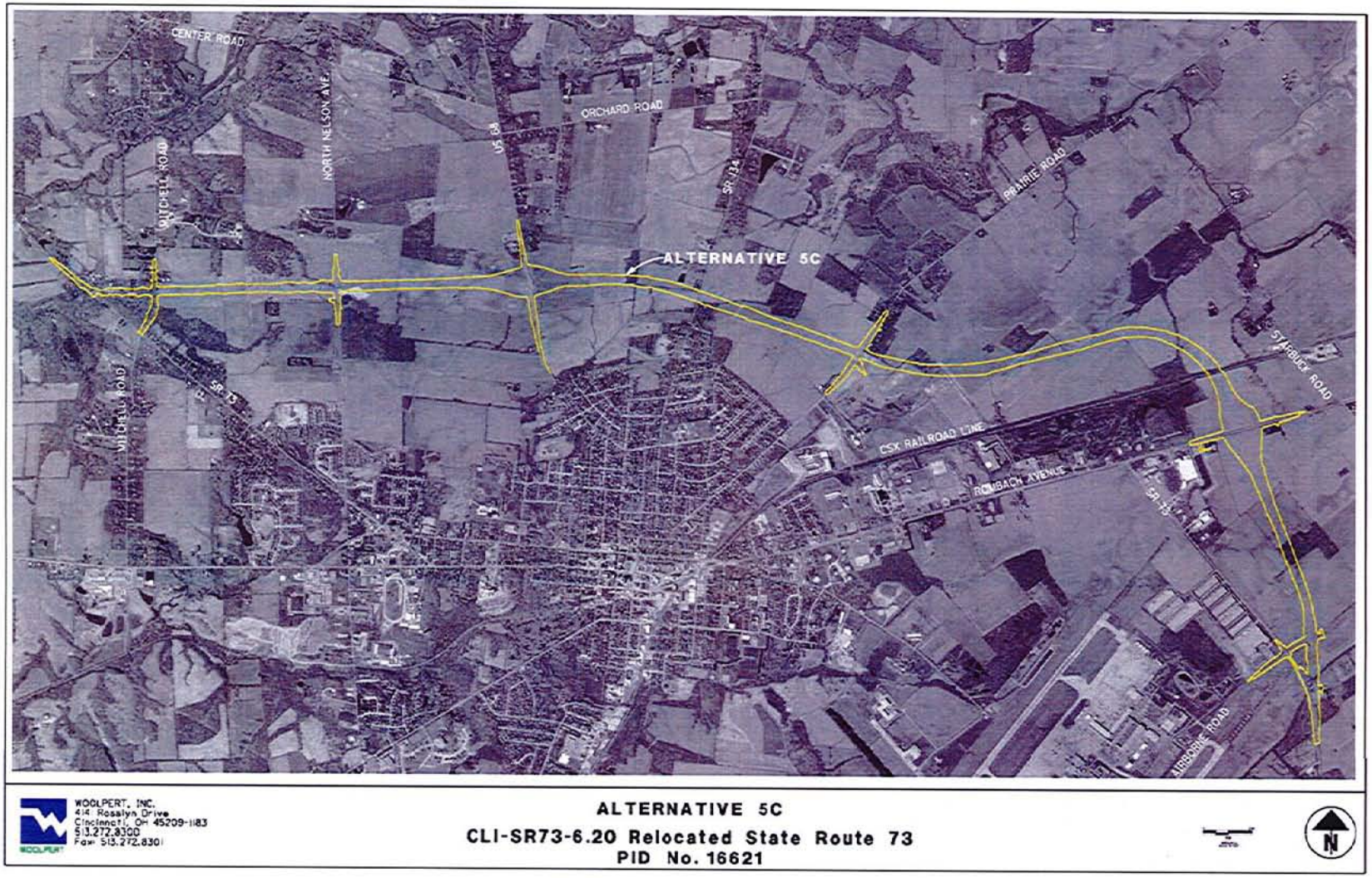

Figure 12. Proposed Wilmington By-Pass

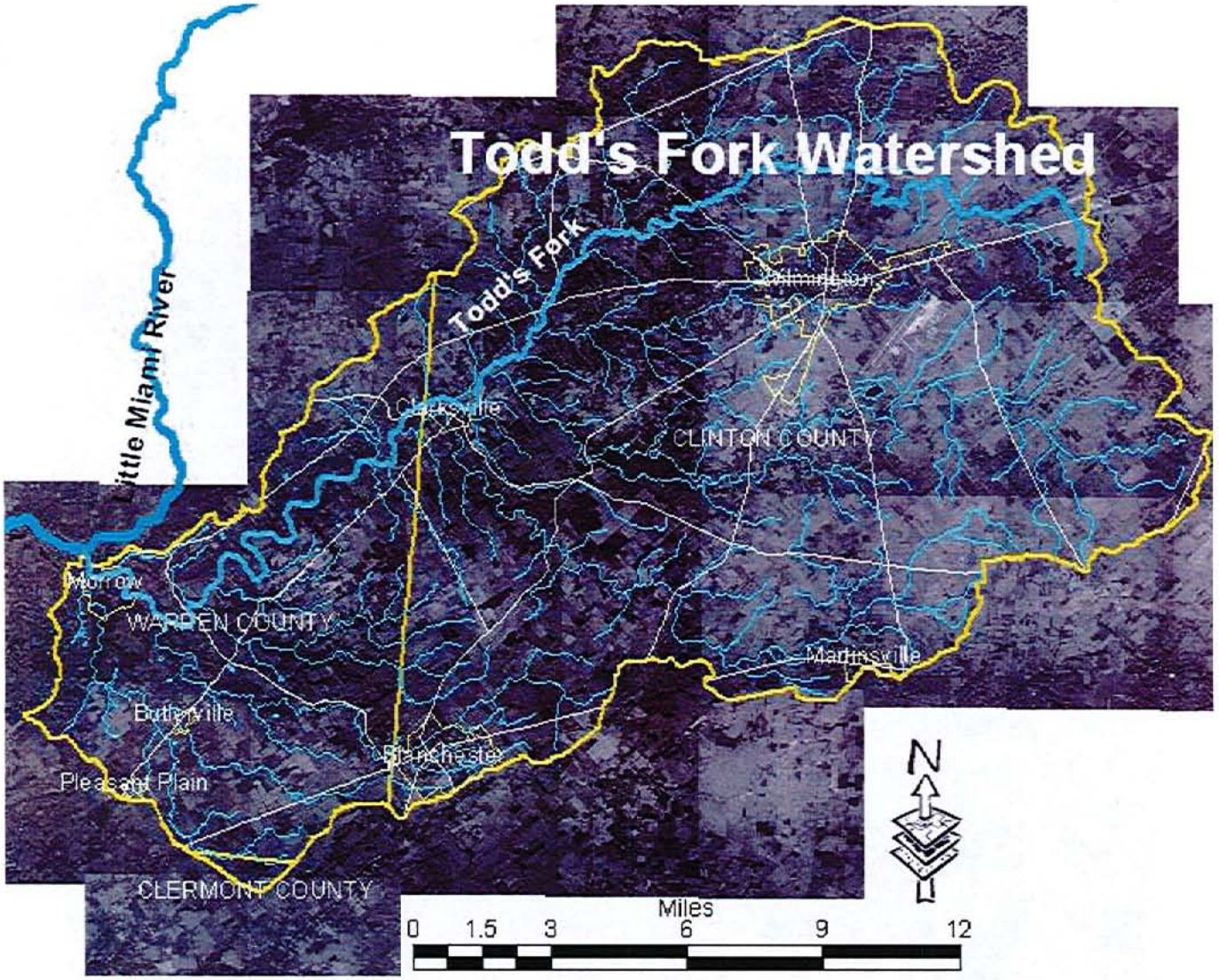

Figure 13. 1993 Aerial Photos of the Todd's Fork Watershed

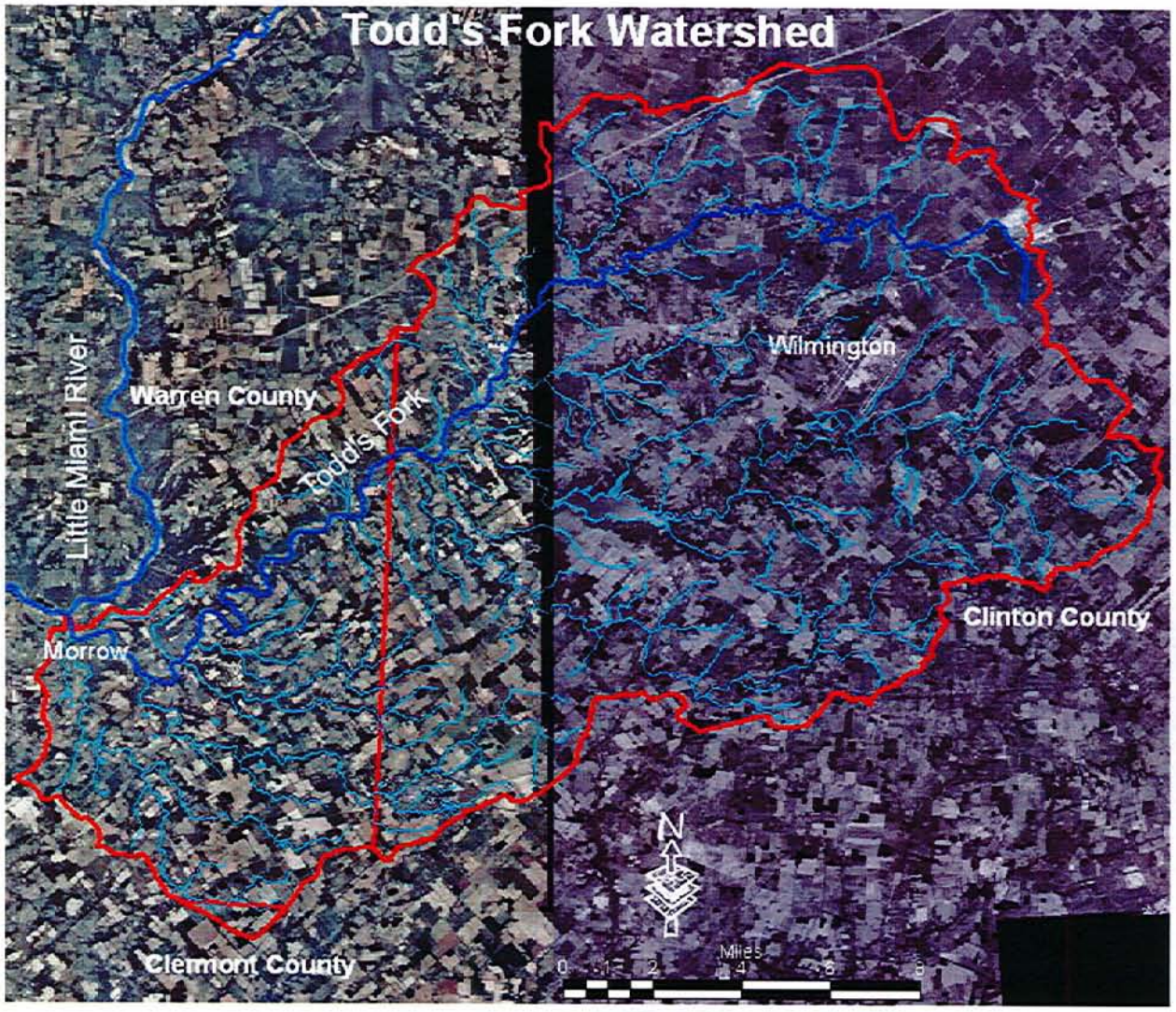

Figure 14. 2004 Aerial Photo's of the Todd's Fork Watershed

Physical Stream Characteristics

This section represents the physical conditions surrounding the streams. Some of these conditions have direct positive and negative impacts on water quality and use-attainability. These conditions are the results of best professional judgments by local professionals.

Upper Todd's Fork (HUC: 070_010) watershed is a mainly flat agricultural area which is about to be impacted by the development of the Wilmington By-Pass. This By-Pass will connect SR73 near Airborne Road to the Air Park, southeast of Wilmington. The SR 73 Bypass will be a four-lane, grade-separated freeway, running North and East of Wilmington and will cross numerous headwater streams for the Todd's Fork watershed. This should cause increased developmental pressures as well as construction damage to the Todd's Fork and its tributaries.

The Dutch Creek (HUC: 070_020) watershed is a primarily flat agricultural area with excellent riparian corridor coverage. The upper section of the Dutch Creek suffers from loss of riparian cover due to poor construction. The intersection of I-71 and Route 68 is rapidly expanding and is suffering from developmental pressures and construction problems. The Wilmington By-Pass via Route 73 will go through the lower end of the watershed which then may suffer from developmental and construction problems.

The Lytle Creek (HUC: 070_030) watershed is a heavily impacted stream system with good riparian cover with its headwaters east of Wilmington and west of the Wilington Air Park. De-icing materials drained into the headwater of the stream effectively killed the stream, and impervious surface runoff, waste water effluent, and entrenchment have made the problem worse. But, over the last five years, ABX has implemented a unique catch-basin design to stop the effluent reaching the creek. This has resulted in some recovery.

The upper Cowan Creek (HUC: 070_040) watershed is a primarily flat agricultural land with significant stream problems. Indian Run was physically relocated to accommodate the growth at the Wilmington Air Park and, prior to 2001, de-icing materials draining into the headwater of the stream effectively killed the stream. But, over the last five years, ABX has implemented a unique catch-basin, wetlands design to stop effluent reaching the creek. The watershed suffers from significant agricultural nutrient loading, canalization, and no riparian cover. The Wilmington By-Pass should cause greater developmental pressures and construction problems.

The lower Cowan Creek (HUC: 070_050) watershed, including Cowan Lake, is a primarily agricultural area. Nutrient loading, caused by poor or failing septic systems affect the water quality of Cowan Lake.

The middle Todd's Fork (HUC: 070_060) watershed is a primarily agricultural area and is in a generally good state.

The East Fork Todd's Fork (HUC: 080_010) watershed is a primarily flat agricultural land. It suffers from nutrient loading from agricultural sources.

The lower Todd's Fork (HUC: 080_020) watershed is a hilly watershed with excellent riparian cover. Some entrenchment of the stream occurs around Morrow.

The Lick Run (HUC: 080_030) watershed is a hilly, transitioning to flat, agricultural area suffering from increased development. Nutrient loading, canalization, animal waste, siltation and loss of riparian cover all cause this watershed to suffer water quality problems.

The Second Creek (HUC: 080_040) watershed represents a hilly, mainly forested area. The streams suffer from Blanchester storm run-off, animal waste, siltation and canalization and loss of riparian cover in the upper watershed areas.

The First Creek (HUC: 080_050) watershed is a primarily hilly agricultural area. Nutrient loading, canalization, animal waste, siltation and loss of riparian cover all cause this watershed to suffer water quality problems.

Home Sewage Treatment Systems

Data on the number and location of home sewage treatment systems for the Todd's Fork watershed is extremely ambiguous, at best. Therefore, all data collected is provided below and not in the HUC 14 sections.

Neither Clinton nor Warren Counties have Home Sewage Treatment System (HSTS) plans approved by the State of Ohio. Since 1989, when records of home sewage treatment systems were started, Warren County has issues over 6,300 permits. In addition, all permitted sewage systems are inspected every year and problems are required to be resolved by the owner.

Clinton County has approximately 4,500 to 5,000 home sewage treatment systems. They have some data on problems and repairs that have taken place, but the county has no inspection and maintenance program. The towns of Midland, Martinsville, Westboro, and Port William have no central sewage system. Clinton County will soon build a central sewer system to serve the Midland, Martinsville, Westboro and Port William area after 2005 and this system will discharge into the East Fork of the Todd's Fork

One-quarter of Warren County and three-quarters of Clinton County lie within the Todd's Fork Watershed. Therefore, approximately 5,100, or more, home sewage treatment systems could be located in the watershed. Further extrapolation of numbers to HUC 14's would be severely inaccurate.

The lower Cowan Creek (HUC: 070_050) watershed, including Cowan Lake, is a primarily agricultural area. Nutrient loading, caused by poor or failing septic systems affect the water quality of Cowan Lake.

The East Fork Todd's Fork (HUC: 080_010) watershed is a primarily flat agricultural land. It suffers from extensive failing home sewage systems around Martinsville. A new waste water treatment plant is being development for Martinsville and should correct that source of nitrification.

The Lick Run (HUC: 080_030) watershed is a hilly, transitioning to flat, agricultural area suffering from increased development. This watershed suffers from poor home sewage treatment functionality due to poor soils.

The Second Creek (HUC: 080_040) watershed represents a hilly, mainly forested area. This watershed suffers from poor home sewage treatment functionality due to poor soils.

The First Creek (HUC: 080_050) watershed is a primarily hilly agricultural area. This watershed suffers from poor home sewage treatment functionality due to poor soils.

Point Source Data

Point source data provides details on known and possible sources of contamination that can directly affect the health of the water system and environment within the watershed. This is a compilation of 30 data sources. Figure 15 shows where these possible contamination sites are located, while Table 5 shows what sources were used to create this information.

The Upper Todd's Fork (HUC: 070_010) watershed has 10 possible contamination and/or point sources. There are 2 known leaking underground tanks, one airport, 2 cemeteries, and 5 handlers or users of toxic materials.

The Dutch Creek (HUC: 070_020) watershed has 8 possible contamination and/or point sources. There are one known leaking underground tank, 4 known non-leaking underground tanks, one airport, and 2 additional sites that falls into other categories.

The Lytle Creek (HUC: 070_030) watershed has 107 possible contamination and/or point sources. There are 33 known leaking underground tanks, 22 non-leaking underground tanks, 2 airports, 1 cemetery, 2 landfills, 1 hospital, 43 handlers or users of toxic materials, and 3 additional sites that fall into other categories.

The Cowan Creek, Upper Section, (HUC: 070_040) watershed has 9 possible contamination and/or point sources. There are 2 known leaking underground tanks, 1 known non-leaking underground tank and 6 handlers or users of toxic materials.

The Dutch Creek (HUC: 070_050) watershed has 14 possible contamination and/or point sources. There are 3 known leaking underground tanks, 3 known non-leaking underground tanks, one cemetery, one land fill, 3 handlers or users of toxic materials, 2 additional sites that falls into other categories, and 1 oil and/or gas well.

The Todd's Fork, Central Stream Section, (HUC: 070_060) watershed has 10 possible contamination and/or point sources. There are 3 known leaking underground tanks, 2 known non-leaking underground tanks, one cemetery, one handler or users of toxic materials, 3 additional sites that falls into other categories, and 1 oil and/or gas well.

The East Fork of the Todd's Fork (HUC: 080_010) watershed has 17 possible contamination and/or point sources. There are 5 known leaking underground tanks, 3 non-leaking underground tanks, one airport, 2 cemeteries, 2 handlers or users of toxic materials, and 4 additional sites that fall into other categories.

The Lower Todd's Fork (HUC: 080_020) watershed has 24 possible contamination and/or point sources. There are 2 known leaking underground tanks, 14 non-leaking underground tanks, 1 airport, 1 cemetery, and 6 handlers or users of toxic materials.

The Lick Run (HUC: 080_030) watershed has 35 possible contamination and/or point sources. There are 12 known leaking underground tanks, 5 known non-leaking

underground tanks, one airport, 4 cemeteries, 10 handlers or users of toxic materials, and 3 additional sites that falls into other categories.

The Second Creek (HUC: 080_040) watershed has 35 possible contamination and/or point sources. There are 12 known leaking underground tanks, 5 known non-leaking underground tanks, one airport, 4 cemeteries, 10 handlers or users of toxic materials, and 3 additional sites that falls into other categories.

The First Creek (HUC: 080_050) watershed has 21 possible contamination and/or point sources. There are 7 known leaking underground tanks, 2 known non-leaking underground tanks, one airport, 7 cemeteries, and 2 handlers or users of toxic materials.

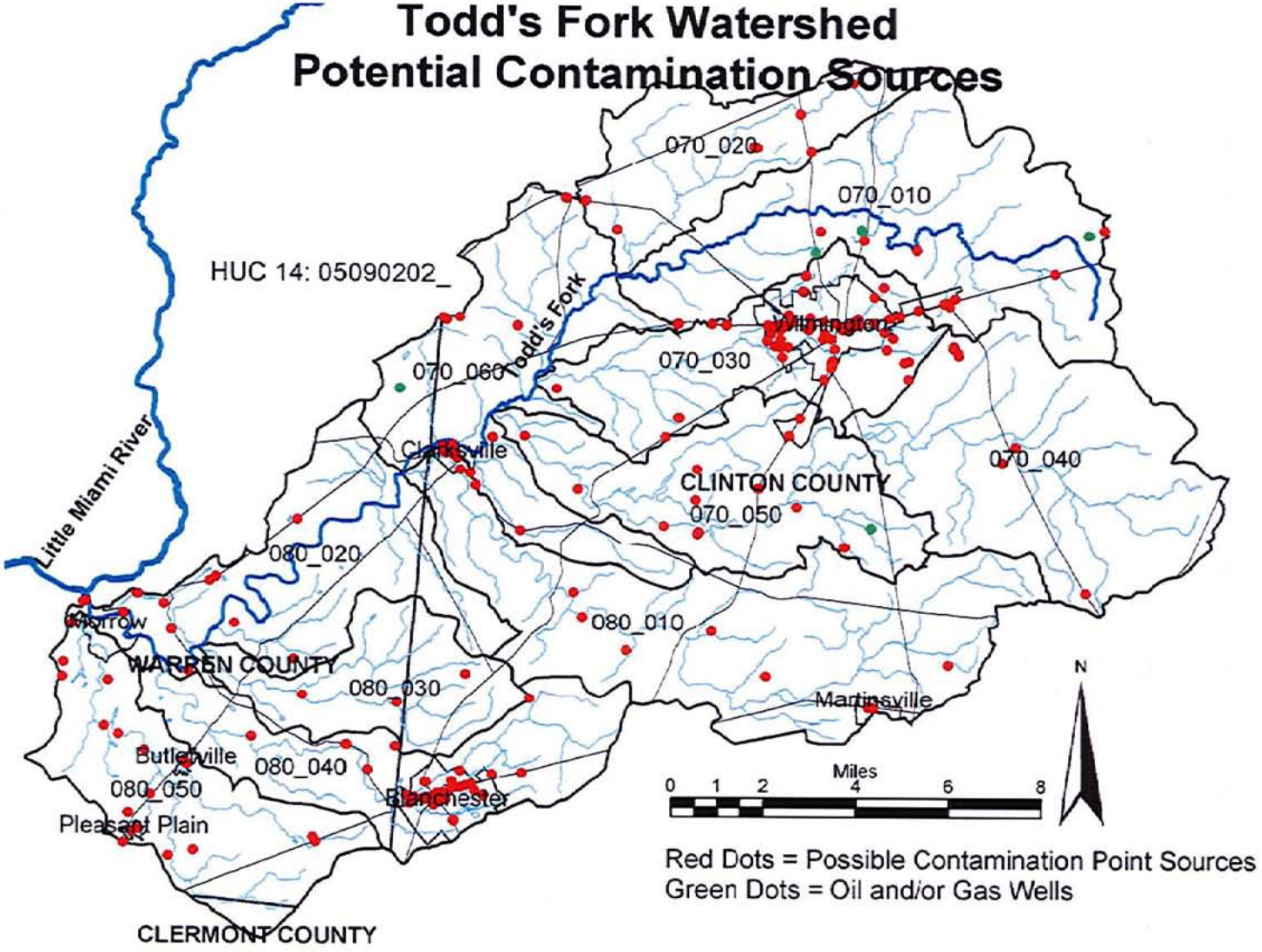

Figure 15. Possible Contamination Sites within the Todd's Fork Watershed

Code	Source Database	Description
R-1	Envirofacts (afs)	Industrial plants which have airborne emissions
R-2	Envirofacts(cerclis)	Superfund database
R-3	Envirofacts(docket)	Actions filed by the US Dept of Justice for USEPA
R-4	Envirofacts(ffis)	All treatment, storage and disposal facilities owned and operated by Federal agencies
R-5	Envirofacts(ncd)	National Compliance Data Base which supports the implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TCSCA)
R-6	Envirofacts(pads)	Facilities which handle PCBs
R-7	Envirofacts(pcs)	National Pollutant Discharge Elimination System (NPDES) permit holding facilities
R-8	Envirofacts(rcris)	Hazardous waste handlers regulated by the US-EPA under the Resource Conservation and Recovery Act
R-9	Envirofacts(ssts)	Pesticide-producing establishments (Section Seven Tracking System)
R-10	Envirofacts(tris)	Facilities which manufacture, process, or import any of over 300 listed toxic chemicals which are released directly into the air, water, or land, or are transported off-site
R-11	msl	Sites under investigation by Ohio EPA's Division of Emergency and Remedial Response
R-12	np	National Priority List. Priority superfund sites (a direct subset of the envirofacts cerclis database).
I-11	ohamlis	Abandoned mine lands
R-13	oilgas	Oil & Gas Wells (operating/abandoned/test holes/etc.)
R-14	uic1	Class 1 wells - deep industrial injection wells
R-15	uic5	Class 5 wells - shallow injection wells, stormwater drainage wells, etc.. There are approximately 50,000 sites in Ohio, HOWEVER, this layer only has about 2,500 points.
A-4	livestock	Combined Animal Feedlots
W-2	lfnew	Construction and demolition debris landfills.
W-4	lfnew	Industrial landfills
W-5	lfnew	Municipal landfills.
W-6	lfnew	Residual waste landfills.
W-3	lfnew/oswfills	Inactive/closed landfills.
W-9	oswfills	Unknown status landfills (most are pre-1968).
R-16	simpound	Surface impoundments.
R-17	tgasites	Town Gas Sites.
(See list)	USGS/ESRI	Hospitals (C-19), Cemetaries (C-8), Airports (C-1)
R-18	LUST dbf	BUSTR regulated leaking underground storage tanks (LUSTs).
R-19	UST dbf	BUSTR regulated underground storage tanks (USTs).
R-20	RIPFLEX	Hazardous waste sites with ground water monitoring information
R-21	multiple dbfs	Sites that are regulated through multiple programs.

