

Profile 1 - Natural Resources

Introduction

The inventory and identification of Mercer County's natural resources is an important part of the planning process, as these elements combine to form the "Green Infrastructure" of the County. Delineation of these resources helps to determine where development should be directed and those areas that need to be protected.

Land-Based Resources

Topography/Steep Slopes

- **Mercer County falls within the Appalachian Plateaus Physiographic Province, specifically the Northwestern Glaciated Plateau section.** The dominant topographic form within this section is characterized by "broad, rounded upland and deep, steep-sided, linear valleys that are partly filled with glacial deposits"¹. The underlying rock is shale, siltstone, and sandstone.
- **The Environmentally Sensitive Features – Land Based Map illustrates the location of very steep slopes (grades over 25%) within the County.** Virtually all are found along the river and stream corridors, including the Big Bend area of the Shenango River, along the Neshannock Creek in Lackawannock Township, along Sandy Creek and at the south end of Lake Wilhelm.
- **The significance of these areas to planning is two-fold.** First, if disturbed, they can produce heavy soil erosion and sediment loading in adjacent streams. While this does not necessarily preclude development, additional requirements for addressing storm water runoff need to be in place in order to minimize erosion and the subsequent degradation of surface waters.

In addition to erosion concerns, traditional on-lot septic systems are generally impractical on steep slopes as the downhill flow of the effluent may be too rapid for proper filtration. Improperly treated effluent is likely to surface at the base of the slope, causing wet, contaminated seepage spots. If there is a layer of impervious material such as dense clay or rock under shallow soils, the effluent may surface on the slope and run downhill unfiltered.

Geology & Groundwater

- **In addition to creating the visual landscape, subsurface geology ultimately controls the quality and quantity of groundwater.** Limits in groundwater availability and quality may dictate what type of development can occur in any given area. *The Geology Map* illustrates the County's subsurface geologic formations and Table 1-1 provides a descriptive summary of some of each formation's engineering characteristics. These

¹ PA Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey, 2000.

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characteristics determine what kinds of structures can be built in an area and the degree of difficulty of the potential construction project.

Table1-1-1 Engineering Characteristics of Geologic Formations

Formation	Description	Porosity	Permeability	Ease of Excavation	Foundation Stability	Median Groundwater Yield (GPM)
Allegheny Formation (Group)	A highly heterogenous unit composed of cyclic sequences of sandstone, shale, siltstone, claystone, and underclay	Sandstone-moderate; others low	Moderate to low	Difficult to moderately easy	Good	50
Berea Sandstone through Venenago Formation, undivided	Wide variation of characteristics	Moderate to low	Moderate to low	Moderately difficult to easy	Good	<10
Corry Sandstone through Riceville Formation, undivided	Wide variation of characteristics	Moderate	Moderate to low	Difficult to moderately easy	Good	15
Cuyahoga Group	Medium gray siltstone and dark-gray shale containing interbedded light-gray sandstone; marine fossils are common	Low	Low	Moderately easy in shale; difficult in sandstones	Good	Sharpsville sandstones - 50; others are poor aquifers
Pottsville Formation (Group)	Light- to dark-gray, fine-grained to coarsely conglomeratic sandstone; subordinate amounts of gray shale, siltstone, limestone, coal, and underclay	Variable	Moderate to low	Difficult to moderately easy	Good	50
Shenango Formation	Upper part is soft, medium- to dark-gray shale, medium-light-gray siltstone, and limy siltstone; lower is fine-grained sandstone, light-gray to yellowish-gray, fossiliferous, cross-bedded, containing some interbedded dark- to medium-gray shale and siltstone	Moderate to low	Moderate to low	Shale - moderately easy; Sandstone - Difficult	Good	<5

Sources: Pennsylvania State University, Earth Resources Research Institute, 1994.

Alan R. Geyer and J. Peter Wilshusen, Engineering Characteristics of the Rocks of Pennsylvania. 1992. (Pennsylvania Geological Survey, Harrisburg, PA).

The first two characteristics – porosity and permeability - refer to the ability of liquids and gases to pass through the rock. This impacts two development factors: availability of water, and septic absorption. A “low” rating means that the rock is essentially impenetrable, while a “high” rating would generally indicate a rapid flow of water. Ease of excavation indicates the type of equipment that would generally be needed to construct a building or road foundation, and ranges from easy to difficult. “Easy” means that hand tools or lightweight power equipment would be able to do the job; “difficult” would usually require drilling and blasting unless the rock is already fractured or weathered. Foundation stability ratings indicate the bearing capacity of the rock formations, which ultimately determines the type of structure that can be built in an area. Finally, Groundwater Yield refers to the average number of gallons of water per minute that can be expected from a well dug in the area. (Source: Engineering Characteristics of the Rocks of Pennsylvania, Dept. of Environmental Resources, 1982).

As shown on the map, almost one half of the County is underlain by the Pottsville Formation or group of rocks, which indicates that on-site wells in these locations should produce good yields. The Shenango Formation is the second most prevalent

followed by the Cuyahoga Group. As shown, these two groups are closely associated and are generally found in the northwestern part of the County. Together, they cover an additional 35 percent of the County. Neither group, except for those areas found in the Sharpsville Sandstones, will produce wells with relatively poor yields, thus introducing some limitations to new development.