Table 5. Potential Contaminant Source Inventory

Storm Water Runoff Data

Storm water runoff data provides information on the amount of impervious surfaces within a specific sub-watershed. As the percentage of total impervious surface area increases versus the area of the watershed, the harder it will be to obtain Full attainment status for the Todd's Fork.

Upper Little Miami River (HUC: 070_010) watershed is a mainly flat agricultural area which is about to be impacted by the development of the Wilmington By-Pass. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The Dutch Creek (HUC: 070_020) watershed is a primarily flat agricultural area with excellent riparian corridor coverage. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The Lytle Creek (HUC: 070_030) watershed is a heavily impacted stream system with good riparian cover with its headwaters east of Wilmington and west of the Wilmington Air Park. Impervious surfaces represent more than 3% of the watershed (much more in the Wilmington area) and cause impacts.

The upper Cowan Creek (HUC: 070_040) watershed is a primarily flat agricultural land with significant stream problems. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The lower Cowan Creek (HUC: 070_050) watershed, including Cowan Lake, is a primarily agricultural area. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The middle Todd's Fork (HUC: 070_060) watershed is a primarily agricultural area and is in a generally good state. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The East Fork Todd's Fork (HUC: 080_010) watershed is a primarily flat agricultural land. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The lower Todd's Fork (HUC: 080_020) watershed is a hilly watershed with excellent riparian cover. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The Lick Run (HUC: 080_030) watershed is a hilly, transitioning to flat, agricultural area suffering from increased development. Impervious surfaces represent less than 1% of the watershed and cause little impact.

The Second Creek (HUC: 080_040) watershed represents a hilly, mainly forested area. Impervious surfaces represent less than 1% of the watershed and cause some impact due to run-off from Blanchester.

The First Creek (HUC: 080_050) watershed is a primarily hilly agricultural area. Impervious surfaces represent less than 1% of the watershed and cause little impact.

Summary of Information

Overall Todd's Fork Watershed

Hydrologic Unit Codes:	2 – 11 Digit HUCS 11 – 14 Digit HUCS
Counties:	Clinton, Clermont, Warren
Phase II Communities:	City of Wilmington
Bedrock:	Universally poor aquifers
Glacial Material:	Over entire region Generally good aquifers
Soils:	Highly diversified with varying characteristics See appropriate soils maps for finer detail
Climate:	Temperate, with well defined seasons
Land Use:	Primarily agriculture Fast growing, population and developmental pressures
Home Sewer Treatment:	No Home Sewer Treatment System Plans

East Fork of the Todd's Fork
HUC: 05090202_080_010

Streams:	East Fork, tributaries
State Resource Water:	None
Bedrock:	0% Cedarville Dolomite 10% Massie Shale 90% Ordovician and Undifferentiated
Glacial Material:	Thin Upland, Complex Thin Upland, End Moraine
Topography:	Hilly with increasing slopes
Endangered Species:	2 Locations
Public Water Supply:	1 Public Water Supply (well)
Physical Stream Character:	Nutrient loading from agricultural sources
Home Sewer Treatment:	Many failing systems around Martinsville, Westboro and Midland. New WWTP should correct the problem and effluent will be release to this stream.
Point Source Data:	17 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Todd's Fork, Lower River Section
HUC: 05090202_080_020

Streams:	Todd's Fork, Agins Run, tributaries
State Resource Water:	None
Bedrock:	0% Cedarville Dolomite 0% Massie Shale 100% Ordovician and Undifferentiated
Glacial Material:	Alluvial and Thin Upland
Topography:	Hilly with increased slopes
Endangered Species:	6 Locations
Public Water Supply:	1 Public Water Supply (well) 1 SWAP Delineation
Physical Stream Character:	Excellent riparian cover Some entrenchment
Home Sewer Treatment:	No currently known impacts
Point Source Data:	24 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Lick Run
HUC: 05090202_080_030

Streams:	Lick Run, Sugar Run, Homan's Branch, tributaries
State Resource Water:	Lick Run
Bedrock:	0% Cedarville Dolomite 0% Massie Shale 100% Ordovician and Undifferentiated
Glacial Material:	Alluvial and Thin Upland
Topography:	Flatter with increasing slopes near streams
Endangered Species:	None
Public Water Supply:	None
Physical Stream Character:	Loss of riparian cover, nutrient loading, canalization, animal waste, siltation
Home Sewer Treatment:	Poor soils for home sewer treatment systems
Point Source Data:	35 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Second Creek
HUC: 05090202_080_040

Streams:	Second Creek, Marin's Run, tributaries
State Resource Water:	None
Bedrock:	0% Cedarville Dolomite 0% Massie Shale 100% Ordovician and Undifferentiated
Glacial Material:	Alluvial and Thin Upland
Topography:	Flatter with increasing slopes near streams
Endangered Species:	1 Location
Public Water Supply:	1 Surface Water Intake 1 SWAP Area
Physical Stream Character:	Loss of riparian cover, nutrient loading, canalization, animal waste, siltation
Home Sewer Treatment:	Poor soils for home sewer treatment systems
Point Source Data:	35 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces, more in Blanchester

First Creek
HUC: 05090202_080_050

Streams:	First Creek, tributaries
State Resource Water:	None
Bedrock:	0% Cedarville Dolomite 0% Massie Shale 100% Ordovician and Undifferentiated
Glacial Material:	Thin Upland
Topography:	Hilly with increased slopes
Endangered Species:	1 Location
Public Water Supply:	None
Physical Stream Character:	Loss of riparian cover, nutrient loading, canalization, animal waste, siltation
Home Sewer Treatment:	Poor soils for home sewer treatment systems
Point Source Data:	21 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Todd's Fork, Upper River Section
HUC: 05090202_070_010

Streams:	Todd's Fork, tributaries
State Resource Water:	None
Bedrock:	40% Cedarville Dolomite 40% Massie Shale 20% Ordovician and Undifferentiated
Glacial Material:	Thin Upland and Grand Moraine
Topography:	Flatter with increasing slopes near streams
Endangered Species:	None
Public Water Supply:	1 Public Water Supply (well)
Physical Stream Character:	Increasing developmental pressures could cause problems
Home Sewer Treatment:	No currently known impacts
Point Source Data:	10 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Dutch Creek
HUC: 05090202_070_020

Streams:	Dutch Creek, tributaries
State Resource Water:	None
Bedrock:	20% Cedarville Dolomite 40% Massie Shale 40% Ordovician and Undifferentiated
Glacial Material:	Grand Moraine
Topography:	Flatter with increasing slopes near streams
Endangered Species:	None
Public Water Supply:	None
Physical Stream Character:	Increasing developmental pressures could cause problems
Home Sewer Treatment:	No currently known impacts
Point Source Data:	8 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Lytle Creek
HUC: 05090202_070_030

Streams:	Lytle Creek, tributaries
State Resource Water:	None
Bedrock:	10% Cedarville Dolomite 30% Massie Shale 60% Ordovician and Undifferentiated
Glacial Material:	Thin Upland
Topography:	Hilly with increased slopes
Endangered Species:	4 Locations
Phase II Communities:	City of Wilmington
Public Water Supply:	1 SWAP Delineation 1 City of Wilmington Water Processing Plant, for water from Caesar's Creek
Physical Stream Character:	Good Riparian Cover Heavily impacted but City of Wilmington and ABX Airport Developmental pressures could cause further problems
Home Sewer Treatment:	No currently known impacts
Point Source Data:	107 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Greater than 3% impervious surfaces

Cowan Creek, Upper Stream Section
HUC: 05090202_070_040

Streams:	Cowan Creek, Indian Run, tributaries
State Resource Water:	Cowan Creek
Bedrock:	10% Cedarville Dolomite 80% Massie Shale 10% Ordovician and Undifferentiated
Glacial Material:	Thin Upland, Complex, and Grand Moraine
Topography:	Flatter with increasing slopes near streams
Endangered Species:	None
Public Water Supply:	Entire HUC is a SWAP Area All streams in HUC are CMZ streams 1 Surface Water Intake
Physical Stream Character:	Sever impacts from chemicals from ABX Airport Nutrient Loading, canalization, and no riparian cover
Home Sewer Treatment:	No currently known impacts
Point Source Data:	9 possible contamination and/or point
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Cowan Creek, Lower Stream Section (including Cowan Lake)
HUC: 05090202_070_050

Streams:	Cowan Creek, Wilson Creek, tributaries
State Resource Water:	Cowan Creek
Bedrock:	0% Cedarville Dolomite 10% Massie Shale 90% Ordovician and Undifferentiated
Glacial Material:	Thin Upland, Complex, and Alluvial
Topography:	Hilly with increased slopes
Endangered Species:	5 Locations
Public Water Supply:	2 Public Water Supplies (well)
Physical Stream Character:	No currently known impacts
Home Sewer Treatment:	Nutrient loading of Cowan Lake by local failing home sewer systems
Point Source Data:	14 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

Todd's Fork, Central Stream Section
HUC: 05090202_070_060

Streams:	Cowan Creek, Wilson Creek, Sewell Run, tributaries
State Resource Water:	Cowan Creek
Bedrock:	0% Cedarville Dolomite 1% Massie Shale 99% Ordovician and Undifferentiated
Glacial Material:	Thin Upland, Complex, and Grand Moraine
Topography:	Hilly with increased slopes
Endangered Species:	3 Locations
Public Water Supply:	None
Physical Stream Character:	Generally good riparian cover
Home Sewer Treatment:	No currently known impacts
Point Source Data:	10 possible contamination and/or point sources
Spills Data:	
Storm Water Runoff Data:	Less than 1% impervious surfaces

CHAPTER 3: WATER RESOURCE QUALITY

Introduction

This section of the Watershed Action Plan covers all of the data currently available, from the OEPA, to evaluate the physical quality and characteristics of the water systems in the Todd's Fork Watershed. This includes Use Attainment Status, the Ohio Water Resources Inventory 305(b) data, Ohio EPA Biological Sampling data and Ohio EPA Chemical Sampling data, and various other State and Federal publications. This data will be presented by 14-digit HUC watersheds. A quick overview of each of the above data sets will be covered below.

Use Attainment Status

The 1972 Clean Water Act and amendments require that all US waters meet a fishable/swimmable use-attainment status. In other words, all waters must be able to be fished in and swum in.

In application, the State of Ohio determines use-attainment status by the biological capacity of the water system. Streams and rivers must attain at least a Warm Water Habitat designation. A water system is considered in Full Attainment if it meets certain numeric values for the Invertebrate Community Index (ICI), the Index of Biotic Integrity (IBI), Index of Well-Being (IWB2), and the Quality Habitat and Environment Index (QHEI) (these Indices are describe in more detail below). A water system is considered to be in Partial-Attainment if it does not meet one or more of the required indices values, but obtains at least one of the values. Non-Attainment means the water system did not met any of the required values of any of the indices.

This information is represented in Figure 16 and Figure 17.

The Ohio Water Resources Inventory 305(b) Report

The Ohio Water Resources Inventory 305(b) report, authored by Ohio EPA, provides data on the Use-Attainment Status of particular stream sections and the most likely causes of the impairments. This report is represented in Figure 18.

Biological and Water Quality Study of the Little Miami River Basin

This report, OEPA Technical Report (Number MAS/1999-12-3), presents the Use-Attainment Status and conditions specifically for the Little Miami River. It also provides details on the most likely causes of impairments. This report is represented in Figure 19.

Ohio Biological Sampling Data

Ohio's Biological Sampling Data provides details on each sampling location and the actual scores for the ICI, IBI, IWB2, and QHEI. The Invertebrate Community Index (ICI)

measures and quantifies the health of the invertebrate community within an area. The Index of Biotic Integrity (IBI) measures and quantifies the species diversity of fish populations in a water system. The Index of Well-Being (IWB2) also measures and quantifies the health of fish populations, but focuses on the number of individual fish present, not just the number of species. The Quality Habitat and Environment Index (QHEI) measures and quantifies the physical habitat of the riparian and lotic (in-stream) areas of a stream section. It provides details on the capacity of the environment within an area to sustain biological communities. The higher the score of any index, the better the health of that particular sampling area. All sampling sites are represented in Figure 20, while those used for analysis (10 years or younger data sets) are represented in Figure 21.

Ohio Chemical Sampling Data

The State of Ohio's chemical sampling data provides basic chemical characteristics for a given site at a given time. Sites were sampled for water temperature (degrees Celsius), flow rate (cubic feet per second), dissolved oxygen (DO), biological oxygen demand (BOD5), chemical oxygen demand (COD), pH-field, pH-lab, alkalinity, total solids, total suspended solids (TSS), oil/grease, ammonia, nitrite, total concentration of nitrogen (TKN), nitrate, phosphorous, total organic carbon (TOC), cyanide, hardness, calcium, magnesium, sodium, potassium, chlorine, sulfate, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, nickel, strontium, zinc, aluminum, fecal coliform, fecal strep, phenolics, and total dissolved solids (TDS).

To analyze these data, values were compared to Ohio EPA's accepted requirements for the protection of aquatic life, agricultural-use requirements, human drinking water standards, watershed-wide normal median values and proposed (but not yet accepted) requirements for the protection of aquatic life. Since each standard covers different chemicals, by using all of the standards as a comparison all the chemical data could be analyzed.

Table 6 summarizes the chemical parameters sampled, if the sample exceeded one or more or the standards, what standards were used, and the standard level.

Although there is a tremendous amount of Ohio EPA chemical data available from various sites throughout the watershed, most of the data is historical in nature (over 10 years of age). Since this report is looking at the possible impacts of current chemicals only data from the previous 10 years has been used. Figure 22 shows all the possible Ohio EPA chemical sampling sites in the Todd's Fork Watershed, while Figure 23 shows what sites were used for this report.

Those contaminants that exceed the Aquatic Life Standards are represented in Figure 24 and Figure 25.

USGS Circular 1229 – Water Quality in the Great and Little Miami River Basins, Ohio and Indiana, 1999-2001.

This report was reviewed and there was no specific data or information provided that pertained directly to the Todd's Fork Watershed.

ODNR Stream Quality Monitoring Project – Ohio Scenic Rivers Program, Statewide Summary (1996)

This report was reviewed and there was no specific data or information provided that pertained directly to the Todd's Fork Watershed.

ODNR Ohio Scenic Rivers Program Stream Quality Monitoring Project, 1999 Annual Report

This report was reviewed and there was no specific data or information provided that pertained directly to the Todd's Fork Watershed.

Abbr	Name	Standard Used	Standard Level
DO	Dissolved Oxygen	Aquatic	4.0 (Habitat Dependent)
Pb	Lead	Aquatic	230 (Hardness Dependent)
Phenolics	-	Aquatic	1 (Chemical Dependent)
SR	Strontium	Aquatic	770
P	Phosphorus	Proposed Aquatic	0.05 (IBI Dependent)
TotN	Total Nitrogen	Proposed Aquatic	1.0 (Habitat Dependent)
Na	Sodium	Drinking Water	1000
As	Arsenic	Drinking Water	0.05
Ba	Barium	Drinking Water	2
Cd	Cadmium	Drinking Water	0.005
Cr	Chromium	Drinking Water	0.1
Ni	Nickel	Drinking Water	0.01
Nitrates	Nitrates	Drinking Water	10
Mn	Magnesium	LMR Median Value	41
Al	Aluminum	LMR Median Value	336
COD	Chemical Ox. Demand	LMR Median Value	10
TOC	Total Organic Carbon	LMR Median Value	5
BOD5	Biological Ox. Demand	LMR Median Value	2
TDS	Total Dissolved Solids	-	1000 (equals brine)

Table 6. Chemical and Exceeded Standards in the Todd's Fork Watershed

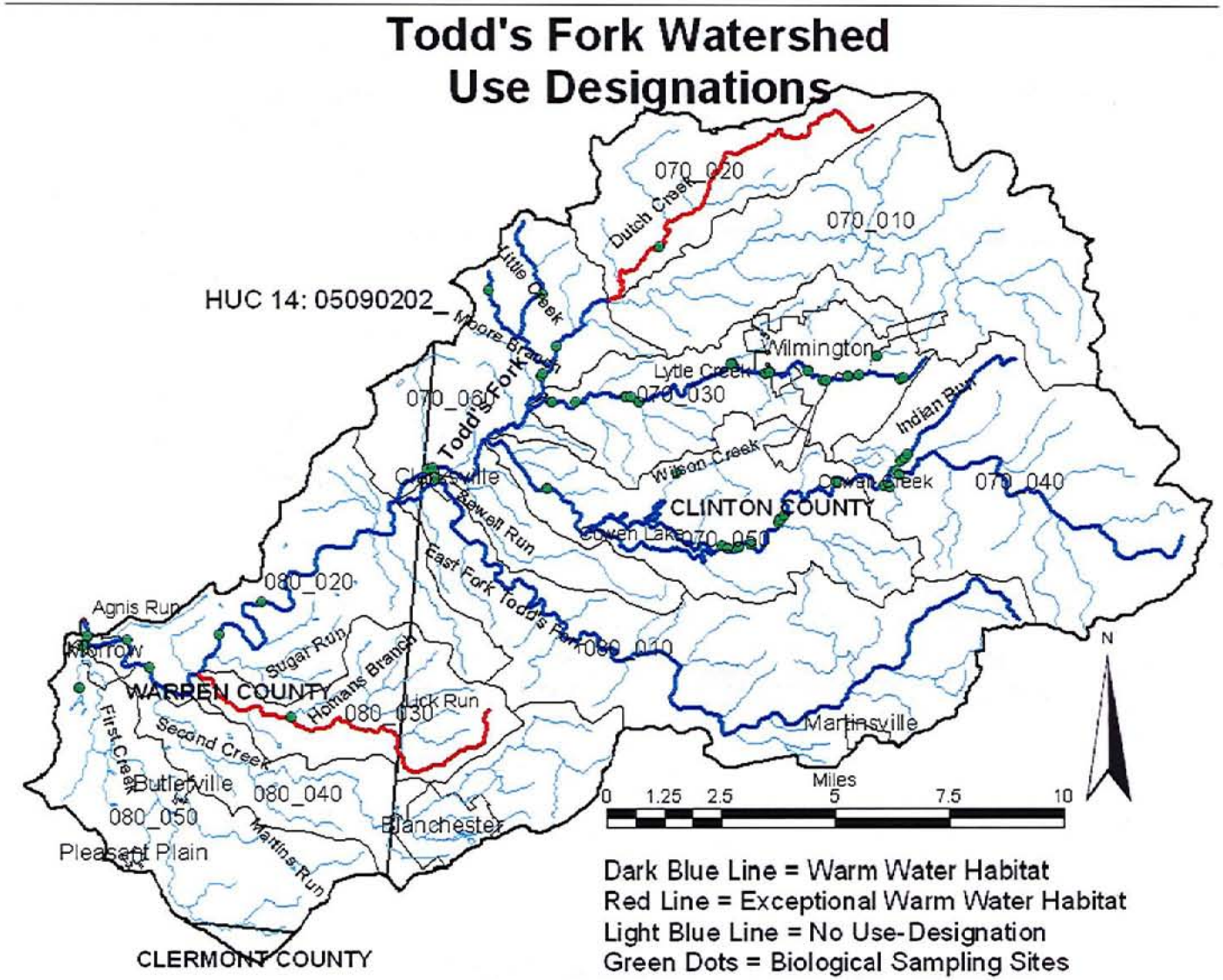

Figure 16. Use-Designations of Streams in the Todd's Fork Watershed

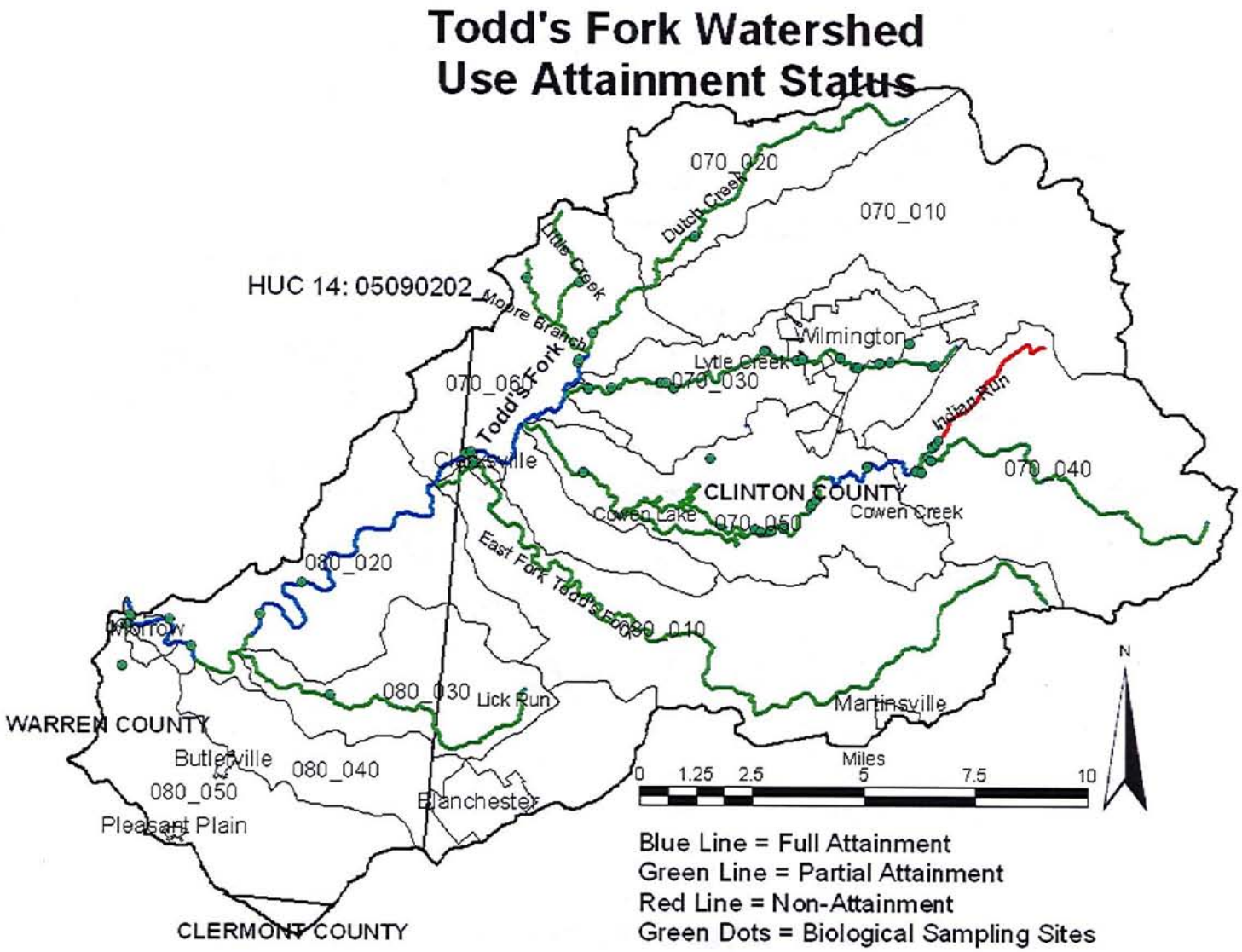

Figure 17. Use-Attainment Status of Water Bodies in the Todd's Fork Watershed

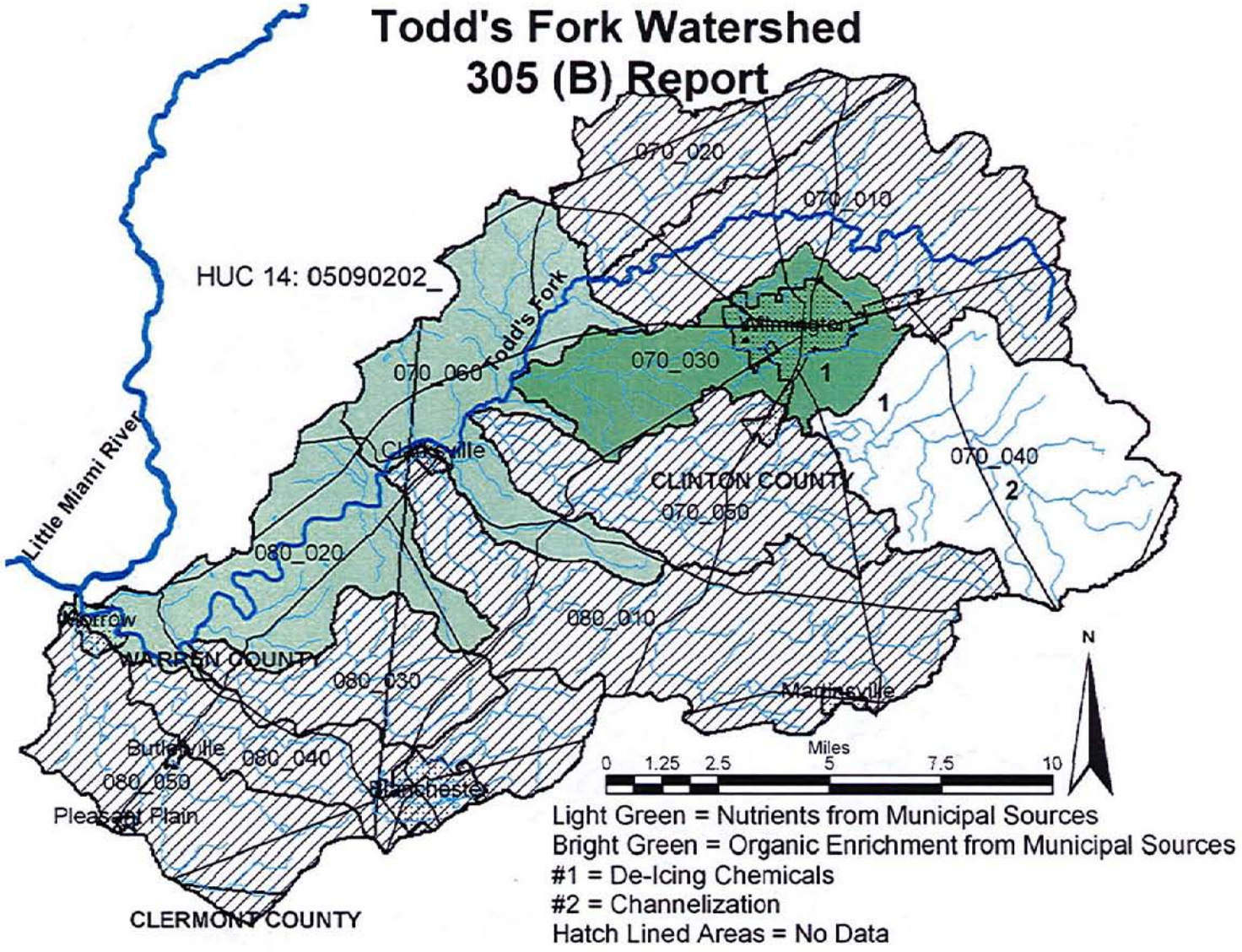

Figure 18. OEPA 503 (b) Report on the Little Miami River Watershed (2002) -- Todd's Fork Watershed

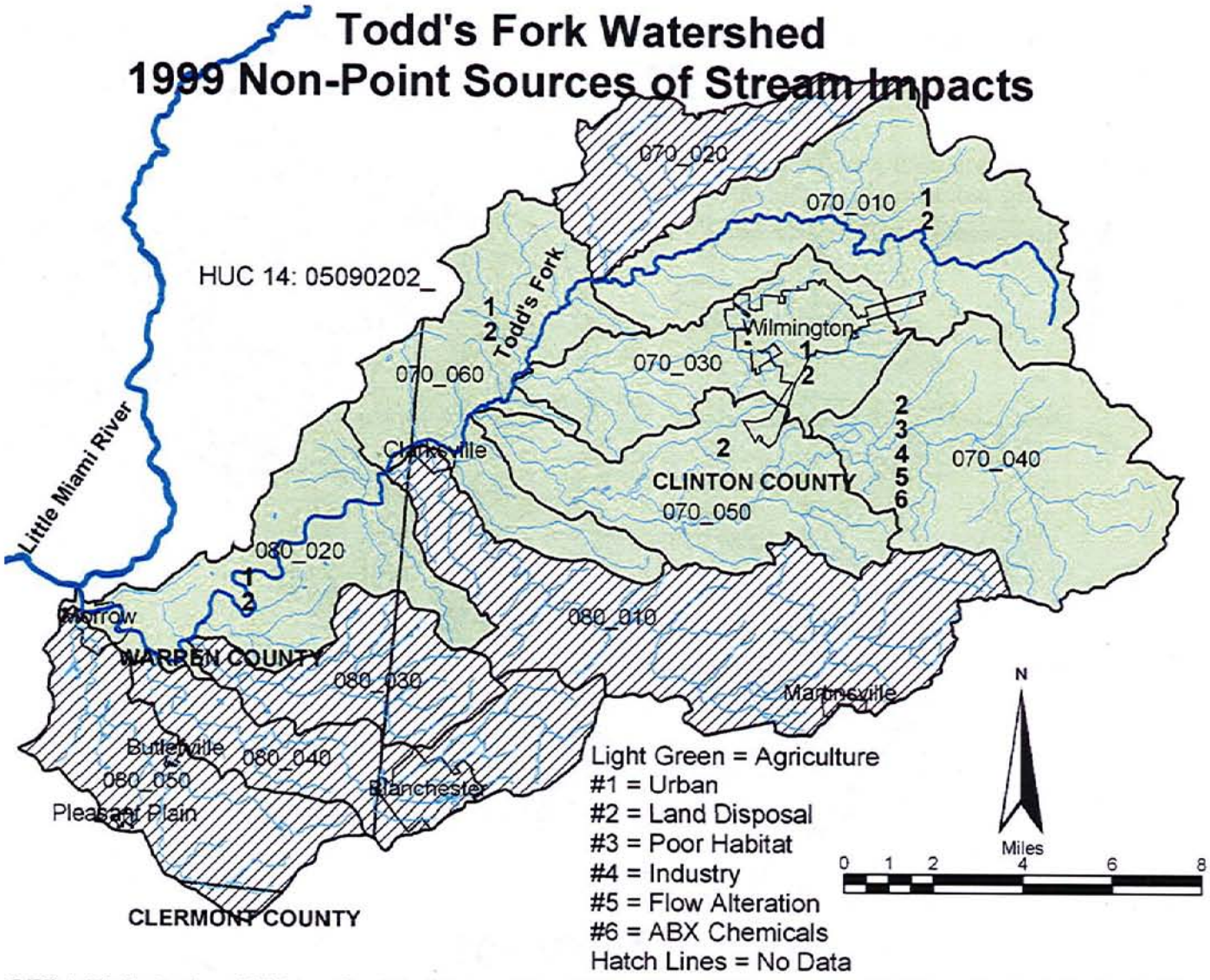

Figure 19. OEPA Biological and Water Quality Study of the Little Miami River Basin (1999) -- the Todd's Fork Watershed

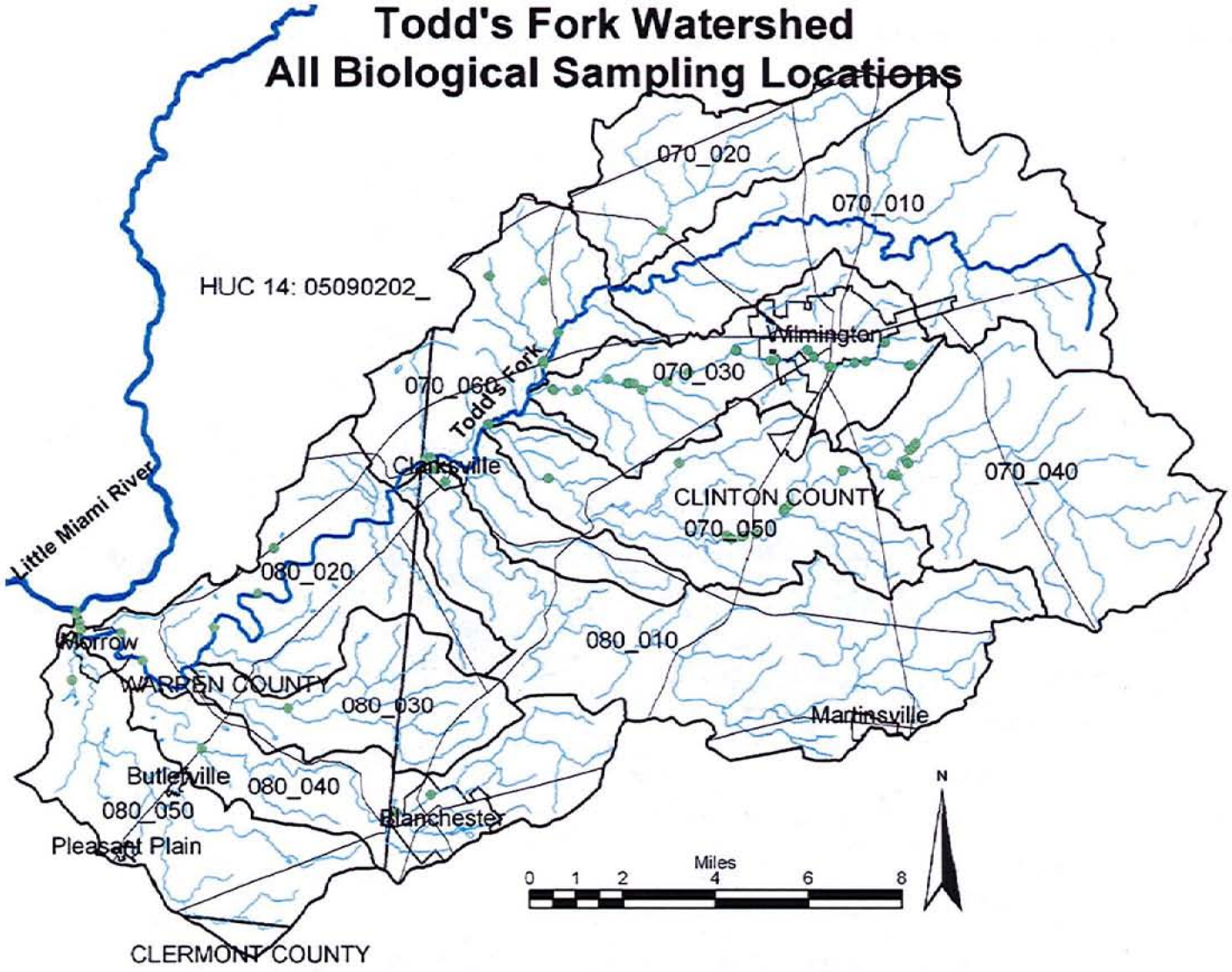

Figure 20. All Possible OEPA Biological Sampling Sites within the Todd's Fork Watershed

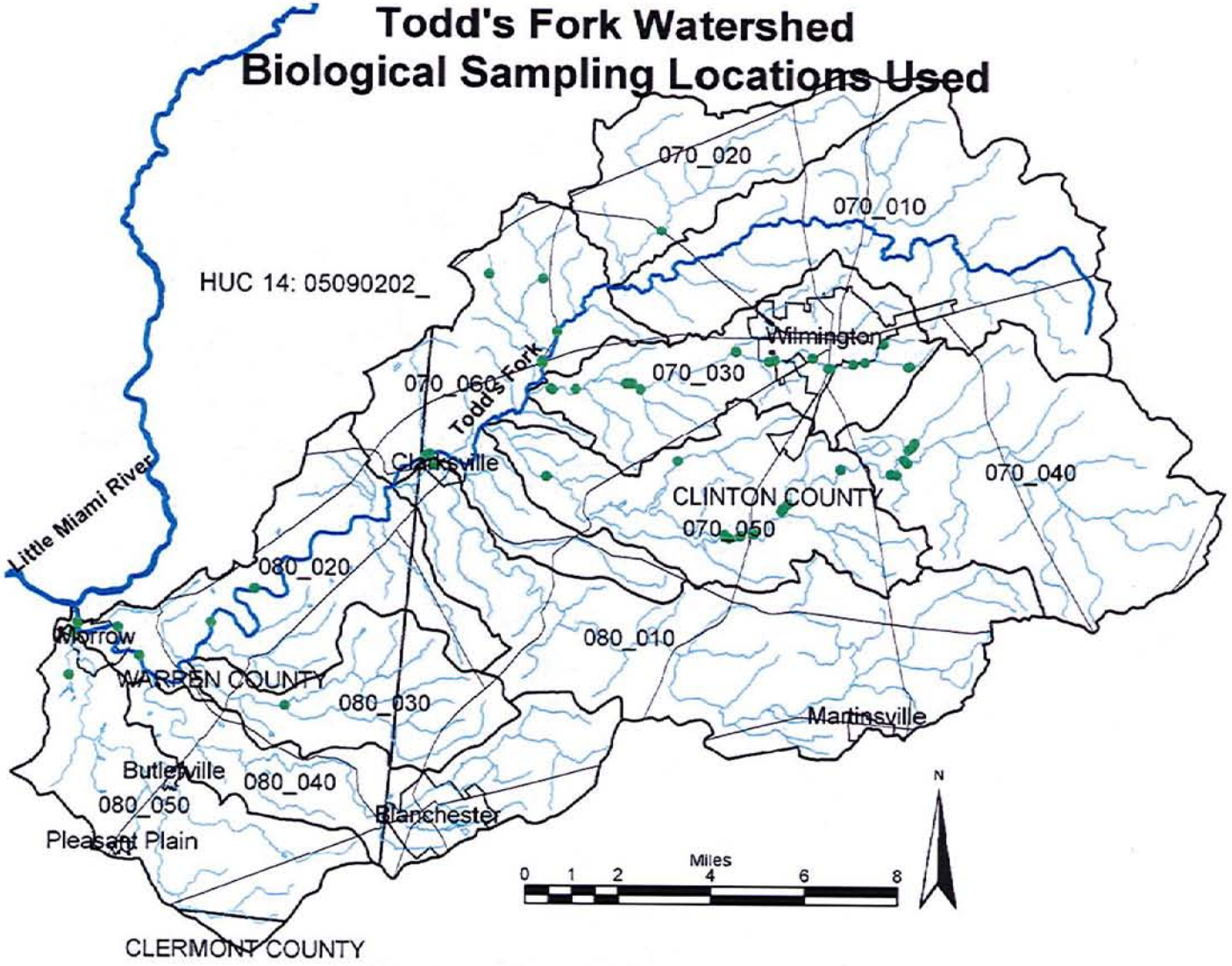

Figure 21. OEPA Biological Sampling Sites Used for the Todd's Fork Watershed Action Plan (data less than 10 years old)

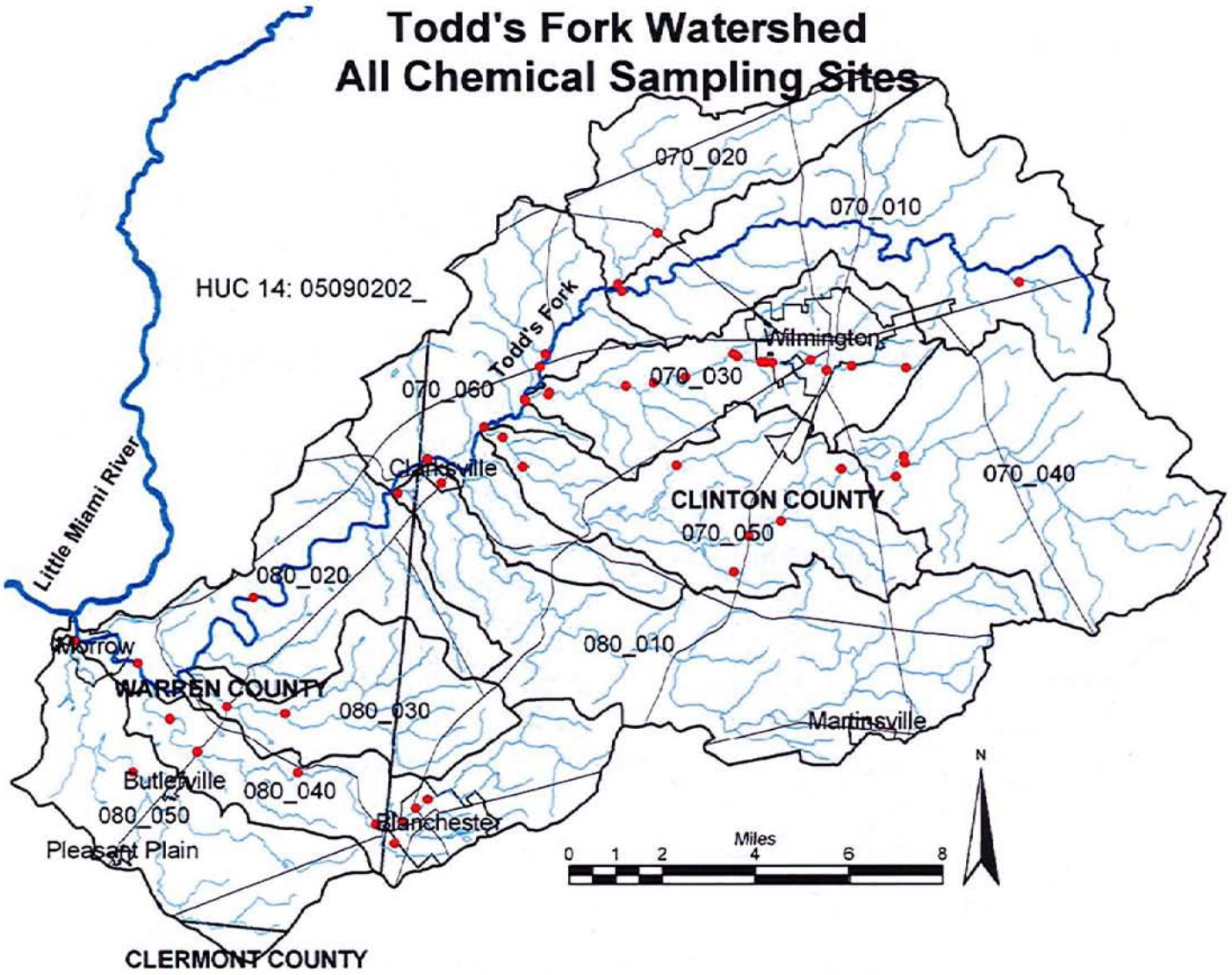

Figure 22. All Possible OEPA Chemical Sampling Sites within the Todd's Fork Watershed

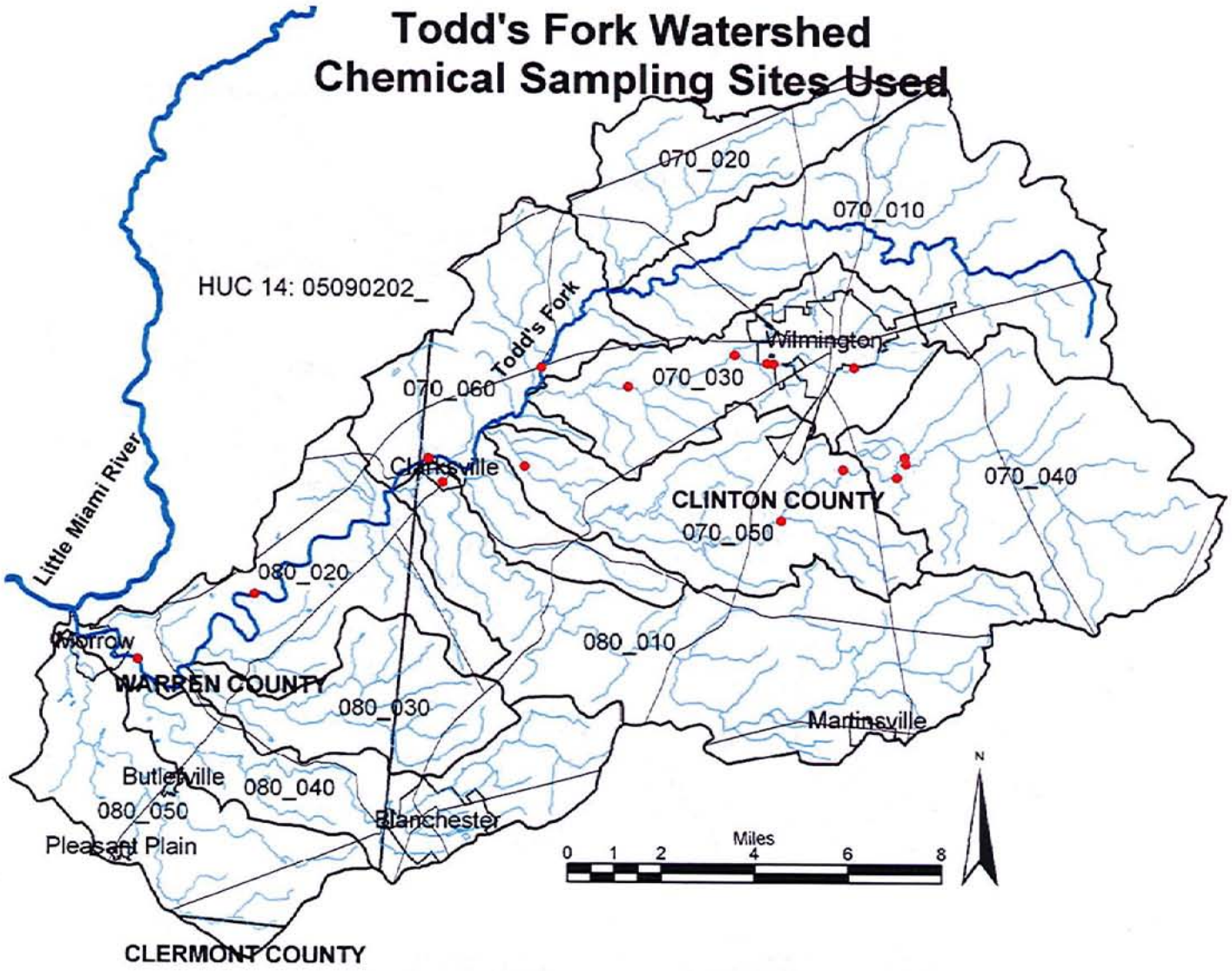

Figure 23. OEPA Chemical Sampling Sites Used for the Todd's Fork Watershed Action Plan (data less than 10 years old)

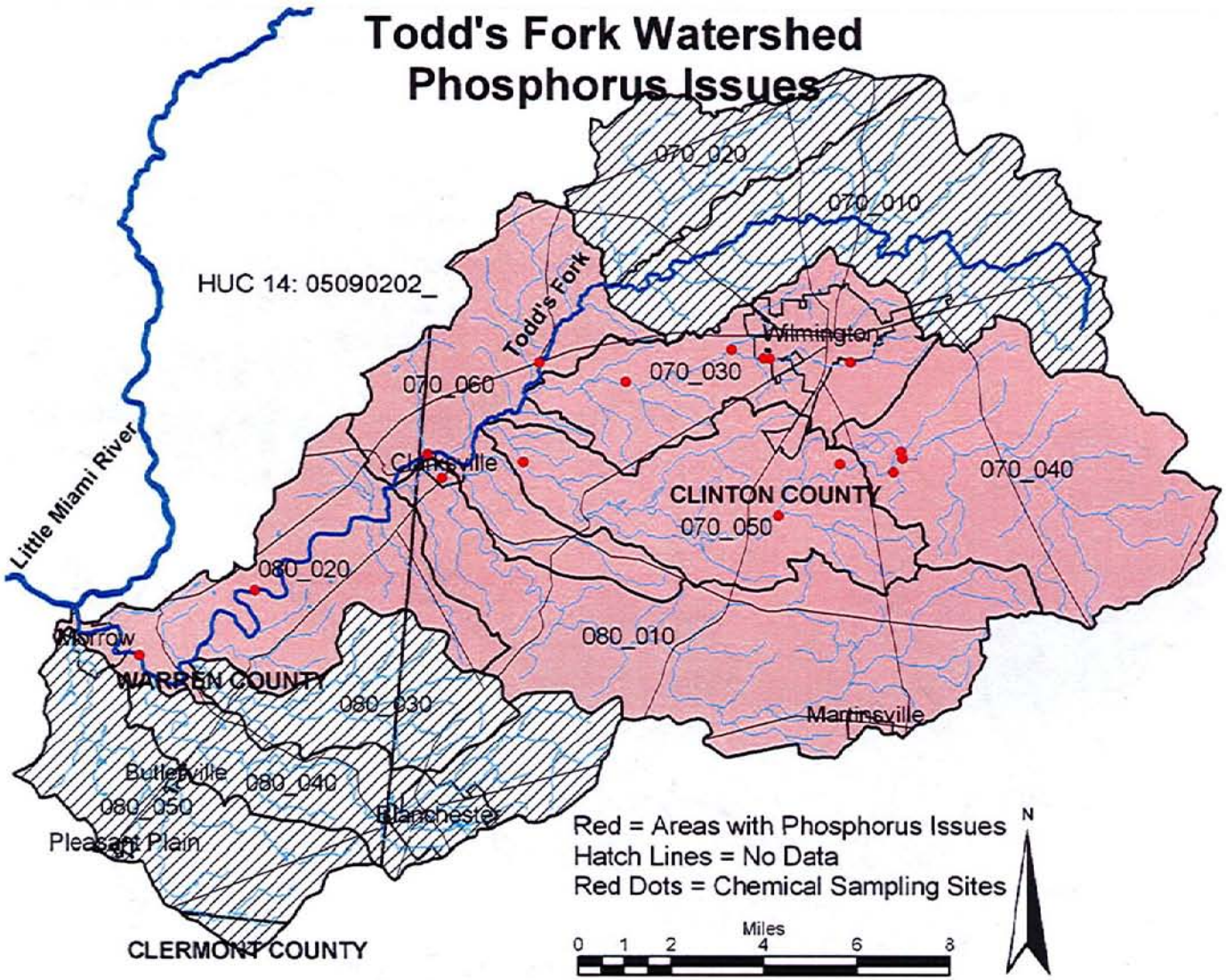

Figure 24. Phosphorus Issues in the Todd's Fork Watershed

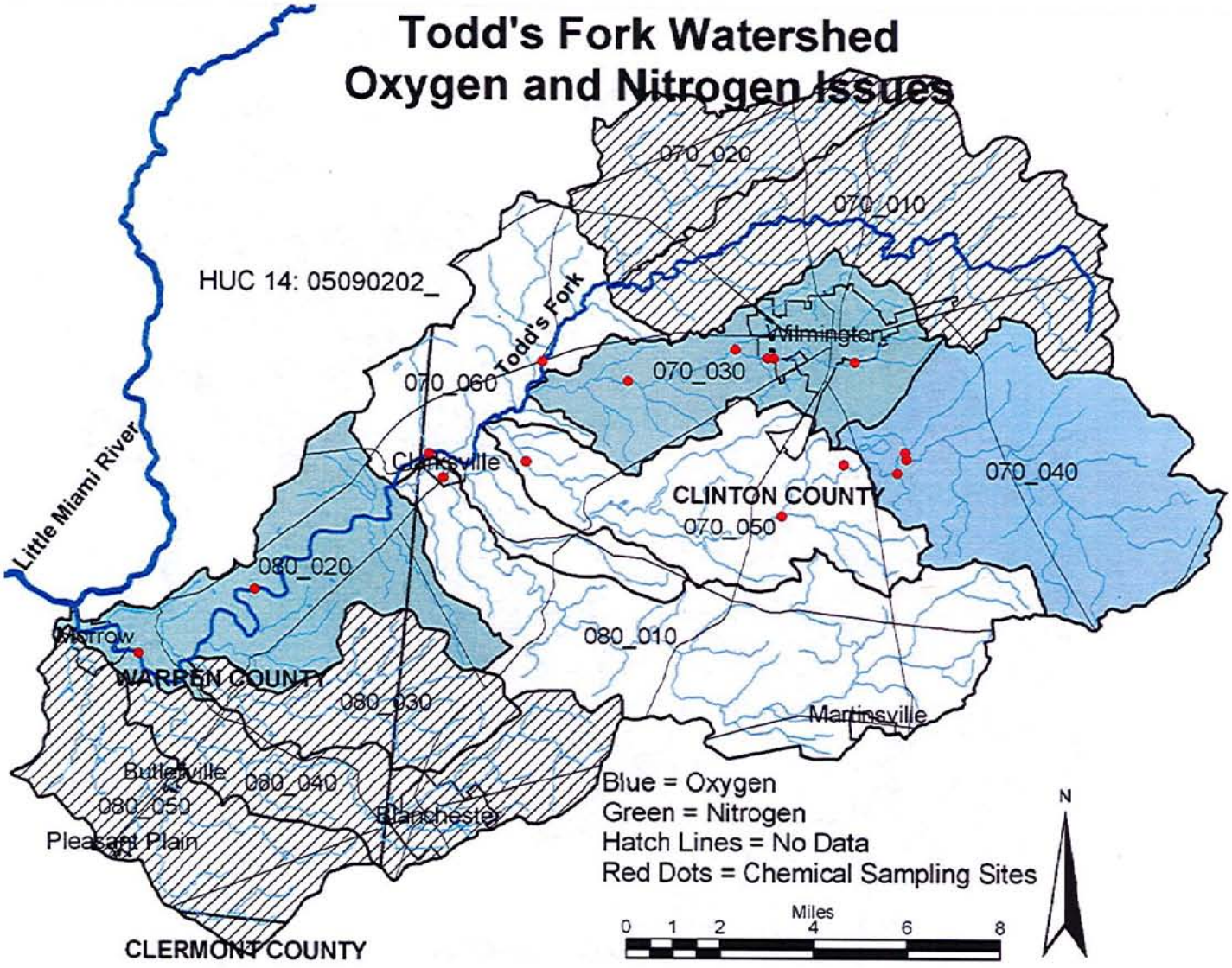

Figure 25. Total Nitrogen and Oxygen Depletion Issues in the Todd's Fork Watershed

East Fork of the Todd's Fork
HUC: 05090202 080 010

Streams: East Fork, tributaries

Use Attainment

The East Fork is designated as Warm Water Habitat and is in Partial-Attainment Status. See Figures 14 and 15.

305 (b) Report

No additional data. See Figure 16.

Biological and Water Quality Study

No additional data. See Figure 17.

Biological Data

Biological data is only available for one point on one segment for one year. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1998	1.2	7.935	44	79.5	-	W	ECBP
(Attainment)		N	Y	Y	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 7. Biological Data Available for the East Fork of the Todd's Fork

Ohio Chemical Sampling Data

Data are only provided for sampling areas and contaminates that exceed a specific standard. See Figures 21, 22, and 23.

Date	P	Na	As	Ba	Cd	Cr	Ni	Mn
07/16/98	-	23	2	49	0.2	30	40	-
07/30/98	-	20	2	46	0.2	30	40	-
08/13/98	0.11	13	2	41	0.2	30	40	-
08/27/98	0.21	16	2	50	0.2	30	40	86
09/10/98	0.08	18	2	52	0.2	30	40	114

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Mn = magnesium
Ni = nickel

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 8. Sampling Site: East Fork, Todd's Fork at Clarksville, River Mile 1.6

Todd's Fork, Lower River Section
HUC: 05090202 080 020

Streams: Todd's Fork, tributaries

Use Attainment

The Todd's Fork is designated as Warm Water Habitat and is in Full-Attainment Status and Partial-Attainment Status, depending upon the River Mile. See Figures 14 and 15.

305 (b) Report

Causes of impairment are determined as Nutrients and the sources of the impairment are determined as Municipal Point Sources. See Figure 16.

Biological and Water Quality Study

Comparing this data to the Warm Water Habitat standards, in 1999, 18.4 miles fully met and 2.6 miles partially met the standards. The lower 5.0 miles of the Todd's Fork were found to contain high levels of nutrients causing impacts to water quality and fish communities. Non-point Sources of Impairment are from Agriculture, Urban and Land Disposal categories. See Figure 17.

Biological Data

Biological data only for the main stem of the Todd's Fork. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1998	.3	9.000	44	67.5	-	W	IP
(Attainment)		Y	Y	Y	-		
1998	.4	-	-	-	VG		IP
(Attainment)		-	-	-	Y		
1998	2.5	-	-	-	VG		IP
(Attainment)		-	-	-	Y		
1998	2.6	7.339	38	78	-	W	IP
(Attainment)		N	N	Y	-		
1998	5.6	8.823	42	79	-	W	IP
(Attainment)		Y	Y	Y	-		
1998	8.6	-	-	-	VG		IP
(Attainment)					Y		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 9. Biological Data Available for the Lower Todd's Fork

Ohio Chemical Sampling Data

Data are only provided for sampling areas and contaminates that exceed a specific standard. See Figures 21, 22, and 23.

Date	P	Na	As	Ba	Cd	Cr	Ni	Mn
07/30/98	-	21	2	45	0.2	30	40	75
08/13/98	0.13	22	3	56	0.2	30	40	-
08/27/98	0.22	22	2	59	0.2	30	40	-
09/10/98	0.13	24	2	54	0.2	30	40	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Mn = magnesium
Ni = nickel

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 10. Sampling Site: Todd's Fork, Todd's Fork at Marrow, River Mile 0.14

Date	P	TotN	Na	As	Ba	Cd	Cr	Ni	Mn	COD
07/16/98	0.11	-	25	3	56	0.2	30	40	-	-
07/16/98	-	-	22	2	53	0.2	30	40	76	25
08/13/98	0.25	-	22	3	58	0.2	30	40	42	-
08/27/98	0.23	-	21	2	62	0.2	30	40	-	-
09/10/98	-	1	23	2	53	0.2	30	40	-	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Mn = magnesium
Ni = nickel
TotN = Total Nitrogen
COD = Chemical Oxygen Demand

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 11. Sampling Site: Todd's Fork, Todd's Fork SE of Marrow, River Mile 2.65

Date	P	Na	As	Ba	Cd	Cr	Ni	Mn
07/16/08	0.29	25	3	58	0.2	30	40	-
07/30/98	0.16	24	3	56	0.2	30	40	47
08/13/98	0.79	22	6	58	0.2	30	40	-
08/27/98	0.36	25	6	61	0.2	30	40	-
09/10/98	0.36	24	5	56	0.2	30	40	

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Mn = magnesium
Ni = nickel

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 12. Sampling Site: Todd's Fork, East of Marrow, River Mile 8.53

Lick Run
HUC: 05090202 080 030

Streams: Lick Run, tributaries

Use Attainment

The Lick Run is designated as Exceptional Warm Water Habitat and is in Partial-Attainment Status. See Figures 14 and 15.

305 (b) Report

No additional data. See Figure 16.

Biological and Water Quality Study

No additional data. See Figure 17.

Biological Data

Biological data is only available for one point on one segment for one year of Lick Run. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
2002	2.7	4.933	48	67.5	-	?	IP
(Attainment)		N	Y	Y	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 13. Biological Data Available for Lick Run

Ohio Chemical Sampling Data

No additional data. See Figures 21, 22, and 23.

Second Creek
HUC: 05090202 080 040

Streams: Second Creek, tributaries

Use Attainment

The Second Creek is designated a Warm Water Habitat and has an unknown status. See Figures 14 and 15.

305 (b) Report

No additional data. See Figure 16.

Biological and Water Quality Study

No additional data. See Figure 17.

Biological Data

No additional data. See Figure 19.

Ohio Chemical Sampling Data

No additional data. See Figures 21, 22, and 23.

First Creek
HUC: 05090202 080 050

Streams: First Creek, tributaries

Use Attainment

There are no use designations for any streams in this watershed. See Figures 14 and 15.

305 (b) Report

No additional data. See Figure 16.

Biological and Water Quality Study

No additional data. See Figure 17.

Biological Data

No additional data. See Figure 19.

Ohio Chemical Sampling Data

No additional data. See Figures 21, 22, and 23.

Todd's Fork, Upper River Section
HUC: 05090202 070 010

Streams: Todd's Fork, tributaries

Use Attainment

The Todd's Fork is designated a Warm Water Habitat and has an unknown status in this watershed. See Figures 14 and 15.

305 (b) Report

No additional data. See Figure 16.

Biological and Water Quality Study

By Warm Water Habitat standards, in 1999, 18.4 miles fully met and 2.6 miles partially met the standards. The lower 5.0 miles of the Todd's Fork were found to impact by excessive nutrients causing impacts to water quality and fish communities. Non-point Sources of Impairment are from Agriculture, Urban and Land Disposal categories. See Figure 17.

Biological Data

No additional data. See Figure 19.

Ohio Chemical Sampling Data

No additional data. See Figures 21, 22, and 23.

Dutch Creek
HUC: 05090202 070 020

Streams: Dutch Creek, tributaries

Use Attainment

The Dutch Creek is designated as Exceptional Warm Water Habitat and is in Partial-Attainment Status. See Figures 14 and 15.

305 (b) Report

No additional data. See Figure 16.

Biological and Water Quality Study

No additional data. See Figure 17.

Biological Data

Biological data is only available for one point on one segment for one year of Dutch Creek. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
2000	2.10	5.199	46	58.5	-	?	ECBP
(Attainment)		N	Y	N	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 14. Biological Data Available for Dutch Creek

Ohio Chemical Sampling Data

No additional data. See Figures 21, 22, and 23.

Lytle Creek
HUC: 05090202 070 030

Streams: Lytle Creek, tributaries

Use Attainment

The Lytle Creek is designated as Warm Water Habitat and is in Partial-Attainment Status. The Lytle Creek Tributary (River Mile 9.75) is not designated and is in Non-Attainment status. See Figures 14 and 15.

305 (b) Report

Causes of impairment are determined as Organic Enrichment, by Major Municipal Point Source and Industrial Permitted, and Unknown Toxicity, by Major Municipal Point Source. De-icing chemicals, from ABX Airport, impair Lytle Creek from its headwaters to the Wilmington WWTP. The Wilmington WWTP causes a delay in recovery. See Figure 16.

Biological and Water Quality Study

The biological communities of Lytle Creek were impaired by the Wilmington WWTP discharge and the deicing chemicals used at the ABX airport. Non-point Sources of Impairment are from Agriculture, Urban and Land Disposal categories. See Figure 17.

Biological Data

Biological data for the main stem of the Lytle Creek and the Lytle Creek Tributary (River Mile 9.75). See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1996	0.6	5.511	4.6	57.5	-	HW	ECBP
(Attainment)		N	Y	Y	-		
1996	0.7	-	-	-	G		
(Attainment)		-	-	-	Y		
1996	1.4	5.895	56	76.5	-	HW	ECBP
(Attainment)		N	Y	Y	-		
1998	2.6	4.066	30	-	F	HW	ECBP
(Attainment)		N	N	-	N		
1996	2.8	-	-	-	F		
(Attainment)		-	-	-	N		
1996	2.9	4.222	28	57.5	-	HW	ECBP
(Attainment)		N	N	Y	-		
1996	6.0	3.865	28	71.5	P	HW	ECBP
(Attainment)		N	N	Y	N		
1998	6.1	4.805	32	-	F	HW	ECBP
(Attainment)		N	N	-	N		
1998	6.7	3.057	24	-	P	HW	ECBP
(Attainment)		N	N	-	N		
1996	7.00	4.347	32	65.5	P	HW	ECBP
(Attainment)		N	N	Y	N		
1998	7.00	3.245	28	-	F	HW	ECBP
(Attainment)		N	N	-	N		
1996	8.10	4.339	22	49.0	P	HW	ECBP
(Attainment)		N	N	Y	N		
1996	8.60	-	-	-	P		
(Attainment)		-	-	-	N		
1996	8.80	1.551	26	55.0	-	HW	ECBP
(Attainment)		N	N	Y	-		
1996	9.30	-	-	-	P		
(Attainment)		-	-	-	N		
1998	9.30	1.709	24	-	F	HW	ECBP
(Attainment)		N	N	-	N		
1996	9.60	1.250	16	-	-	HW	ECBP
(Attainment)		N	N	-	-		
1996	10.20	-	12	48.5	VP	HW	ECBP
(Attainment)		-	N	Y	N		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 15. Biological Data Available for the Lytle Creek

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1996	0.7	-	-	-	P		
(Attainment)		-	-	-	N		
1996	0.8	-	12	-	-	HW	ECBP
(Attainment)		-	N	-	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 16. Biological Data Available for the Tributary (River Mile 9.75) of the Lytle Creek

Ohio Chemical Sampling Data

Data are only provided for sampling areas and contaminates that exceed a specific standard. See Figures 21, 22, and 23.

Date	P	TotN	Na	As	Ba	Cd	Cr	Ni	Nit	BOD5	COD	TOC
2/10/00	2.37	1.45	-	-	-	-	-	-	-	459	-	100
7/16/98	2.89	-	24	8	53	0.2	30	40	-	-	-	-
7/30/98	3.14	-	21	32	41	0.2	30	40	10.6	-	-	-
8/13/98	4.02	-	16	13	37	0.2	30	40	-	-	-	-
8/27/98	6.94	-	16	16	37	0.2	30	40	-	-	29	-
9/10/98	4.89	-	16	21	27	0.2	30	40	12.5	-	-	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Nit = nitrates
BOD5 = Biological Oxygen Demand
TotN = Total Nitrogen
COD = Chemical Oxygen Demand
TOC = Total Organic Carbon

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 17. Sampling Site: Lytle Creek, River Mile 2.76

Date	P	TotN	Pb	Na	As	Ba	Cd	Cr	Ni	Nit	COD
7/30/98	4.33	1.1	-	20	39	33	0.2	30	40	13	22
8/13/98	4.95	1.2	12	16	175	27	0.2	30	40	12.5	29
9/10/98	4.04	-	-	14	101	17	0.2	30	40	11.1	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Nit = nitrates
Pb = lead
TotN = Total Nitrogen
COD = Chemical Oxygen Demand

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 18. Sampling Site: Lytle Creek, River Mile 5.95

Date	P	TotN	Phenolics	Na	As	Ba	Cd	Cr	Ni	TOC
7/13/1998	4.99	1.2	10	19	9	24	0.2	30	40	9.5

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
TotN = Total Nitrogen
TOC = Total Organic Carbon

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 19. Sampling Site: Lytle Creek, Wilmington WWTP 001 Outflow, River Mile 6.83

Date	P	TotN	DO	Sr	TDS	Na	As	Ba	Cd	Cr	Ni	Mn	BOD5	COD	TOC
2/10/00	0.14	3.42	-	-	1880	-	-	-	-	-	-	-	1370	-	580
7/16/98	0.11	-	-	-	-	29	2	82	0.2	30	40	-	-	-	-
7/30/98	-	-	-	-	-	31	3	92	0.2	30	40	125	-	21	-
8/13/98	0.17	-	-	-	-	18	4	66	0.2	30	40	148	-	-	-
8/27/98	0.22	-	4	-	-	20	3	84	0.2	30	40	267	-	40	-
9/11/98	-	-	-	1180	-	29	2	102	0.2	30	40	129	-	-	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Mn - magnesium
Sr = strontium
TDS = Total Dissolved Solids
DO = Dissolved Oxygen
BOD5 = Biological Oxygen Demand
TotN = Total Nitrogen
COD = Chemical Oxygen Demand
TOC = Total Organic Carbon

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 20. Sampling Site: Lytle Creek, River Mile 7.01

Date	P	TotN	Na	As	Ba	Cd	Cr	Ni	Mn	COD
7/16/98	0.15	-	29	3	88	0.2	30	40	65	-
7/30/98	0.12	-	32	4	98	0.2	30	40	42	-
8/13/98	0.19	-	23	4	82	0.2	30	40	64	-
8/27/98	0.32	-	20	3	79	0.2	30	40	79	31
9/10/98	0.12	1.5	34	4	118	0.2	30	40	85	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Mn - magnesium
COD = Chemical Oxygen Demand

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 21. Sampling Site: Lytle Creek, River Mile 9.25

Cowan Creek, Upper Stream Section
HUC: 05090202 070 040

Streams: Cowan Creek, Indian Run, tributaries

Use Attainment

The Cowan Creek is designated as Warm Water Habitat and is in Partial to Non-Attainment Status, dependent upon location. The Indian Run is designated as Warm Water Habitat is in Non-Attainment Status. See Figures 14 and 15.

305 (b) Report

The sections of Cowan Creek in non-attainment are from intermittent stream flow. Those sections in partial-attainment are the results of low flow and de-icing chemicals from the ABX Airport. Causes of Impairment are Flow Alteration due to Natural Causes and Industrial Permitted categories.

Causes of Impairment for Indian Run are due to Other Habitat Alterations from Canalizations – Development categories. Other sources of impairment are from Industrial Permitted use.

See Figure 16.

Biological and Water Quality Study

In 1999, 13.5 miles of Cowan Creek were evaluated and 11.8 miles fully-attained, 0.9 miles partial-attained, and 0.8 miles did not attain designated status. The impairment to Cowan Creek upstream of Indian Run is unknown. The impairment to Cowan Creek downstream of Indian Run may be due to ABX Airport. Non-point Sources of Impairment are from Agriculture and Land Disposal categories.

Indian Run did not meet status due to poor habitat. Non-point Sources of Impairment are from Agriculture and Urban categories.

See Figure 17.

Biological Data

Biological data for the main stem of the Cowan Creek, Upper Stream Section, and the Indian Run. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1996	12.5	-	-	-	G		
(Attainment)		-	-	-	Y		
1996	13.2	-	-	-	F		
(Attainment)		-	-	-	N		
1996	13.3	7.161	46	58.5	-	HW	ECBP
(Attainment)		N	Y	Y			
1998	13.3	4.438	34	-	F	HW	ECBP
(Attainment)		N	N	-	N		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 22. Biological Data Available for Cowan Creek, Upper River Section

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1998	.2	2.892	28	-	F	HW	ECBP
(Attainment)		N	N	-	N		
1996	.3	-	-	-	MG		
(Attainment)		-	-	-	N		
1996	.4	5.756	30	35.5	-		ECBP
(Attainment)		N	N	N			

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 23. Biological Data Available for Indian Run

Ohio Chemical Sampling Data

Chemical data for Cowan Creek, Upper Stream Section, and Indian Run. See Figures 21, 22, and 23.

Date	P	DO	Sr	Na	As	Ba	Cd	Cr	Ni	Al	Mn
7/16/98	-	-	-	30	2	75	0.2	30	40	-	-
7/30/98	-	-	1360	35	2	82	0.2	30	40	-	66
8/13/98	0.36	-	-	17	6	64	0.2	30	40	1290	109
8/27/98	0.21	4.4	-	27	3	75	0.2	30	40	-	92
9/10/98	-	-	-	27	3	78	0.2	30	40	-	63

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Mn – magnesium
Sr = strontium
Al = aluminum
DO = Disolved Oxygen

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 24. Sampling Site: Cowan Creek, River Mile 12.45

Date	P	Na	As	Ba	Cd	Cr	Ni	Al	Mn	COD
2/10/00	-	-	-	-	-	-	-	-	-	-
7/16/98	-	30	2	67	0.2	30	40	-	-	-
7/30/98	-	30	2	64	0.2	30	40	608	48	-
8/13/98	0.24	18	4	56	0.2	30	40	-	49	24
8/27/98	0.19	29	2	70	0.2	30	40	-	89	-
9/10/98	-	29	2	60	0.2	30	40	-	54	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Mn – magnesium
Al = aluminum
COD = Chemical Oxygen Demand

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 25. Sampling Site: Cowan Creek, River Mile 13.2

Date	P	Na	As	Ba	Cd	Cr	COD
7/16/98	-	30	2	106	0.2	30	-
7/30/98	-	37	2	126	0.2	30	-
8/13/98	0.25	28	3	119	0.2	30	-
8/27/98	-	24	2	117	0.2	30	31
9/10/98	-	37	2	127	0.2	30	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
COD = Chemical Oxygen Demand

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 26. Sampling Site: Indian Run, River Mile 0.1

Cowan Creek, Lower Stream Section (including Cowan Lake)
HUC: 05090202 070 050

Streams: Cowan Creek, Wilson Creek, tributaries

Use Attainment

The Cowan Creek is designated as Warm Water Habitat and is in Full- to Partial-to Non-Attainment Status from upstream to downstream, in general. See Figures 14 and 15.

Wilson Creek is designated as Warm Water Habitat and is in Partial-Attainment Status.

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No additional data. See Figure 16.

Biological and Water Quality Study

In 1999, 13.5 miles of Cowan Creek were evaluated and 11.8 miles fully-attained, 0.9 miles partial-attained, and 0.8 miles did not attain designated status. Non-point Sources of Impairment are from Agriculture and Land Disposal categories. See Figure 17.

Biological Data

Biological data for the main stem of the Cowan Creek, Lower Stream Section, and the Wilson Creek. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1998	1.20	7.831	38	63.0	G	W	ECBP
(Attainment)		N	N	Y	Y		
2001	6.40	6.637	28	49.5	-	B	ECBP
(Attainment)		N	N	Y			
2001	6.60	-	-	-	16		
(Attainment)		-	-	-	N		
1996	6.90	-	-	-	G		
(Attainment)		-	-	-	Y		
2001	6.90	3.805	14	62.5	30	W	ECBP
(Attainment)		N	N	Y	N		
2001	7.30	8.644	36	76.0	30	W	ECBP
(Attainment)		Y	N	Y	N		
1996	8.4	-	-	-	G		
(Attainment)		-	-	-	Y		
1996	8.5	9.068	42	64	-	W	ECBP
(Attainment)		Y	Y	Y	-		
1998	8.5	9.278	50	-	VG	W	ECBP
(Attainment)		Y	Y	-	Y		
2001	8.5	8.423	42	78.0	38	W	ECBP
(Attainment)		Y	Y	Y	Y		
1996	10.9	8.385	46	62.5	G	W	ECBP
(Attainment)		Y	Y	Y	Y		
1998	10.9	8.916	44	73.5	G	W	ECBP
(Attainment)		Y	Y	Y	Y		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 27. Biological Data Available for Cowan Creek, Lower Stream Section

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
2002	1.60	5.699	54	70.0	-	HW	ECBP
(Attainment)		N	Y	Y	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 28. Biological Data Available for Wilson Creek

Ohio Chemical Sampling Data

Chemical data for Cowan Creek, Lower Stream Section. See Figures 21, 22, and 23.

Date	P	Na	As	Ba	Cd	Cr	Ni
7/16/98	-	17	2	43	0.2	30	40
7/30/98	0.08	19	2	44	0.2	30	40
8/13/98	0.12	17	2	39	0.2	30	40
8/27/98	-	21	2	64	0.2	30	40

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 29. Sampling Site: Cowan Creek, River Mile 1.34

Date	P	Na	As	Ba	Cd	Cr	Ni	Al	Mn	BOD5	TOC
02/10/00	-	-	-	-	-	-	-	-	-	1020	330
7/16/98	-	31	2	73	0.2	30	40	-	-	-	-
7/30/98	-	29	2	69	0.2	30	40	-	-	-	-
8/13/98	0.18	10	2	46	0.2	30	40	-	68	-	-
8/27/98	0.09	24	2	72	0.2	30	40	1230	-	-	-
9/10/98	-	27	2	72	0.2	30	40	-	-	-	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Mn – magnesium
Al = aluminum
BOD5 = Biological Oxygen Demand
TOC = Total Organic Carbon

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 30. Sampling Site: Cowan Creek, River Mile 8.38

Date	P	DO	Na	As	Ba	Cd	Cr	Ni	Al	Mn	BOD5
7/16/98	-	-	33	2	78	0.2	30	40	-	-	-
7/30/98	-	-	30	2	73	0.2	30	40	-	70	26
8/13/98	0.22	-	12	7	52	0.2	30	40	1490	99	-
8/27/98	0.11	4.5	20	3	65	0.2	30	40	-	66	-
9/10/98	0.16	-	28	3	83	0.2	30	40	480	42	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Ni = nickel
Mn – magnesium
Al = aluminum
BOD5 = Biological Oxygen Demand
DO = Dissolved Oxygen

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 31. Sampling Site: Cowan Creek, River Mile 10.95

Todd's Fork, Central Stream Section
HUC: 05090202 070 060

Streams: Todd's Fork, Moore Brach, Little Creek, tributaries

Use Attainment

The Todd's Fork is designated as Warm Water Habitat and is in Full-Attainment status from River Mile 15.10 to 19.60 and Partial-Attainment Status at River Mile 20.30.

The Moore Branch is designated as a Warm Water Habitat and is in Partial-Attainment status.

The Little Creek is designated as a Warm Water Habitat and is in Partial-Attainment status.

See Figures 14 and 15.
305 (b) Report

Causes of impairment are determined as Nutrients and the sources of the impairment are determined as Municipal Point Sources. See Figure 16.

Biological and Water Quality Study

By Warm Water Habitat standards, in 1999, 18.4 miles fully met and 2.6 miles partially met the standards. The lower 5.0 miles of the Todd's Fork were found to impact by excessive nutrients causing impacts to water quality and fish communities. Non-point Sources of Impairment are from Agriculture, Urban and Land Disposal. See Figure 17.

Biological Data

Biological data is only available for one point on one segment for one year of Dutch Creek. See Figure 19.

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
1998	15.10	-	-	-	VG		
(Attainment)		-	-	-	Y		
1998	19.50	8.574	50	67.5	-	W	ECBP
(Attainment)		Y	Y	Y	-		
1998	19.60	-	-	-	36		
(Attainment)		-	-	-	Y		
1998	20.30	7.777	48	76.0	-	W	ECBP
(Attainment)		N	Y	Y	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 32. Biological Data Available for Todd's Fork, Central Stream Section

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
2000	1.4	4.259	42	40.5	-	HW	ECBP
(Attainment)		N	Y	N	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 33. Biological Data Available for Moore Branch

Sampling Year	River Mile	IWB2	IBI	QHEI	ICI	Type	Ecoregion
2000	2.5	5.190	46	52.0	-	HW	ECBP
(Attainment)		N	Y	Y	-		

IWB2 – Index of Well-Being 2
IBI – Index of Biotic Integrity
QHEI – Quality Habitat and Environment Index
ICI – Invertebrate Community Index
Type – Type of Sampling Method, W = Wading, B = Boat
Ecoregion – ECBP = Eastern Corn Belt Plain, IP = Interior Plateau

Table 34. Biological Data Available for Little Creek

Ohio Chemical Sampling Data

Chemical data for Cowan Creek, Middle Stream Section. See Figures 21, 22, and 23.

Date	P	Na	As	Ba	Cd	Cr	Ni	Al	Mn	COD
07/16/98	0.35	25	4	58	0.2	30	40	-	-	-
07/16/98	0.4	26	6	59	0.2	30	40	-	-	-
08/13/98	0.33	22	3	53	0.2	30	40	619	59	-
08/27/98	2.24	22	12	64	0.2	30	40	534	51	20
09/10/98	1.38	25	6	58	0.2	30	40	370	-	-

P = phosphorus
Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium
Mn = magnesium
Ni = nickel
Al = aluminum
COD = Chemical Oxygen Demand

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 35. Sampling Site: Todd's Fork, River Mile 15.17

Date	Na	As	Ba	Cd	Cr
07/16/98	31	2	64	0.2	30
07/16/98	30	2	67	0.2	30
08/13/98	32	2	70	0.2	30
08/27/98	33	2	81	0.2	30
09/10/98	35	2	75	0.2	30

Na = sodium
As = arsenic
Ba = barium
Cd = cadmium
Cr = chromium

Standards
Clear Background = Aquatic Life Standards
Red Letter = Proposed Aquatic Life Standards
Grey Background = Drinking Water Standards
Light Blue Background = Median LMRW values

Table 36. Sampling Site: Todd's Fork, River Mile 19.5

Summary of Todd's Fork Data

East Fork of the Todd's Fork
HUC: 05090202_080_010

Streams: East Fork, tributaries

Stream/River	Use-Designation	Status	Problems
East Fork	WWH	Partial	IWB2
			Increased Phosphorus

Problems affecting entire area: Only 1 Chem. Site Sample, Only 1 Bio Site Sample

Todd's Fork, Lower River Section
HUC: 05090202_080_020

Stream/River	Use-Designation	Status	Problems
Todd's Fork	WWH	Partial	IWB2 at RM 2.6
			Increased Phosphorus

Problems affecting entire area: Nutrients – Municipal, Agriculture

Lick Run
HUC: 05090202_080_030

Stream/River	Use-Designation	Status	Problems
Lick Run	EWWH	Partial	IWB2

Problems affecting entire area: No Chem. Site Sample, Only 1 Bio Site Sample

Second Creek
HUC: 05090202_080_040

Stream/River	Use-Designation	Status	Problems
Second Creek	WWH	?	?

Problems affecting entire area: No chemical or biological data

First Creek
HUC: 05090202_080_050

Stream/River	Use-Designation	Status	Problems
First Creek	?	?	?

Problems affecting entire area: No chemical or biological data

Todd's Fork, Upper River Section
HUC: 05090202_070_010

Stream/River	Use-Designation	Status	Problems
Todd's Fork	WWH	?	?

Problems affecting entire area: No chemical or biological data. Agricultural, urban, and Land Use Disposal Issues.

Dutch Creek
HUC: 05090202_070_020

Stream/River	Use-Designation	Status	Problems
Dutch Creek	EWWH	Partial	IBI

Lytle Creek
HUC: 05090202_070_030

Stream/River	Use-Designation	Status	Problems
Lytle Creek	WWH	Partial	IWB2 – entire length
			IBI – from RM 2.6 to Source
			ICI – from RM 2.6 to Source
			High Levels of Phosphorous
			Total Nitrogen
Trib to Lytle Creek RM 9.75	?	?	IBI
			Only one Bio Sample
			No Chemical Sample

Problems affecting entire area: Municipal enrichment, de-icing chemicals, agriculture, urban, and land use disposal issues.

Cowan Creek, Upper Stream Section
HUC: 05090202_070_040

Stream/River	Use-Designation	Status	Problems
Cowan Creek	WWH	Partial	IWB2 – entire length
			IBI – above RM 13.3 to Source
			ICI – above RM 13.3 Source
			Phosphorous
			Oxygen Depletion
			Canalization

Indian Run	WWH	Non	IWB2
			IBI
			QHEI
			ICI
			De-icing chemicals
			Canalization
			Flow Alteration
			Phosphorus
			ABX Chemicals

Problems affecting entire area: Agricultural, land disposal, poor habitat and industry issues.

Cowan Creek, Lower Stream Section (including Cowan Lake)
HUC: 05090202_070_050

Stream/River	Use-Designation	Status	Problems
Cowan Creek	WWH	Partial	IWB2 – Mouth to RM 7.3
			IBI – Mouth to RM 8.4
			ICI – from RM 6.6 to RM 7.3
Wilson Creek	WWH	?	IWB2
			Phosphorus

Problems affecting entire area: Agricultural and land use disposal issues.

Todd's Fork, Central Stream Section
HUC: 05090202_070_060

Stream/River	Use-Designation	Status	Problems
Todd's Fork	WWH	Partial	IWB2 – at RM 20.30
			High levels of Phosphorus at RM 15.7
Moore Branch	WWH	Partial	IWB2
			QHEI
Little Creek	WWH	Partial	IWB2

Problems affecting entire area: Agricultural, urban and land disposal issues and nutrients from municipal sources.

CHAPTER 4: COMMUNITY WATER RESOURCE MANAGEMENT INTERESTS

Public Input

Public input into the development of a watershed wide action plan is critical for four reasons:

1. To find out what the public does and does not know
2. To bring resources and ideas to the project
3. To understand and represent what the public wants to have accomplished
4. To build the support needed for the development of a watershed-wide group

The watershed action planning process is designed to address data-driven watershed concerns and what the public sees as issues within the watershed. Therefore, the process must include investigating citizen concerns and how the public wishes to resolve those issues. This process also provides information on how the public sees the watershed; thus, allowing for an understanding of what the public does and does not know or understand.

Resources, whether money, time or effort, are often hard to acquire to address a specific issue. By involving the public scarce resources can be brought together, by agreements and partnerships, to help address a specific concern. During this process of information gathering and agreements, the public support for a watershed group can be determined and nurtured. This creates the opportunity for more public induced projects and agreements.

Process

To attain the needs and create actionable items that would be undertaken, the Little Miami River Partnership's Watershed Coordinator developed a systematic public-meeting process. This process was then reviewed by experts from the Ohio State University Extension. Figure 25 represents this simple process.

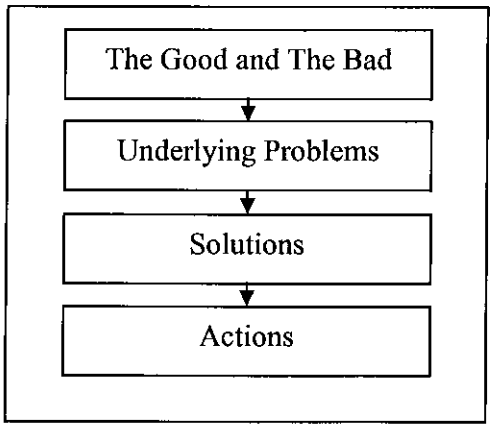

Figure 26. Public Input Process for the Todd's Fork Watershed Action Plan

The process centers around a facilitated process of having public meeting attendees identify the good (assets) and bad (problems) of the watershed. After these issues are identified and grouped into similar categories, a second series of public meetings are held to identify underlying problems. Finally, the last public meeting is held to identify possible solutions and actions that groups or individuals will commit to undertaking.

This process provides information so that the four main aspects of public input can be answered and provides for actionable items to be identified and undertaken by the public.

The Todd's Fork Watershed Action Plan Public Meetings and Results

The Todd's Fork Watershed Action Plan public meeting process involved six public meetings and one interactive internet-based public forum. All meetings and the forum were advertised by multiple news articles from the Western Star Newspaper (Lebanon), the Wilmington News Journal Newspaper (Wilmington), and various radio spots, plus coverage on the LMRP Website, public advertisements at local government offices, and phone calls to over 60 stakeholders.

This resulted in:

- Over 90 participants volunteering over 200 hours for this process
- 66 Good Qualities of the watershed identified
- 90 Bad Issues of the watershed identified
- 4 Main Categories of problems identified
- 92 Underlying Problems identified
- 29 Categories of underlying problems identified
- 78 Possible Solutions identified
- 8 Organizations who volunteered to start to address some of the issues
- Creation of an ad-hoc watershed committee to review and implement the watershed plan

All of the details of these meetings can be found in Appendix Two (page 142).

The four Main Categories of problems are:

1. Urbanization
2. Agricultural Related Issues
3. Run-Off
4. Septic/Waste Water Issues

The 29 Categories of Underlying Problems are:

- Lack of Effective Zoning
- Loss of Farmland, Open Space and Forests
- Traffic Problems
- Lack of Developmental Planning
- Not Enough Riparian Zone Protection
- No Central Sewers and Storm Sewer Problems
- Flood Plain Development
- Not Enough Recreational Use
- No Use of the Fed. Prime Ag. Pres. Program

- Business Expansions and no centralized industry development areas
- Impervious Surfaces
- Need to Improve Drainage
- Ag. Enterprise Zone
- Over applied chemicals in Residential Areas
- Ag-Related Issues
- Litter
- Air Pollution
- Yard Waste Disposal
- Pond Development and Maintenance
- Development Runoff
- Industrial/Small Business Chemical and Pollution Disposal
- Noise Pollution
- Waste Water Treatment Plant Issues
- Home Sewer Systems
- Education: Rural Life and Urbanization
- Education: Conservation and Environmental Practices
- Education: Zoning and Development Plans
- Education: Proper Use and Disposal of Chemicals
- Education: Enforcement

The top three categories, by group prioritization are:

- Traffic Problems
- Not Enough Riparian Zone Protection
- Development Runoff

The underlying problem categories that have volunteer organizations for implementation are represented in Table 37.

Problem Category	Volunteer Groups
1. Lack of Effective Zoning	1. Clinton RPC
2. Loss of Farmland, Open Space, and Forests	1. Clinton County Open Lands 2. Little Miami, Inc. (LMI) 3. Lytle Creek League of Conservators
3. Not Enough Riparian Zone Protection	1. LMI 2. Clinton County Open Lands 3. NRCS 4. Lytle Creek League of Conservators 5. Clinton County Stream Keepers
4. Not Enough Recreational Use, Bike and Nature Trails	1. Lytle Creek League of Conservators
5. No Use of the Federal Prime Agriculture Preservation Program	1. NRCS
6. Impervious Surfaces	1. Streamkeepers - Education
7. Over Applied Chemicals in Residential Areas	1. Streamkeepers
8. Agriculture related Issues: Erosion, Chemical Applications, Waste Storage and Disposal, Sludge Spreading, Dumps, Burn Barrels, Nutrient Management and Funding for Best Management Practices	1. NRCS
9. Litter	1. Lytle Creek League of Conservators 2. ODNR 3. Clinton County Stream Keepers
10. Noise Pollution	1. Green Space Preservation
11. Education: Conservation Practices (Added: Not just conservation but general education - water quality - importance of riparian corridors for mitigating development - importance of preserving habitat)	1. Streamkeepers 2. LMRP

Table 37. Problem Categories and Current Volunteer Organizations (that will help address those problems) (2006)

CHAPTER 5: WATERSHED RESTORATION AND PROTECTION GOALS

Introduction

This chapter represents the combination of all sources of impairments and dangers to the Todd's Fork watershed and subsequent restoration needs and goals. This chapter includes:

- Problem Statements
- Restoration Goals
- Participant Organizations Projects

The information is presented in three different geographic levels. These are Todd's Fork Watershed Wide, County Wide, and Sub-Basin Wide (14 Digit HUC). The reason for this is that there are some impairments, dangers, and actions that are watershed-wide, county-wide, and others that are only applicable to a small sub-watershed.

Pollutant loadings were calculated for each of the sub-watersheds (see Table 2, page 19) and used to determine potential initial reduction goals.

The Goals were based upon the consensus of field experts and those who would undertake the work within the watershed.

Technical Solutions were proposed where appropriate. They are not specified for most Goals since those specific details would need to be addressed when a detailed project is developed.

Measurable Results were proposed where appropriate. They are not specified for most Goals since those specific details would need to be addressed when a detailed project is developed.

Where Timelines, Funding Sources and Partners are not listed represents a Goal that is still under development.

The year provided under Timeline is the year that a goal will be addressed. Multiple years or "to current" represents the years the goal will be addressed or that the goal will be addressed on an on-going, continuous effort over a multi-year period.

A Problem Statement based upon community-based needs and perceptions, not data analysis, is designated by the statement: "This is a community-based program."

Note: All references to BMP's to be researched or applied will be from either the OEPA's Getting the Point about Nonpoint (Ohio NonPoint Source Pollution Management Plan-2005-2010) document detailing permissible BMP's (http://www.epa.state.oh.us/dsw/nps/NPSMP/MM/mm.html) or from the USDA-NRCS and Ohio SWCD's field office manuals. Specific BMP's will not be detailed per Issue

due to the need for possibly unique combinations of BMP's to be used per site. Those BMP's will be determined on a site by site basis to maximize the project-sites success.

Todd's Fork Watershed Wide Issues

1. Sampling Data Need

Problem: The current chemical and biological data available from sampling sites in the Todd's Fork watershed is insufficient to determine use-attainment or chemically-related impairments. Five of the eleven 14 Digit HUC's have no chemical sampling data and another three 14 Digit HUC's have only 1-3 sampling points to cover the entire sub-basin. Two of the 14 Digit HUC's have no biological sampling points and another four sub-basins have only one biological sampling point. In addition, the majority of streams in the entire watershed have no use-designation or use-attainment status information.

Goal: Develop and apply a comprehensive chemical and biological sampling project for the Todd's Fork watershed.

Goal Description	Fund Source	Timeline	Partners
Develop and apply a comprehensive chemical and biological sampling project for the Todd's Fork watershed	Grants	Plan Development: 2005; Survey: 2007	1. Ohio EPA 2. LMRP 3. Clinton, Warren SWCD 4. Clinton Stream Keepers

2. Possible Point Sources of Contamination

Problem: There are 263 possible sources of contamination scattered throughout the Todd's Fork watershed. Of these, there are 87 leaking underground tanks, mostly fuel storage containers. These leaking container issues need to be addressed in order to protect local ground water aquifers and adjacent streams.

Goal: Develop a mitigation plan to address the leaking underground tank.

Goal Description	Fund Source	Timeline	Partners
Develop a mitigation plan to address the leaking underground tank.	LMRP	2007	LMRP + regulatory agencies

3. Farmland Loss

Problem: With rapidly increasing populations and their need for land to develop for residences, agricultural land is under tremendous developmental pressure throughout the Todd's Fork watershed. In addition, loss of farmland removes valuable water retention and flooding plains from use. This is a community-based program.

Goal: Preserve farmland from development. (The organizations that have volunteered to work on this program did not provide a detailed account of the number of acres per year to be saved, only that they work on the issue.)

Goal Description	Fund Source	Timeline	Partners
Preserve farmland from development.	1. Grants 2. Local Funds 3. Organizational Funds	2005-2008	1. Clinton County Open Lands 2. Little Miami, Inc. 3. USDA – NRCS

4. Riparian Protection

Problem: With rapidly increasing populations and their need for land to develop for residences, riparian zones are under tremendous developmental pressure throughout the Todd's Fork watershed. Plus, intact riparian zones can help mitigate farmland, residential and municipal run-off problems. This is a community-based program.

Goal: Preserve riparian corridors from development. (The organizations that have volunteered to work on this program did not provide a detailed account of the number of acres per year to be saved, only that they work on the issue.)

Goal Description	Fund Source	Timeline	Partners
Preserve riparian corridors from development.	1. Grants 2. Local Funds 3. Organizational Funds	2005-2008	1. Clinton County Open Lands 2. Little Miami, Inc. 3. USDA – NRCS 4. Lytle Creek League of Conservators 5. Clinton County Park District 6. Clinton Stream Keepers

5. Impervious Surfaces

Problem: As the level of impervious surface increases within a watershed the chances to reach use-attainment status decreases. With increasing land use development and population pressures, the Todd's Fork watershed amount of impervious surfaces will increase over time. This is a community-based program.

Goal: Provide education to businesses, developers, and communities on possible alternatives and impacts of impervious surfaces.

Goal Description	Fund Source	Timeline	Partners

Provide education to businesses, developers, and communities on possible alternatives and impacts of impervious surfaces.	1. Grants 2. Local Funds 3. Organizational Funds	2005 to current	Clinton Stream Keepers

6. Over-Applied Residential Chemicals

Problem: Over-applied residential chemicals, whether pesticides, herbicides, or fertilizers get transported into local streams and cause environmental problems and use-attainment problems. As populations expand and more residential development occurs, this problem will continue to grow. This is a community-based program.

Goal: Provide educational materials and opportunities for local residents on the proper use and disposal of residential chemicals.

Goal Description	Fund Source	Timeline	Partners
Provide educational materials and opportunities for local residents on the proper use and disposal of residential chemicals.	1. Grants 2. Local Funds 3. Organizational Funds	2005 to current	Clinton Stream Keepers

7. Agricultural Related Issues

Problem: Some agricultural practices can be disruptive and damaging to streams and watershed health. All eleven 14 Digit HUC's have some impact from agricultural related practices. This ranges of nutrient enrichment, animal waste, loss of riparian cover to channelization. This causes significant use-attainment issues for the streams of the Todd's Fork watershed. This is a community-based program.

Goal: Provide assistance to develop appropriate Best Management Practices to halt or curb damaging agricultural practices.

Goal Description	Fund Source	Timeline	Partners
Provide assistance to develop appropriate Best Management Practices to halt or curb damaging agricultural practices.	1. Grants 2. Local Funds 3. FSA Funds 4. 319 Program	2005 to current	1. USDA-NRCS 2. Clinton, Warren SWCD

8. Litter

Problem: Litter from residents causes both environmental impacts as well as aesthetic problems. This is a community-based program.

Goal: Create litter pick-up programs for streams and riparian areas.

Goal Description	Fund Source	Timeline	Partners
Create litter pick-up programs for streams and riparian areas.	1. Grants 2. Local Funds 3. Organizational Funds	2006 to current	1. Lytle Creek League of Conservators 2. Ohio DNR 3. Clinton Stream Keepers

9. Conservation Practices Education

Problem: Some agricultural and residential practices can be disruptive and damaging to streams and watershed health. All eleven 14 Digit HUC's have some impact from agricultural and residential related practices. This ranges of nutrient enrichment, animal waste, loss of riparian cover, litter to canalization. This causes significant use-attainment issues for the streams of the Todd's Fork watershed. This is a community-based program.

Goal: Develop and apply educational programs aimed at residents and farmers about conservation practices.

Goal Description	Fund Source	Timeline	Partners
Develop and apply educational programs aimed at residents and farmers about conservation practices.	1. Grants 2. Local Funds 3. Organizational Funds 4. OEEF Grant	2006 to current	1. Clinton County Streamkeepers 2. LMRP

10. Watershed Plan Updating and Public Involvement

Problem: The watershed action plan will become outdated if it is not updated periodically. This updating process must include public input and participation, scientific data analysis, new implementations and implementation results. This process will involve the continuous development, retention, and use of stakeholders and their ideas, using a similar process to that used in Chapter 4 (page 102).

Goal: Update the watershed action plan in 2008.

Goal Description	Fund Source	Timeline	Partners
Update the watershed action plan	1. LMRP 2. ODNR Watershed	2008	1. LMRP

	Grant 3. SWCD's		

11. Public Involvement

Problem: Without the ability to provide input and learn of implementation results, the public will not continue to be interested in the watershed action planning process. This process will involve the continuous development, retention, and use of stakeholders and their ideas, using a similar process to that used in Chapter 4 (page 102).

Goal: Provide one public meeting a year on years where no updating to the watershed action plan takes place, multiple meetings for public input on updating years.

Goal Description	Fund Source	Timeline	Partners
Provide one public meeting a year on years where no updating to the watershed action plan takes place, multiple meetings for public input on updating years.	1. LMRP 2. ODNR Grant 3. SWCD's	2006-2010	1. LMRP

County Wide Issues

1. Home Sewer Treatment System Plans

Problem: The Ohio EPA would like each county to develop a comprehensive plan on how to address monitoring and fix failing home sewer treatment systems (HSTS). A comprehensive HSTS Plan would help identify and fix significant sewer system problems and prevent nutrient related water contamination issues in the Todd's Fork watershed.

Goal 1: Develop and apply a HSTS Plan for Warren County.

Goal Description	Fund Source	Timeline	Partners
Develop and apply a HSTS Plan for Warren County.	Local Funds	2005 to 2006	1. Warren County Health Department 2. LMRP

Goal 2: Develop and apply a HSTS Plan for Clinton County.

Goal Description	Fund Source	Timeline	Partners
Develop and apply a HSTS Plan for Clinton County.	?	?	?

2. Zoning

Problem: Inconsistency of zoning regulations, use, and variances creates varying developmental problems throughout the watershed. This results in development that can cause environmental impacts on the streams of the watershed. This is a community-based program.

Goal: Work to coordinate the zoning processes of the affected townships and counties.

Goal Description	Fund Source	Timeline	Partners
Work to coordinate the zoning processes of the affected townships and counties.	Local Funds	2005 to current	Clinton County Regional Planning Commission

Sub-Basin Wide Issues

East Fork of the Todd's Fork
HUC: 05090202_080_010

Problem #1: The IWB2 score of the East Fork of the Todd's Fork is below attainment status. The chemical data analysis shows that phosphorus exceeds proposed limits. Plus, agricultural-related nutrient loading has been identified as a problem throughout the watershed. Therefore, lowering of the phosphorus levels in the stream could help improve the IWB2 score and help the stream reach use-attainment.

Goal: Apply agricultural BMP's targeted to reduce phosphorus loading by 15% (9000 lbs/yr, see Table 2, page 19, for initial loading numbers)

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's targeted to reduce phosphorus loading by 15% (9000 lbs)	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Warren, Clinton SWCD's

Problem #2: Large numbers of failing home sewer treatment systems around Mainsville. This is leading to leaching of nutrients into local ground and stream systems.

Goal: A new waste water treatment plant is being planned and built to address the failing home sewer septic systems in the area.

Todd's Fork, Lower River Section
HUC: 05090202_080_020

Problem #1: The IWB2 score for River Mile 2.6 of the Todd's Fork is below attainment status. It is known from chemical data that phosphorus and total nitrogen are significantly above recommended levels. Phosphorus and nutrient enrichment from agricultural and municipal sources are known to be causing an impact in that area. The River Mile 2.6 sample site is also below the confluences of the Lick Run (HUC: 05090202_080_030) and Second Run (HUC: 05090202_080_040). Impacts from these streams might also be causing a problem at this point in the river.

Goal #1: Apply agricultural BMP's targeted to reduce phosphorus loading by 10% (2600 lbs/yr, see Table 2, page 19, for initial loading numbers)

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's targeted to reduce phosphorus loading by 10% (2600 lbs)	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006-current	Warren, Clinton SWCD's

Goal #2: Work with the City of Morrow to identify and mitigate municipal nutrient sources.

Goal Description	Fund Source	Timeline	Partners
Work with the City of Morrow to identify and mitigate municipal nutrient sources.	?	?	?

Goal #3: Address water quality problems of Lick Run (HUC: 05090202_080_030) to reduce its impact on the Todd's Fork.

Goal Description	Fund Source	Timeline	Partners
Address water quality problems of Lick Run (HUC: 05090202_080_030) to reduce its impact on the Todd's Fork.	?	?	?

Goal #4: Address water quality problems of Second Creek (HUC: 05090202_080_040) to reduce its impact on the Todd's Fork.

Goal Description	Fund Source	Timeline	Partners
Address water quality problems of Second Creek (HUC: 05090202_080_040) to reduce its impact on the Todd's Fork.	?	?	?

Problem #2: Some entrenchment of the Todd's Fork occurs by the mouth to the Little Miami River. This could cause use-attainment issues in the future.

Goal: Determine extent, cause, and impact of entrenchment around the mouth to the Little Miami River.

Goal Description	Fund Source	Timeline	Partners
Determine extent, cause, and impact of entrenchment around the mouth to the Little Miami River.	?	?	?

Lick Run
HUC: 05090202_080_030

Problem #1: The IWB2 score for Lick Run is below attainment status. It is known that there are impacts from loss of riparian cover, nutrient loading from agricultural and residential areas, canalization of the streams, animal waste deposition and siltation.

Goal #1: Apply agricultural BMP's targeted to reduce nutrient loading, increase riparian cover, animal waste deposition and siltation. (Due to lack of chemical data no numeric target could be determined)

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's targeted to reduce nutrient loading, increase riparian cover, animal waste deposition and siltation.	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	Clinton, Warren SWCD's

Goal #2: Apply residential BMP's to reduce nutrient loading, increase riparian cover and canalization.

Goal Description	Fund Source	Timeline	Partners
Apply residential BMP's to reduce nutrient loading, increase riparian cover and canalization.	?	?	?

Problem #2: The watershed has soils that are poor for home waste water treatment systems.

Goal: Create a monitoring and maintenance program for Home Sewer Treatment Systems in the watershed.

Goal Description	Fund Source	Timeline	Partners
Create a monitoring and maintenance program for Home Sewer Treatment Systems in the watershed.	Local Funds	2005 to 2006	1. Warren County Health Department 2. LMRP

Second Creek
HUC: 05090202_080_040

Problem #1: It is known that there are impacts from loss of riparian cover, nutrient loading from agricultural and residential areas, canalization of the streams, animal waste deposition and siltation.

Goal #1: Apply agricultural BMP's targeted to reduce nutrient loading, increase riparian cover, animal waste deposition and siltation. (Due to lack of chemical data no numeric target could be determined)

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's targeted to reduce nutrient loading, increase riparian cover, animal waste deposition and siltation.	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	Clinton, Warren SWCD's

Goal #2: Apply residential BMP's to reduce nutrient loading, increase riparian cover and canalization.

Goal Description	Fund Source	Timeline	Partners
Apply residential BMP's to reduce nutrient loading, increase riparian cover and canalization.	?	?	?

Problem #2: The watershed has soils that are poor for home waste water treatment systems.

Goal: Create a monitoring and maintenance program for Home Sewer Treatment Systems in the watershed.

Goal Description	Fund Source	Timeline	Partners
Create a monitoring and maintenance program for Home Sewer Treatment Systems in the watershed.	Local Funds	2005 to 2006	1. Warren County Health Department 2. LMRP

First Creek
HUC: 05090202_080_050

Problem #1: It is known that there are impacts from loss of riparian cover, nutrient loading from agricultural and residential areas, canalization of the streams, animal waste deposition and siltation.

Goal #1: Apply agricultural BMP's targeted to reduce nutrient loading, increase riparian cover, animal waste deposition and siltation. (Due to lack of chemical data no numeric target could be determined)

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's targeted to reduce nutrient loading, increase riparian cover, animal waste deposition and siltation.	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	Clinton, Warren SWCD's

Goal #2: Apply residential BMP's to reduce nutrient loading, increase riparian cover and canalization.

Goal Description	Fund Source	Timeline	Partners
Apply residential BMP's to reduce nutrient loading, increase riparian cover and canalization.	?	?	?

Problem #2: The watershed has soils that are poor for home waste water treatment systems.

Goal: Create a monitoring and maintenance program for Home Sewer Treatment Systems in the watershed.

Goal Description	Fund Source	Timeline	Partners
Create a monitoring and maintenance program for Home Sewer Treatment Systems in the watershed.	Local Funds	2005 to 2006	1. Warren County Health Department 2. LMRP

Todd's Fork, Upper River Section
HUC: 05090202_070_010

Problem #1: Agricultural practices are known to be having an impact on water quality.

Goal: Apply agricultural BMP's to help mitigate agricultural practices damage to water quality. (Due to lack of chemical data no numeric target could be determined)

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's to help mitigate agricultural practices damage to water quality.	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	Clinton, Warren SWCD's

Problem #2: Urban pressures are known to be having an impact on water quality.

Goal: Determine urban pressures and apply mitigation activities to address water quality impacts.

Goal Description	Fund Source	Timeline	Partners
Determine urban pressures and apply mitigation activities to address water quality impacts.	?	?	?

Problem #3: Land Use Disposal and developmental pressures are causing increasing water quality problems.

Goal: Apply zoning and developmental regulations to mitigate water quality problems associated with urbanization.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with urbanization.	?	?	?

Dutch Creek
HUC: 05090202_070_020

Problem: The IBI score for Dutch Creek is below attainment status. Developmental pressures, particularly in the upper Dutch Creek are causing loss of riparian cover and other damage to the stream.

Goal: Protect or restore the riparian zones of the upper Dutch Creek.

Goal Description	Fund Source	Timeline	Partners
Protect or restore the riparian zones of the upper Dutch Creek.	?	?	Clinton Stream Keepers

Lytle Creek
HUC: 05090202_070_030

Problem: The IWB2, from mouth to source, and IBI and ICI, from River Mile 13.3 to source are below attainment status. The only tributary (River Mile 9.75) sampled has IBI below attainment status. It is known from chemical data that phosphorus and total nitrogen are significantly above recommended levels. In addition there is evidence that there are numerous other impact sources: de-icing chemicals from the ABX Airport, agricultural and municipal nutrient enrichment, urban uses, land use disposal and developmental pressures and heavy impacts from the City of Wilmington and impervious surfaces.

Goal #1: Implement agricultural BMP's to reduce phosphorus loading by 10% (1000 lbs/yr, see Table 2, page 19, for initial loading numbers)

Goal Description	Fund Source	Timeline	Partners
Implement agricultural BMP's to reduce phosphorus loading by 10% (1000 lbs)	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	1. Clinton, Warren SWCD's 2. Clinton Stream Keepers

Goal #2: Determine sources and apply mitigation practices to municipal nutrient sources.

Goal Description	Fund Source	Timeline	Partners
Determine sources and apply mitigation practices to municipal nutrient sources.	?	?	Clinton Stream Keepers

Goal #3: Determine the impact of the de-icing chemical catch basins on the Lytle Creek.

Goal Description	Fund Source	Timeline	Partners
Determine the impact of the de-icing chemical catch basins on the Lytle Creek.	?	?	Clinton Stream Keepers

Goal #4: Determine the impacts caused by urban uses on the Lytle Creek and develop and apply a mitigation plan.

Goal Description	Fund Source	Timeline	Partners
Determine the impacts caused by urban uses on	?	?	Clinton Stream Keepers

the Lytle Creek and develop and apply a mitigation plan			

Goal #5: Apply zoning and developmental regulations to mitigate water quality problems associated with urbanization.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with urbanization.	?	?	Clinton Stream Keepers

Goal #6: Protect or restore the riparian zones of the Lytle Creek.

Goal Description	Fund Source	Timeline	Partners
Protect or restore the riparian zones of Lytle Creek	1. Local Funds 2. Organizational Funds 3. Grants	?	1. Lytle Creek League of Conservators 2. Clinton Stream Keepers

Goal #7: Provide education to businesses, developers, and communities on possible alternatives and impacts of impervious surfaces.

Goal Description	Fund Source	Timeline	Partners
Provide education to businesses, developers, and communities on possible alternatives and impacts of impervious surfaces.	1. Grants 2. Local Funds 3. Organizational Funds	2005 to current	Clinton Stream Keepers

Cowan Creek, Upper Stream Section
HUC: 05090202_070_040

Problem #1: The IWB2, from mouth to source, and IBI and ICI, from River Mile 13.3 to source are below attainment status on this section of Cowan Creek. It is known from chemical data that phosphorus and oxygen depletion are significantly above recommended levels. In addition there is evidence that there are numerous other impact sources: de-icing chemicals from the ABX Airport, agricultural nutrient enrichment, industry uses, land use disposal, poor riparian habitat and canalization.

Goal #1: Implement agricultural BMP's to reduce phosphorus loading by 15% (6000 lbs/yr, see Table 2, page 19, for initial loading numbers)

Goal Description	Fund Source	Timeline	Partners
Implement agricultural BMP's to reduce phosphorus loading by 15% (6000 lbs)	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	1. Clinton, Warren SWCD's 2. Clinton Stream Keepers

Goal #2: Determine the impact of the de-icing chemical catch basins on the Cowan Creek.

Goal Description	Fund Source	Timeline	Partners
Determine the impact of the de-icing chemical catch basins on the Cowan Creek.	?	?	Clinton Stream Keepers

Goal #3: Determine the impacts caused by urban uses on the Cowan Creek and develop and apply a mitigation plan.

Goal Description	Fund Source	Timeline	Partners
Determine the impacts caused by urban uses on the Cowan Creek and develop and apply a mitigation plan	?	?	Clinton Stream Keepers

Goal #4: Determine the impacts caused by industrial uses on the Cowan Creek and develop and apply a mitigation plan.

Goal Description	Fund Source	Timeline	Partners
Determine the impacts	?	?	Clinton Stream Keepers

caused by industrial uses on the Cowan Creek and develop and apply a mitigation plan.			

Goal #5: Protect or restore the riparian zones of the Cowan Creek.

Goal Description	Fund Source	Timeline	Partners
Protect or restore the riparian zones of Cowan Creek.	?	?	Clinton Stream Keepers

Goal #6: Develop alternatives to canalization and riparian cover removal for ditch maintenance.

Goal Description	Fund Source	Timeline	Partners
Develop alternatives to canalization and riparian cover removal for ditch maintenance.	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to 2007	1. Clinton, Warren SWCD's 2. Clinton Stream Keepers

Problem #2: The IWB2, IBI, QHEI, and ICI, from mouth to source of Indian Run are significantly below attainment status. There is evidence that there are numerous impact sources: de-icing chemicals from the ABX Airport, agricultural nutrient enrichment, industry uses, land use disposal, poor riparian habitat and canalization, flow alteration by ABX Airport.

Goal #1: Implement agricultural BMP's to reduce nutrient enrichment.

Goal Description	Fund Source	Timeline	Partners
Implement agricultural BMP's to reduce nutrient enrichment.	1. Local Funds 2. FSA Program Funds 3. 319 Program	?	Clinton, Warren SWCD's

Goal #2: Determine the impact of the de-icing chemical catch basins on the Cowan Creek.

Goal Description	Fund Source	Timeline	Partners
Determine the impact of	?	?	?

the de-icing chemical catch basins on the Indian Run.			

Goal #3: Determine the impacts caused by industrial uses on the Indian Run and develop and apply a mitigation plan.

Goal Description	Fund Source	Timeline	Partners
Determine the impacts caused by industrial uses on the Indian Run and develop and apply a mitigation plan.	?	?	?

Goal #4: Protect or restore the riparian zones of the Indian Run.

Goal Description	Fund Source	Timeline	Partners
Protect or restore the riparian zones of Indian Run	?	?	?

Goal #5: Develop alternatives to canalization and riparian cover removal for ditch maintenance.

Goal Description	Fund Source	Timeline	Partners
Develop alternatives to canalization and riparian cover removal for ditch maintenance.	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to 2007	Clinton, Warren SWCD's

Goal #6: Determine the impact of the de-icing chemical catch basins on the Indian Run.

Goal Description	Fund Source	Timeline	Partners
Determine the impact of the de-icing chemical catch basins on the Indian Run.	?	?	?

Cowan Creek, Lower Stream Section (including Cowan Lake)
HUC: 05090202_070_050

Problem #1: The IWB2, from mouth to river mile 7.3, IBI, from mouth to river mile 8.4, and ICI, from river mile 6.6 to 7.3, of Cowan Creek are below attainment status. The chemical data analysis shows that phosphorus exceeds proposed limits. This is primarily due to agricultural impacts and land use disposal issues. Cowan Lake, which drains into Cowan Creek, has nutrient loading problems from local failing home sewer treatment systems.

Goal #1: Implement agricultural BMP's to reduce phosphorus loading by 10% (1400 lbs/yr, see Table 2, page 19, for initial loading numbers)

Goal Description	Fund Source	Timeline	Partners
Implement agricultural BMP's to reduce phosphorus loading by 10% (1400 lbs)	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Clinton, Warren SWCD's

Goal #2: Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.	?	?	?

Goal #3: Develop and apply a home sewer treatment system plan to address the failing home systems around Cowan Lake.

Goal Description	Fund Source	Timeline	Partners
Develop and apply a home sewer treatment system plan to address the failing home systems around Cowan Lake.	?	?	?

Problem #2: The IWB2 of Wilson Creek is below attainment status. High levels of phosphorus have been detected and agricultural impacts have been determined to have caused problems. Land use disposal issues could also have additional impacts on water quality.

Goal #1: Apply agricultural BMP's to reduce agricultural impacts on the stream.

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's to reduce agricultural impacts on the stream.	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Clinton, Warren SWCD's

Goal #2: Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.	?	?	?

Todd's Fork, Central Stream Section
HUC: 05090202_070_060

Problem #1: The IWB2 of the Todd's Fork at River Mile 20.30 is below attainment status. The chemical data analysis shows that phosphorus exceeds proposed limits. Impacts on local stream health occur from agricultural and urban impacts and land use disposal.

Goal #1: Implement agricultural BMP's to reduce phosphorus loading by 10% (1700 lbs/yr, see Table 2, page 19, for initial loading numbers)

Goal Description	Fund Source	Timeline	Partners
Implement agricultural BMP's to reduce phosphorus loading by 10% (1700 lbs)	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Clinton, Warren SWCD's

Goal #2: Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.	?	?	?

Goal #3: Determine the impacts caused by urban uses on the Todd's Fork and develop and apply a mitigation plan.

Goal Description	Fund Source	Timeline	Partners
Determine the impacts caused by urban uses on the Todd's Fork and develop and apply a mitigation plan	?	?	?

Problem #2: Phosphorus levels are above recommended levels at River Mile 15.7 and could affect use-attainment status. Sources could be from agricultural impacts and municipal sources associated with Lytle Creek.

Goal #1: Apply agricultural BMP's to reduce agricultural impacts on the stream.

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's to reduce agricultural impacts on the stream.	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Clinton, Warren SWCD's

Goal #2: Address water quality problems of Lytle Creek (HUC: 05090202_070_030) to reduce its impact on the Todd's Fork.

Goal Description	Fund Source	Timeline	Partners
Address water quality problems of Lytle Creek (HUC: 05090202_070_030) to reduce its impact on the Todd's Fork.	?	?	?

Problem #3: The IWB2 and QHEI of the Moore Branch are below attainment status. Impacts on local stream health occur from agricultural impacts and land use disposal.

Goal #1: Apply agricultural BMP's to reduce agricultural impacts on the stream.

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's to reduce agricultural impacts on the stream.	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Clinton, Warren SWCD's

Goal #2: Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.	?	?	?

Problem #4: The IWB2 of the Little Creek is below attainment status. Impacts on local stream health occur from agricultural impacts and land use disposal.

Goal #1: Apply agricultural BMP's to reduce agricultural impacts on the stream.

Goal Description	Fund Source	Timeline	Partners
Apply agricultural BMP's to reduce agricultural impacts on the stream.	1. Local Funds 2. FSA Program Funds 3. 319 Program	2006 to current	Clinton, Warren SWCD's

Goal #2: Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.

Goal Description	Fund Source	Timeline	Partners
Apply zoning and developmental regulations to mitigate water quality problems associated with land use disposal.	?	?	?

CHAPTER 6: WATERSHED ACTION PLAN EVALUATION

The watershed action plan needs to have a definite process by which the implementation and planning that is being carried out is determined to have an impact on the water quality of the Todd's Fork watershed. All implementation is aimed at improving stream use-attainment for complying with Ohio EPA's interpretation of the Federal Clean Water Act.

Listed in Table 38 are the processes that will be used.

	Y	N	?	Comments
Set of criteria that can be used to determine if loading reductions are being achieved over time & substantial progress is being made towards attaining water quality standards, and, if not, the criteria for determining if this watershed-based plan (or incorporated TMDL recommendations) needs to be revised.	X			1. STEPL and other ODNR/OEPA approved calculation methods will be used to determine the theoretical impact of a project 2. Biological and Habitat sampling and analysis will be completed by Tier 3, OEPA-approved, professionals to determine stream use-attainment status and potential problems. The extent of sampling will be based upon funding, but should include before implementation and a year post-implementation sampling. 3. Chemical sampling and analysis will be completed by Tier 3, OEPA-approved professionals, when a stream is not in use-attainment or when a chemical issue has been addressed by a project. The extent of sampling will be based upon funding, but should include before implementation and a year post-implementation sampling.
Easy tracking of plan's progress. Who will monitor plan progress? How? How will plan progress be publicized to officials & public? Are there adequate resources to monitor progress? What time frame will likely occur before progress is discernable? What surrogates of water quality progress will be tracked & reported? By whom to	X			1. The Little Miami River Partnership (LMRP) will monitor the plans progress, based upon funding. 2. LMRP will monitor progress by accumulating the information form its partners on their implementation projects. 3. The data on implemented projects will be added to an Accomplishments Appendix section of the watershed action plan. 4. Local and regional press will be informed and briefed on successful projects. 5. Public meetings and educational programs will be developed, where appropriate and funding allows, providing details about projects. 6. Information packets will be developed on projects, where appropriate and

whom? At what point will the success or lack of progress on certain objectives call for a revision of implementation strategy?				funding is available, to local and regional elected officials. 7. Evaluations and data from projects will be provided to interested ODNR and OEPA officials, as well as put into the current watershed action plan. 8. If a plan is implemented and no discernable impact to use-attainment or education levels is determined, similar projects and approaches will be re-evaluated.
Highlighting of successful activities as well as showing which activities not to repeat in same manner.	X			1. Successful projects will be evaluated to see if the same process can be used with other similar projects. 2. The data on implemented projects will be added to an Accomplishments Appendix section of the watershed action plan. 3. Local and regional press will be informed and briefed on successful projects. 4. Public meetings and educational programs will be developed, where appropriate and funding allows, providing details about projects. 5. Information packets will be developed on projects, where appropriate and funding is available, to local and regional elected officials. 6. Evaluations and data from projects will be provided to interested ODNR and OEPA officials, as well as put into the current watershed action plan. 7. If a plan is implemented and no discernable impact to use-attainment or education levels is determined, similar projects and approaches will be re-evaluated.
Substantive &/or methodological knowledge of processes & programs.	X			1. As projects are developed and implemented, they will be researched and vetted by professionals. Any new methodologies and processes developed through the development and implementation process will be provided to the watershed community. 2. LMRP staff will continue an aggressive staff education process, funding permitting, in order to develop staff knowledge current and applicable methodologies to use for project development and implementation sampling.
Monitoring component to evaluate effectiveness of implementation efforts over time, measured against	X			1. Biological and Habitat sampling and analysis will be completed by Tier 3, OEPA-approved, professionals to determine stream use-attainment status and potential problems. The extent of sampling will be based upon funding, but

the set of criteria used to determine if loading reductions are being achieved (i.e., first box above).				should include before implementation and a year post-implementation. 2. Chemical sampling and analysis will be completed by Tier 3, OEPA-approved professionals, when a stream is not in use-attainment or when a chemical issue has been addressed by a project. The extent of sampling will be based upon funding, but should include before implementation and a year post-implementation sampling.

Table 38. Evaluation Criteria for the Todd's Fork Watershed Action Plan.

APPENDICES

Appendix One

Bylaws
of the
Little Miami River Partnership

I. ARTICLE – NAME

The name of this organization shall be the ***Little Miami River Partnership*** and shall also be known as the ***LMRP***.

II. ARTICLE – GENERAL PURPOSE

The mission of the Little Miami River Partnership is to coordinate and support efforts to maintain and improve the natural integrity of the Little Miami River watershed. The primary objectives of the LMRP are to:

1. Educate the Little Miami River Partnership membership regarding activities and research within the watershed.
2. Educate the public about the river system, its functions, values and watershed.
3. Review, present, and coordinate research activities.
4. Advocate and actively support research and other activities that further the mission of the LMRP.
5. Recognize outstanding efforts in the watershed.
6. Promote sustainable land use planning and practices.
7. Design and promote long term strategies that help achieve environmental and economic sustainability and a high quality of life.

III. ARTICLE– NATURE

This organization is formed as a partnership, joining together individuals, businesses, agencies, organizations, institutions, corporations, and governmental units with the common mission and purpose of the LMRP. This organization shall be a not for profit organization and is formed exclusively for educational, scientific, and testing for public safety purposes within the meaning of section 501 (C) (3) of the Internal Revenue Code. The LMRP may endorse issues pertaining to the Little Miami River watershed. The LMRP shall be non-political and shall not be used for personal gain by its individual members.

IV. ARTICLE– FISCAL YEAR

The fiscal year of the organization shall begin the 1st day of January in each calendar year.

V. ARTICLE– MEMBERSHIP

Membership and voting privileges may be extended to any individuals, agencies, businesses, organizations, institutions, corporations, or governmental units interested in

promoting the common mission and purpose of the Little Miami River Partnership. A member in good standing is current in their dues the first of the month in which the dues were paid.

1. Membership in the LMRP will commence with the issuance of a membership card by the Treasurer, effective the date of receipt of payment of dues.
2. Each membership shall be entitled one vote. Corporate membership agreements shall designate a voting representative for that corporation.
3. Each member shall have the privilege to nominate and elect board members, vote on bylaw amendments, articles of incorporation, and dues. Each member may bring forth issues related to the mission, purpose, function, and funding of the LMRP to the Board of Directors and LMRP.
4. Membership may be revoked for just cause as determined by a two-thirds (2/3) majority vote of the Board of Directors and a simple majority vote of the members present at the next scheduled meeting.

VI. ARTICLE– DUES

Dues shall be recommended by the Board of Directors and approved by a simple majority vote of the members present. Dues shall be renewed annually and payment will be due in full the first of the month in which the dues were paid. New members shall be required to make payment in full with submission of application.

VII. ARTICLE– MEETINGS

1. ***Annual Meeting*** shall be held during the last quarter of the fiscal year.
2. ***Regular meetings*** shall be conducted quarterly with dates to be set at the Annual Meeting for the next year.
3. ***Special meetings*** may be scheduled by the President and/or Board of Directors. The Secretary shall send out notices of special meetings to each member marked two weeks in advance.

During any meeting, a quorum shall be required to conduct business. A quorum is defined as 51% of the Board of Directors. Passing a motion shall require a simple majority of the voting members present.

VIII. ARTICLE– BOARD OF DIRECTORS

There shall be a Board of Directors of nine (9) members elected:

1. - At-large member
2. - At-large member
3. - At-large member
4. - At-large member
5. – Member of Upper Little Miami Committee
6. – Member of Caesar Creek Committee
7. – Member of Todd's Fork Committee
8. - Member of East Fork Committee
9. – Member of Lower Little Miami Committee

Upon the adoption of these By-laws, members 1, 2, and 5 shall be elected for a one-year term, members 3, 6, and 7 shall be elected for a two-year term, and members 4, 8, and 9 shall be elected for a three year term. Thereafter all these positions shall be elected to

serve a three-year term that shall begin at the close of the Annual Meeting and end at the following Annual Meeting three years later.

Membership of the Board of Directors shall consist of one member elected to represent each of the five standing subwatershed committees; Upper Little Miami, Caesar Creek, Todd's Fork, East Fork, and Lower Little Miami. See Article X for more details.

A quorum shall be required to conduct business at all board meetings. A quorum is defined as 51% of the Board of Directors. A majority vote of the Board of Directors shall be required to pass a motion.

When a vacancy on the Board exists, nominations for new members may be received from present Board members by the Secretary two weeks in advance of a Board meeting. These nominations shall be sent out to Board members with the regular Board meeting announcement, to be voted upon at the next Board meeting. These vacancies will be filled only to the end of the Board member's term.

Resignation from the Board must be in writing and received by the Secretary.
A board member shall be dropped for excess absences from the Board if he/she has three unexcused absences from Board meetings on a year. A Board member may be removed for other reasons by a two-thirds (2/3) majority vote of the Board of Directors and a simple majority vote of the members present at the next scheduled full LMRP meeting.

IX. ARTICLE – OFFICERS AND DUTIES

Officers of the LMRP shall serve one (1) year terms. These officers shall be nominated and elected by a majority vote of the Board of Directors at the first board meeting following the Annual Meeting. In the case of death, resignation or inability to continue as an officer, the Board of Directors may declare the office vacant and appoint his/her successor.

President – Nominees for president shall consist of one or more of the members who are currently serving of the Board of Directors. Duties of the president shall be to determine the regular meeting schedule, preside over all meetings of the LMRP, call special meetings of the LMRP and Board of Directors, determine agendas for meetings, appoint committees, perform all acts and duties usually performed by an executive or presiding officer, and sign all membership agreements and other such papers of the LMRP as he/she may be authorized to sign by the Board of Directors or LMRP on its behalf.

Vice President – Nominees for vice president shall consist of one or more of the members who are currently serving on the Board of Directors. The vice president shall perform the duties of the president in his/her absence. Duties of the vice president shall also include directing the activities of all LMRP committees.

Treasurer - Nominees for treasurer shall consist of one or more of the members who are currently serving of the Board of Directors. The treasurer shall have general charge and supervision of the LMRP's financial records. He/she shall be responsible for handling receipts and disbursements of all monies of the LMRP. He/she shall serve, mail, or deliver all notices required by law and these bylaws. He/she shall make a full report of all matters and business pertaining to the office to the members at the Annual Meeting or at such other times as the president directs him/her to do so. He/she shall make all reports as required by law and perform other such duties as required by the LMRP. Upon election of a successor, the treasurer shall turn over all books and other property belonging to the LMRP that he/she may have in his/her possession. The treasurer shall cooperate with the president in an audit of the financial records.

Secretary – Nominees for secretary shall consist of one or more of the members who are currently serving on the Board of Directors. The secretary shall keep a complete record of all meetings of the LMRP and update the membership roster as needed. He/she shall be responsible for notifying the membership and invited guests as to upcoming meetings. He/she shall make minutes available to all members. He/she is also to mail a summary of minutes from each meeting to the membership before the meeting that is scheduled to follow. He/she shall attest the president's signature on all necessary documents and papers pertaining to the LMRP. He/she shall serve, mail or deliver all notices required by law and these bylaws and shall make a full report of all matters and business pertaining to this office to the members at the Annual Meeting or at such other times as the president directs him/her to do so. He/she shall make all reports as required by law and perform other such duties as required by the LMRP. Upon election of a successor, the secretary shall turn over all books and other property belonging to the LMRP that he/she may have in his/her possession.

X. ARTICLE– SUBWATERSHED COMMITTEES

In order to promote local action throughout the watershed the LMRP has created five subwatershed representative board positions that represent the major subwatersheds of the Little Miami River watershed. These include: Upper Little Miami, Caesar Creek, Todd's Fork, East Fork, and Lower Little Miami. To be a subwatershed representative of one of these five subwatersheds a LMRP member must either live in or have a demonstrated responsibility within that subwatershed.

XI. ARTICLE -OTHER COMMITTEES

Nominating Committee: The president shall appoint a Nominating Committee annually to prepare and present a slate of board candidates for approval for any vacant at-large positions on the board. At the time of the selection, additional nominations from the

floor can be accepted. The four at-large members shall be elected to the Board of Directors by a simple majority of members present at the Annual Meeting.

Finance Committee. The Treasurer is chair of the Finance Committee, which includes three other Board members. The Finance Committee is responsible for developing and reviewing fiscal procedures, a fundraising plan, and annual budget with staff and other Board members. The Board must approve the budget, and all expenditures must be within the budget. The Board must approve any major change in the budget. The committee shall prepare a report attesting to the financial condition of the LMRP as of January 1, for the preceding year, and shall submit the report to the President of the LMRP prior to the annual meeting for attachment to the Annual Treasurer's Report. The financial records of the organization are public information and shall be made available to the membership, Board members and the public.

The Board of Directors may appoint such other Standing or Ad-Hoc committees as deemed necessary to support the efforts of the LMRP.

XII. ARTICLE– AMENDMENTS

Proposed amendments to the By-laws shall be presented in writing to each member of the Board of Directors at least thirty (30) days prior to the Board of Directors' Meeting at which the amendment is proposed to be adopted. An affirmative vote of two-thirds (2/3) of the Board of Directors shall be necessary for adoption of amendments to the By-laws. When the Board of Directors has approved amendments to the By-laws, they shall be submitted to the membership of the LMRP for a simple majority approval at the next meeting.

I. ARTICLE– DISSOLUTION

In the event of dissolution of the Little Miami River Partnership the remaining assets of the LMRP, after the satisfaction of all obligations, shall be distributed for purposes within the scope of Internal Revenue Service Code 501 (C) (3), or amendments thereof.

We certify that the members duly adopted the foregoing bylaws on

_____, 20___, and that the same is in full force and effective and has not yet been amended.

Given under our hands this _____day of _____. 20_____

_____ _____

President Secretary

Appendix Two

Community Input Data

Todd's Fork Brain-Storming Notes and Summaries

Question #1: " What do you see as the current condition of the environment in the Todd's Fork Watershed. Please think of both good and bad conditions."

Orange Group

Positive (+) Condition	Negative (-) Condition
Primarily Rural	Fishing and swimming regulations
Should keep watch as sewer wastes going into streams that empty into Todd's Fork I don't know how "clean" this "is" now. Future building should be checked.	Growth that appears uncontrolled
Protecting the diversity of wildflowers	Lack of public knowledge watershed
Generally good water quality	Airport de-icing runoff – Wilmington area
Protecting the diversity of wildlife	Should have people who will inform to the EPA any trouble spots along the stream. Such as fish kills
Population increase impacts the values that people bring here	Muskrat dams and damage to shore line
Airborne express needs to be part of this process	Fill up with sedimentation affects gradient
	Algae bloom control disturbs ecological balance
	Lack of a watershed coordinator
	Stream bank management
	Development impact due to lack of education for adjacent landowners (ie mulching thrown in creek, mowing to bank, etc)
	Log jams
	Over several years shorebird life has declined
	Animal waste run-off – limited amounts
	Increasing development pressure
	Lack of W.Q. standards
	It seems better than some – should be cleaned up along the way, like the "clean up days" in the Little Miami. It needs to be kept clean.
	Any navigable areas not accessible to public. Missing recreational opportunities.
	Ag – runoff – dissolved ie NO3, NO2, HN3, pesticides, ie
	Public water supply extends beyond central

	sewers
	No zoning in many townships
	Invasive plants
	Airborne and R&L Trucking
	Accelerated erosion from development
	Waste water city & villages
	Some smaller tributaries are impacted by human activities

Green Group

Positive (+) Condition	Negative (-) Condition
Scenic river front forested corridor along mainstream	Current conditions vary from location to location!
Very Scenic river	Storm Water Runoff
Todd's Fork – the water is "inviting" swimmers	Large increase of housing construction in rural areas including prime farm land areas going into housing
Great Sailing at Cowan Lake and canoeing (swimming/fishing)	New development may create problems
Increased amount of non-prime farmland going back to trees (increased deer population, reintroduction of turkey).	Increasing amount of land going under asphalt
Lots of Agriculture	Increasing impact from storm water runoff
More conservation practices, such as waterways	Erosion – also a new development concern. Can we control? Scenic River Status? We should go for it. Current – not as healthy as it was 10 years ago when we built on the creek. (Since Sycamore Creek Development upstream)
Less erosion from no-till farms	Ponquite Run – trash in high water as it moves down stream!
Improved conditions in Clarksville. New sewer.	Issue with leachate from old, buried gasoline tanks
Increase percentage of farm lands going into no-till production	Industrial pollution run-off problems from some of the larger towns and cities
Increased large percentage of corn and soybeans going into GMO crop	Lytle Creek is still polluted stream (Airborne)
Greatly decreased percentage of livestock on farms in last 20 years. Less grassland. Less manure runoff.	Airborne pollution
Current conditions vary from location to location!	Septic waste
	Poor condition around Martinsville and Midland due to failing septic systems.

	Agricultural sludge. Heavy metals
	Farming fertilizers. Silt

Red Group

Positive (+) Condition	Negative (-) Condition
Well spread communities along the river	Attractive for Development
Changes in farming practices (minimum till and no-till)	Cowan Lake is muddy all the time!
Ag conservation in watershed	Sewage (sludge) from other areas dumped on our fields.
Landowners	Failing septic systems – nutrient loading from septic systems, agriculture
Easy and quick access to fine parks with great facilities	Can there be better efforts to control the silt into Todd's Fork?
Free flowing	Heavy Silt and nutrient loading
Many small mouthed bass are present. This is a good sign.	Filling in of flood plain
Overall good water quality	Human failure
Water quality is good along main branch	Evidence of people dumping tires and other trash in some areas
Clean water	It is challenging to find an area of solitude – noise pollution is everywhere
Recreational opportunities/eco-tourism – canoe trips. Fishable, swimable water	Sale/Development/Conversion of land use from rural/ag. To residential communities – mindset/perception that development is not a potential detriment to Todd Fork WQ
Change in pesticides (more environmental friendly)	Urban Sprawl (Zoning Practices)
More community awareness	Urban Sprawl
Glad Airborne put in retention ponds to control de-icing	Lack of sewage systems in small villages along and in the watershed
Wonderful education site	Lytle Creek
Still rural landscape	Establish no salt areas on roads close to the main stream along Todd's Fork
Picturesque	Industrial Impact
Rural integrity largely intact throughout watershed and along Todd Fork	Need for better communication of access to Todd's Fork stream. What are the guidelines?
Wildlife Diversity and Aquatic Diversity	Sections of Todd's Fork thru farms have no riparian cover.
High populations of herps	Stream samples on a section to Todd's Fork road is severely eroded but good moorors.

Diverse communities	
High quality/intact/contiguous/ riparian/streamside vegetation/habitat	
Attractive for development	

White Group

Positive (+) Condition	Negative (-) Condition
Natural Beauty	Growing population
Beautiful landscape	Local conditions can be very bad
Provides recreation swimming, fishing	Lots of development going on in some areas which cause excessive water runoff
Increasing wildlife	Point and non-point pollution – sludge (Grade B), solid, liguid
Have seen people fishing	Contaminants draining into river
Relatively clean	Lytle Creek is in bad shape, worse every year, factorys and Airborne
Water quality is such that it allows little children to play and swim in	Threatened by development leading to massive stream bank erosion, flash flooding and worsened water quality
Trees line the banks in most places	Continuing rapid development may have adverse affect without conservation practices
Growing population	Growing number of industries
Local conditions can be very good	Fish decrease
There a lot of small streams that run into Todd Fork	Wildlife decrease
Cowan Creek – seems good?	

Yellow Team

Positive (+) Condition	Negative (-) Condition
Stream have improved due to no till farming	Increasing no-till and reduced till farming – greater runoff, greater herbicides conc in streams
Lytle Creek is cleaner and has more oxygen than it was and had five years ago	Lytle Creek is still a challenge. Particularly storm water from Wilmington
Quality of Lytle Creek has improved due to better controls in Wilmington	Development is probably increasing peak to minimum stream flows
Does seem to be strong public awareness of conservation issues and at least lip service	Increasing development on septic lots
Waste management seems adequate between private and county agents	Building and development is uncontrolled

Cowan Creek has a park and a constituency interested in a linear park	Fish/Animals no longer present
Todd's Fork is relatively pristine and has many fine homes along it.	We think swimming in the streams may not be safe at present
The old Pennsylvania railroad bed can provide public access to Lytle Creek and Todd's Fork,	Poor roads and traffic signal synchronization increasing air pollution because of increased idling time
More no-till farming practices – cleaner run off	More no till farming practices – faster run off
Marginal water supplies and sewer systems – Tends to slow rampant development	Unbalanced wildlife population. Few predator species
Northern part of watershed permeable soil types	Poorly designed and (working) private systems drain into streams
	Southern part of watershed impermeable soil types

I don't know – I only see a small part of it. Who can honestly say they know anything about all of it?
Several new species of animals have appeared. To early to tell – Good/Bad
Once Lytle Creek was one of the best fishing streams in OH. Can it be that way again? That would be wonderful.

"Lost Stickers"

Positive (+) Condition	**Negative (-) Condition**
Lytle Creek now has some minnows in it.	Ag – runoff – sediment from worked ground
	Development can bring more sewage troubles – more eutrophication
	Development will bring loss of fish – populations, quality, diversity
	Landfills? Gravel Mining?
	More Highways and Bridge Crossings

Question #2: "What are the current environmental issues you see facing the watershed? And who do you think has responsibility or the ability to address that issue?"

Orange Group

Grouping	Issue	Responsibility
Urbanization	Can Todd's Fork handle urbanization	Township Trustees County Commissioners
	Encroaching population and development	Local residents Political appointees
	Population growth faster than infrastructure	Local jurisdiction OEPA
	Need for county-based planning	Local jurisdiction
Planning	Need for conservation planning at all levels	Local jurisdictions
Data	Comparison data 100 years ago today future	
	Stream Health	EPA Co. Soil and Water
	Not enough known what damage is actually occurring due to the environment needs studying	
	Is there baseline data on the pollutant level of Todd's Fork?	Latest study of EPA on Todd's Fork
Impervious Surfaces	Potential impact of by-pass	Clinton Co. Commissioners
	Inevitable increase of impervious surfaces	Building/Zoning Boards SWCD Offices OEPA II, Phase II
Runoff – Agricultural	Stream bank erosion	Soil and Water EPA "Watershed Manager"
	Agricultural Runoff and resulting stream degradation	USDA-NRCS Individual Landowners Producers
	Agricultural Practices Impact	Soil and Water EPA "Watershed Manager"
	Sediment from surrounding land	Soil and Water Education
Industrial Pollution	Deal with contamination and pollution (industrial)	EPA County Soil and Water

	Industrial Contamination	Soil and Water EPA "Watershed Manager" Local Industry
Funding	Can resources be obtained to correct natural resource problems?	USDA? – existing programs – what are they?
Chemical Runoff	So many chemical in yards – farms, etc. Along streams wash into the water	
	Urban Runoff from developed areas	Phase II communities Developmental controls

Green Group

Grouping	Issue	Responsibility
Septic Systems	Septic waste Poor condition around Martinsville and Midland due to failing septic systems.	Local Government Community Township Trustees City Government County Agencies Elected Officials City Environmental Health City Commissioners County/City Health Depts. City Health Departments
	Scenic River Status	Us? Stream Keepers Org. Stream Keepers LMRP Dept. of Natural Resources
Agricultural Run off	Increase farmer awareness of the need for conservation practices and educate about possible assistance	Extension Soil and Water
	Ag Run off	Farmer EPA Farmer Organization Farmer Appropriate State Agency Coop Extension Soil and Water
Transportation	Road impact on environmental quality	County Commissioners

		Environmental Groups County Commissioners
Urbanization and Sprawl	Urbanization and Sprawl	Local/County Officials Communities
	Enacting Land Use Policy	County Commissioners Regional Planning Education – college and Universities
	Preserving Green Space	Citizen Land Trust Local Park Districts
Responsibility	Not Clear who is responsible for Scenic River ag/septic	
	Not Clear about what organizations listed do	
Monitoring	Monitoring and regulating water quality in stream	OEPA WWTP
Industrial Pollution	Industrial pollution run-off problems from some of the larger towns and cities Lytle Creek is still polluted stream (Airborne) Airborne pollution	EPA Local! Officials US EPA OEPA OEPA Fed EPA

Red Team

Grouping	**Issue**	**Responsibility**
Land Use	Urbanization	County Commissioners
	Over-Development	Township and County Government
	Urban Sprawl	Rural Zoning
	Parcelization and Development of Landscape	Zoning and County Officials
	Negative enviornmnetal impacts of urbanization – siltation, fertilizer loading. Loss of riparian/ wildlife habitat, stream water quality, temp	Developers Real Estate Agents Money-hungry exploiters Ignorant home buyers
Land Use - Social	Urbanization	?
	Wreckless societal trend of sprawl. Changing landscape from rural to	Community groups Township Trustees

	residential without parameters in place or enforced to reduce its environmental impact	County Commissioners State Regulation agencies State Government
	Flooding/Litter: "Mother Nature", Impervious surfaces, changing weather, items being wasted into water bodies	
Stewardship	Disconnected Ownership	Agrarian opportunities for more people/young people
	Socialization of our land base	Pride in ownership reconnection
	Stewards of Land – Too many takers and not enough givers	Education Industry Standards Religious Leaders Politicians Individuals
Nitrification - NPS	Nutrients causing algal growth in streams to increase	Agriculture Golf Courses Home landscape/gardens
	Sludge	EPA State
	Enforcement of sewage sludge applied on farm fields	No one claims responsibility
Transportation	Railroad carrying hazardous waste parallel to Cowan Creek	Railroad – allows cars to carry it ODT – permits railroads near creeks OEPA/Hazmat/Emergency Mgt – responsible for cleanup
	De-icing at Airborne	Airborne put in ponds but jury still out
Agriculture	Monoculture based land use	Putting true economics back into farming – all of us
	Agricultural Impact	Federal, State and local Soil and Water Districts (Money)
	Siltation in Cowan's Lake	Erosion from Agriculture and Development
	Erosion	Developers/Landowners who remove riparian zone Development – lack of

		erosion controls and impervious surfaces make creeks more flashy Livestock access to creeks
Education	Social: Litter. I know/think that conservation is taught in the classroom. Where is the disconnect?	Educators
	Education – still not enough people know the current conditions in their own back yards – definitely better, but …	Media Parents Friends Ohio Education Standards

White Team

Grouping	Issue	Responsibility
Industrial Pollution/ Contamination	ABX Airborne Pollution	City of Wilmington Health Department EPA
	Runoff/contaminants from Industry	Business Owners Government Industries
	Contamination	Industry EPA All of Us
	Household Chemicals getting into streams	Homeowners
Sewage	Untreated Sewage	Home Owners Businesses Farm Owners
Erosion/ Flooding	Soil erosion control measures	USDA NRCS SCS CRP Program waterways and other soil erosion control practices
	Erosion-Flooding-Sludge runoff	Farmers Property Owners Soil and Water Conser. Dist. County Engineers
Genetic Engineering	Genetic Engineering	
Development	Rapid Development	County Commissioners

	Poor locations for new homes	5 acre rule – Ohio Legislature
	Development	Planning – Outside experts Enforcement Local Interest Land owners
Enforcement	Who has responsibility?	EPA Health Department DNR
Runoff	Runoff from housing developments	Twp County City EPA

Yellow Team

Grouping	Issue	Responsibility
Pollution	Animal waste in stream from large farms	ODA OEPA
	Animal waste in stream from small farms	SW Conservation districts Health Departments EPA
	Waste coming into county (sludge)	Fire dep't gets calls on odor issues
	Road and Stream Litter	Careless people No restrictions
	Noise pollution from faulty or deliberately altered exhaust systems; also big car stereos	Police Enforce existing statutes
	Run off from Wilmington	City of Wilmington (Phase II)
	Sediment in streams from housing developments	Erosion sediment and control regs
	Sediment in streams from farms	Soil and Water Conservation Districts
	Sediment in streams from (5 acre lot) individual building	?
Sewer Systems	Water Treatment – lime	WWTP's
	Septic Leachate Health dept. in stream	Health dept
	Sewer system failure, dumping into streams	Health Dept EPA

	Inadequate sewage management (insufficient treatment before discharge	Caused by poor system design oversights; ineffective inspection, lack of design options accepted (eg. aerobic systems) Therefore it's the permitting agency
	Trespassing	Personal irresponsibility Solution – additional prosecution options for landowners? Don't know
	Lack of understanding as to what the problem really are	County Environment
	Cranes can be seen in lakes, ponds, rivers and streams	? Conservation groups
	Deer population out of control – 30 years ago there were no deer	?
	Predation/Destruction of cash crops, landscaping by protected wildlife	Slightly extended hunting season, increased limits – state regulation

"Lost Stickers"

Grouping	Issue	Responsibility
	Keeping watershed carrying clean water	Everybody's responsibility Federal State Private Funding
	Environment	Golf courses – their "chemicals" go into ground water and can get into drinking water

Overall Groupings (from meeting):

Data Collection
Air Pollution
Education
Sludge
Urbanization (sprawl)
Urbanization (impervious surfaces)
Industrial Pollution
Wildlife Damage
Recreation
Agricultural Runoff – Soil and Chemical
Litter
Funding
Lack of Enforcement
Urnban Runoff – Soil and Chemical
Septic and Household waste
Lack of Understanding of Issues
Current Conditions Vary
Agriculture in Transition – Currently Strong Agriculture Base
Natural/Scenic Beauty and Recreational Opportunities
Infrastructure Improvements
Stewardship
Noise Pollution
Preservation
Flooding
Erosion
Mining
Solid Waste
Dams

Meeting Notes
Land Use/Urbanization Meeting
Todd's Fork Watershed
July 24th, 2004

Three over-arching issues were determined:

1. Agricultural Runoff and Erosion
2. Conservation and Preservation
3. Stewardship

The participants determined the following underlying problems that help maintain or cause the issue:

Agricultural Runoff and Erosion

1. Positive: Application of new technology – new biotech measures – vertical tillage – higher C/S for Ag practice application – TSI should be increased
2. Great variety of practices available now!
3. Negative: To many tables $ specifics to get a person to put practices on the ground - CCC sign off person should be in FSA office or local NRCS office till may have too much money spent on non-farm practices
4. Some people do not try to prevent erosion
5. Rock checks and grass filter strips help prevent erosion
6. Chemical Runoff is a problem if over applied
7. Household products can be a problem for run-off also
8. Lawn applications when large amounts are applied. Especially before a big rain.
9. Erosion caused by tillage – waterway – no till – buffer strips
10. Chemical Runoff
11. Conservation – signing CRP

Conservation/Preservation

1. Sign up whole field or farm in CRP
2. Apply good conservation practices when ever possible
3. Educate people on these practices
4. If open space is needed can it be obtained by public domain?
5. In the long run can population control provide open space?
6. How much "open space" per person or per 1000/people does a person or city need?
7. Does open space improve quality of life?

Stewardship

1. Stewardship is lost when farms get divided up into small tracks
2. People do things that are not right and don't check before doing them.
3. How do you teach people stewardship? What is right/wrong?
4. Stewardship – Leave the land in better shape for the next generation.
5. The CSP program will "reward" stewardship of land – too cumbersome at present time if Ohio's 2 watersheds are indicators

6. Tax property break may be a partial reward for active stewardship. Question of speculation unanswered.

Meeting Notes
Land Use/Urbanization Meeting
Todd's Fork Watershed
July 23rd, 2004

Six over-arching issues were determined:

4. Urbanization – Land Use
5. Urbanization – Social Trends
6. Zoning/Planning
7. Impervious Surfaces
8. Loss of Local Control
9. Enterprise Zones

The participants determined the following underlying problems that help maintain or cause the issue:

Urbanization – Land Use

1. 5 acre lots – to small to farm – to large to mow – since 1993: 1500 small lots and 1500 5 acre lots – wasteful use of land prevents clustered development
2. Lack of zoning
3. Neg: the almighty $ pushes aside all other concerns!
4. Increase active recreation
5. + Urbanization – end of the frontier, - population explosion = to many people
6. View floodplains and wetlands as providing services
7. Loss of scenic beauty
8. Building on flood plains – 25 – 50 – 100 yr plains
9. More strict plans to control erosion
10. reduce car dependency
11. containing urban sprawl
12. Use of R.P.C. Comprehensive Plan 1995
13. Land being used for houses, when it should be used for open space
14. protect stream with buffer zones
15. County resident's perception of urbanization – education – apathy
16. Loss of Agricultural land
17. Prime Farm Land being developed
18. 5 acre + unregulated development
19. "High Dollar" wins
20. Over zealous application of current zoning discourages positive developers
21. Increase forested land and open space
22. Our action plan should encourage smaller lot sizes surrounded by more green space
23. Haphazard Development (sprawl)
24. Failure to be able to utilize Federal Prime Ag. Preservation Program – small amount of $ - 19 applications and 1 funded
25. Creating vital cities

26. Needs for Clinton County 1) conservation sub-divisions, 2) Large lot zoning a) German Township – Montgomery Co., b) Preble County reduces rapid development
27. (Need) Central Sewers
28. Too many driveways out letting to streets
29. We need to support conservation easements along streams

Urbanization – Social Trends

1. New is Better (Negative)
2. Society is very mobile – high turnover of jobs
3. Creates an unfavorable environment for farm business
4. The social trends depend on type of business in area
5. People involved in "converting" land don't want regulation
6. The creatures and plants don't get to show up at meetings
7. We perpetuate the problem as it is what we know Same Old, Same Old!
8. We're afraid to break out of our comfortable box!
9. Education – what is out there beyond our Box and what is working?
10. 2% population (are) farmers, 23% (population are) rural non-farmers, 75% (population are) city. Growing numbers want the life style of county living
11. Need to have a plan to educate people for rural life
12. Energy supply – fossil fuels – How long? Global warming. Alternate sources. Automobile use and power. Hydrogen Fuel? Disease control. Next epidemic. Chemicals
13. Foreign workers. Cultural differences. Low wages, etc. Straining public services, health care – child care, etc., Over-crowded housing.

Enterprise Zone

1. ???
2. Educate the general public on the Enterprise Zones
3. How will it effect the desires and needs of county residents?
4. Good: Brings in Industry. Bad: Can bring it in too fast
5. Reduces tax base funding services See: cost of community services studies
6. Don't understand enterprise zone
7. What is an enterprise zone? Free Enterprise? Most miss used combination of two words in our language
8. Shift commercial areas out of the city – Bellbrook – Beavercreek – Centerville
9. Review agencies bypassed – dense housing – more roads and road cuts – changing runoff and drainage – Regional Planning Commission – Rural Zoning Committee

Loss of Local Control

1. 719.01(b)(1) So-called Countrytyme Law (5 acre rule)
2. By-pass
3. State control over by-pass (State Official: "We are building it for one company")
4. Road building $
5. Again do we have a plan so we know the chosen direction

6. Bureau of land management LBL vs US Forest Service USFS US Department of Natural Resources USDNR
7. Enterprise Zones
8. Eminent Domain
9. Spreading sludge – manure on farm land
10. Business drives development instead of comprehensive plan
11. Review agencies cannot do proper planning – C.C. Regional Planning Commission – Rural Zoning Commission
12. Enterprise Zones (economic Development) – SR73 extension around Wilmington Mitchell Rd to David Drive – New housing & retail outlet, - 900 new DHL jobs = 600 part-time and 300 professional

Impervious Surfaces

1. Potential increase in pollution
2. Adds to global warming
3. Who regulates this or addresses runoff problems & needs
4. After the fact … who monitors? What if there is a problem who addresses this?
5. How much is there really? And compared to what?
6. EPA is already here. Do they have regs?
7. Creates non-point source pollution
8. Need to improve drainage regulations in Clinton Co.
9. Need to improve expertise in the review process for storm water run-off
10. Increase speed & volume of run-off
11. Create more grass & vegetation buffers to filter run-off & slow it down
12. Placement of impervious surfaces near creeks
13. Consider carefully impact of road building

Planning/Zoning

1. Spot Zoning
2. Zoning is ignored. Spot Zoning
3. Changing zoning without a plan – what will be rezoned land be used for – what is the cost in infrastructure
4. Unzoned townships
5. No zoning in Washington & Clark Twp (southern part of watershed)
6. 5 ac. Lots
7. Low density population growth centers
8. Define Zoning. Values
9. Planning & Zoning is not consistent through out the county
10. Adversarial enforcement of regulations, instead of cooperative atmosphere
11. Lack of entire tract devel.
12. Too easy to "escape" zoning %+ acres
13. How do we funnel our desires to the "powers that be"?
14. Who handles these issues n C.C.? Education: again
15. Do we have PLAN??
16. Don't feel there is much public input in the process of developing the comprehensive plan

17. Zoning is only as good as the will to enforce it
18. "Conservation" types of zoning (PUD) need to be implemented
19. Urgent need for Riparian Buffer zone overlays
20. Need to educate public on benefits of zoning and regulation
21. Political roadblocks to make changes?
22. Not current to address tomorrows problems
23. Our action plan needs to work for zoning that will enable more open space. Small lots around a green commons
24. We need to encourage bike paths and nature trails along streams
25. Our action should encourage zoning changes which will identify and encourage – 1. Riparian zone conservation, easements and open green space 2. Smaller lot sizes surrounding more green space 3. Bike trails/nature trails/public recreation
26. Ag enterprise zones

Meeting Notes
Runoff Meeting
Todd's Fork Watershed
July 25th, 2004

Four over-arching issues were determined:

10. Agricultural Runoff
11. Municipal Pollution
12. Residential and Building Site runoff
13. Industrial Pollution

The participants determined the following underlying problems that help maintain or cause the issue:

Agricultural Runoff

7. Soil Ersoion
8. Animal waste – storage and disposal
9. Chemical Storage
10. Who regulates and Monitis? Chemical use and runoff?
11. Who provides education for farmers chemical use?
12. Is no till encouraged and by whom?
13. Allow riparian areas
14. Cover crops
15. Allow hunting access
16. Animal waste management
17. Farm dumps
18. Sewage sludge spar
19. Direct deposit of human waste to waterways
20. Chemical Waste Disposal
21. Zoning or lack of
22. The Todd's Fork Watershed Plan Should encourage legislation that provides financial compensation and technical assistance to create stream buffer zones for riparian area
23. The Todd's Fork Action Plan should encourage the city of Wilmington and Blanchester to create infrastructure which can better retain storm water overflow
24. Problems: How to keep waste from being dumped near water checking to see where raw sewage is dumped directly into water ways
25. Data on: 1 pesticides 2 fertilizers 3 siltation seasonal factors 4 animal waste management
26. Sediment (erosion)
27. Nutrient Management (manure/fertilizers)
28. Chemicals (fuel & pesticides)
29. Litter (farm dumps, discarded equipment)
30. Chemicals applied above label rate
31. Uncontrolled erosion problems
32. WASCOB's currently not funded by NRCS

33. Our action plan should question present farming practices based on high chemical cost inputs & encourage a return to rotations that (use?) wheat grass and legumes

Municipal Pollution

1. Litter
2. Runoff from impervious surfaces
3. What is being dumped into storm drains??
4. Storm Sewers
5. Sanitary Sewer Systems –vs- Septic
6. Household waste
7. Litter
8. Contracting of waste collection and disposal both urban and rural
9. Proper disposal of HHW
10. No burn barrels
11. Air and light population
12. Lack of mass transit
13. wildlife management
14. yard waste/composting
15. Again problems with runoff from impervious areas
16. Litter along steams and rivers. Recycling does it help with this problem?
17. Keeping the sewer system up to speed with new development

Residential and Building Site Runoff

1. Our action plan should encourage enforcement of runoff legislation and consider additional measures necessary for more total reduction of soil runoff from building sites.
2. Litter
3. Lack of storm water retention area
4. Zoning or lack there of
5. Animal waste management – too many critters, too little land
6. Hunting access
7. Using licensed waste haulers – no more burn barrels
8. Pond building do we need permits or a plan to build?
9. Removal of top soil and returning to the site
10. Runoff of soil during any excavation
11. Chem runoff from lawn's being sprayed
12. Changing of water ways due to new building! Who monitors?
13. Chemical storage/disposal
14. Soil erosion/sediment from excavation
15. Contractor control of water while construction is going on. Some do good job while other don't.
16. Home owners make change to drainage after homes are built which cause other problems (erosion, stopped up ditches)
17. Construction: Sediment (erosion)
18. Construction: Litter
19. Residential: Chemical (fuel & pesticide)

20. Residential: Litter (pick up trash)
21. Residential: No retention/detention (basins) in old developments or 5 acre sites
22. Residential: Chem-Lawn
23. Residential: Fertilizers
24. Residential: Golf Courses?? & phosphorous – algae blooms in quiet pools
25. Building: erosion
26. Who will monitor the builders?
27. How will there materials be checked to see that no harmful chemicals will be used (such as lead paint or asbestos, etc.), and discarded so it can get into the water
28. How much of the watershed covered by sanitary sewer system?

Industrial Pollution

1. Training & education of employees on proper disposal of waste, trash and fluids
2. Industrial waste: What I can't see, but can only imagine
3. Parking lots (oil and anti-freeze)
4. PCB's, lead, heavy metals, cadmium, organics, silicon, mercury – depending upon industry
5. Chemical waste – how disposed of – carbon monoxide, etc.
6. Monitor fumes from smoke stacks – the chemical ashes, etc. fall on the ground, & into ground water
7. Air Pollution: 1. from planes 2. from trucks 3. from cars
8. Litter
9. Runoff from roofs and parking lot
10. Lack of natural peculation to aquifer
11. Control of heir bone picks = farm dumps
12. Chemical use & proper disposal
13. Attention to smaller businesses (and their disposal of chemicals)
14. Noise and light pollution
15. Who monitors? Who regulates chemical use?
16. As new ind. Bldg. or expansion takes place are chem.. to be used considered in zoning?
17. ? Is industry best put together in specific areas?? Are they adjacent to streams?
18. Are these our largest imperv. area run off problems?
19. Chemical Disposal Who Monitors the disposal?

Meeting Notes
Waste Water
Todd's Fork Watershed
July 24th, 2004

Three over-arching issues were determined:

14. Public Waste Water Treatment Plants
15. Failed Home Septic Systems
16. Mining - Limestone

The participants determined the following underlying problems that help maintain or cause the issue:

Public Waste Water Treatment Systems

1. Treatment system overloaded
2. Treatment systems allow for more houses
3. Good treatment of point sources
4. Poor treatment of non-point sources
5. Poor Sludge – from anywhere, semi-liquid
6. High Nitrogen, High Phosphorous, Low Potassium
7. Factory Sewage
8. Allows for Dense Population development (less land converted from agriculture)
9. Discharge into stream causes eutrophication and contamination (rocks in stream become slippery with diatoms)
10. Can input more nutrients than a small stream can accommodate
11. Encourage more growth in area (no sewer much less growth)
12. Don't need one if the "Clean Water" discharge is going to lower water quality in the creek
13. Proposed system for Martinsville and Midland will be lagoon and will be a mosquito problem
14. They stink
15. Concern about heavy rains overflowing lagoons and runoff in creeks.
16. Economic concern on people

Mining – Limestone

1. Altering water table by higher evaporation rates or pumping water directly (lowers water table)
2. Runoff from trucking, heavy machinery and hauling limestone
3. Runoff may "buffer" or make a stream more alkaline
4. Ruins quit rural setting of Clinton County
5. Removal of surface soil and refill
6. Methods – water blasting – explosions – trucking aggravates
7. Future land fills – future lakes
8. Limestone (dolomite) & (granite), glacial sand & gravel (gneiss)
9. Carbon cycle – Thermocline
10. Don't know enough about it

11. Don't know enough about this issue ??

Failing Home Septic Systems

1. Poor water drainage in Midland area, poor soil
2. Insufficient area for systems to work properly in Midland & Martinsville
3. Not as many faulty systems as county says
4. Septic system not properly maintained
5. No leach line system
6. Need financial assistance for home owners to up date old systems
7. Failing home septic systems
8. They need maintenance
9. Population density
10. Nonpoint Source?
11. Poor Soil Porosity (Illinios Glacier) – Blanchester, Midland, Westboro
12. Poor Septic Engineering – septic on hillsides, septic near streams, small lot size
13. Septic System Type – flow through system, reserve or alternate fields, not enough sand/gravel
14. Poor maintenance – people living in poverty, retired members, don't pump out 1 to 3 years, no digestive bacteria added
15. How do residents obtain "matching funds" for state septic improvement grants

Todd's Fork Watershed Action Plan
Public Issues

Problem	Volunteer Groups
1. Lack of Effective Zoning	1. Clinton RPC
2. Loss of Farmland, Open Space, and Forests	1. Greater Clinton Co. Land Trust 2. Little Miami, Inc. 3. Lytle Creek League of Conservators
3. Not Enough Riparian Zone Protection	1. LMI 2. Greater Clinton Co. Land trust 3. NRCS 4. Lytle Creek League of Conservators
4. Not Enough Recreational Use, Bike and Nature Trails	1. Lytle Creek League of Conservators
5. No Use of the Federal Prime Agriculture Preservation Program	1. NRCS
6. Impervious Surfaces	1. Streamkeepers - Education
7. Over Applied Chemicals in Residential Areas	1. Streamkeepers
8. Agriculture related Issues: Erosion, Chemical Applications, Waste Storage and Disposal, Sludge Spreading, Dumps, Burn Barrels, Nutrient Management and Funding for Best Management Practices	1. NRCS
9. Litter	1. Lytle Creek League of Conservators 2. ODNR
10. Noise Pollution	1. Green Space Preservation
11. Education: Conservation Practices (Added: Not just conservation but general education - water quality - importance of riparian corridors for mitigating development - importance of preserving habitat)	1. Streamkeepers 2. LMRP