Groundwater Quality and Supply

- **Groundwater quality and supply is ultimately controlled by the underlying bedrock geology.** Numerous factors affect groundwater movement and availability. Yields depend heavily on specific rocks within the group or formation. In Mercer County, they range from less than 5 gallons per minute (gpm) in the shales of the Shenango Formation to optimum yields of 100 to 300 gpm in the sandstone and limestone aquifers of the Pottsville and Cuyahoga Groups.
- **Groundwater quality is dependent on the interaction between the groundwater and the bedrock.** The more soluble types of bedrock, such as limestone, allow more compounds to be dissolved in the groundwater, thus resulting in increased hardness values. In Mercer County, the Berea and Cuyahoga Groups tend to have hard water. In addition, excessive amounts of iron are often found in the groundwater of each of the geologic formations, particularly at shallower depths. Within the Allegheny, Berea, Cuyahoga, and Pottsville Groups, water within the aquifers that are 100 feet below the major drainage level may also contain brackish or salt water.

Soils

- Soil Surveys combine soils into soil associations, or groups that emphasize how soil depth, slope, and drainage affect potential land use and cover. The associations are helpful in attaining a general idea of soil quality in different sections of the study area, as well as locating large areas that may be suitable for certain specific uses.
- Table 1-2 below lists the four soil associations found within the planning area, along with a brief description of each and their approximate locations. Specific soils within each association are also grouped according to their Capability Class, that is, their ability to produce crops. This grouping is based on the physical and chemical properties of the soil and ranges from Class 1 through Class 8.

Table 1-1-2 - Soil Associations in Mercer County

Soil Association	Description	General Location
Ravenna-Frenchtown	Somewhat poorly drained to poorly drained, nearly level to gently sloping soils formed in glacial till, on uplands	In the least sloping parts of the uplands; most extensive association in the County
Chanango-Braceville- Halsey	Well drained to very poorly drained, gently sloping to moderately steep soils underlain by sandy and gravelly deposits, on stream terraces and moraines	Occurs as bands on terraces along most major streams in the county and on the moraines in the eastern and southeastern parts of the County.

Soil Association	Description	General Location
Canfield-Ravenna	Moderately well drained and somewhat poorly drained, gently sloping to moderately steep soils underlain by glacial till, on uplands	Dominant on the more strongly sloping parts of the uplands, near major streams. Less extensive areas on high knobs throughout the county and on the moraines in the east and southeast
Wayland, coarse variant-Papakating-Red Hook	Very poorly drained to moderately well drained, nearly level soils underlain by alluvium, on flood plains.	Occurs as bands on the flood plains of most of the streams in the county.

Source: Soil Survey – Mercer County - 1971

Prime Agricultural Soils

- **Prime farmland, as defined by the U.S. Department of Agriculture (USDA), includes Class I and II soils and is the land that is best suited to producing food, feed, forage, and fiber and oilseed crops.** Prime agricultural soils have the quality, growing season, and water supply needed to economically produce a sustained high yield of crops with minimal additional inputs. As illustrated on the *Land Resources Map*, these soils are found throughout the County. GIS data indicates that there are over 225,000 acres of Prime Farmland Soils in Mercer County – approximately 51 percent of the entire County. Of these, one quarter -almost 58,000 acres - are currently covered by forests.
- **Farmland Soils of Statewide Importance are soils that are predominantly used for agricultural purposes within a given state, but have some limitations that reduce their productivity or increase the amount of energy and economic resources necessary to obtain productivity levels similar to prime farmland soils.** These soils are usually classified as Capability Class II or III. These soils are also found throughout the County as shown on the map, and cover approximately an additional 145,000 acres, or about one third of the total land area. Of these, over 37,000 acres are covered by woods, or approximately 26 percent.
- **Combined, Prime Agricultural and Soils of Statewide Importance cover approximately 85 percent of Mercer County.**

Agricultural Preservation in Mercer County

- Mercer County works hard to maintain its agricultural heritage. The Mercer County Agricultural Development Council was formed in 1983 for just that purpose. Council members are appointed by the County Commissioners and meet monthly. “The council strives to promote agriculture in a positive and visible method to show and inform the citizens of how important agriculture is to the county. Some of the programs the Ag Development Council efforts include promoting Mercer County Country Tour, promoting "Ag in the Classroom," updating Mercer County Agricultural Resource Book, and enhancing economic development of Mercer County agricultural industry.”²

² Mercer County Web Site; www.mcc.co.mercer.pa.us.

- **2003 updates to the 2002 Census of Agriculture statistics indicate there are 1,240 farms in the County. There are approximately 163,000 acres in farms, with an average farm size of 132 acres.** Dairy products, nursery and greenhouse crops, cattle and calves, corn for grain, and hay, silage field seeds and grass seeds are the top commodities. According to the Census update, the market value of the agricultural products sold was over \$64,434,000.³
- The purchase of conservation easements has been one of the tools that the County has used to help protect its most productive agricultural lands. This program involves the outright purchase of the development rights of specific properties. The property must meet specific criteria, including the presence of productive soils, in order to be eligible for consideration. Limited funds have been the primary constraint to the expansion of these efforts. According to the Pennsylvania Farmland Preservation Board, Mercer County has purchased conservation easements for 32 farms totaling 5,684 acres as of December 2005.

According to the Pennsylvania Department of Agriculture, Mercer County ranks 17th in total number of acres preserved (5,684 acres) and 20th in the number of farms preserved (32), when compared to the other 52 counties throughout the state that have purchased easements. However, the County is paying the 7th lowest average price per acre (\$767); significantly lower than the statewide average of \$2,175 per acre.

Table 1-3 - Conservation Easements in Mercer County, 1992 - 2005

TOWNSHIP	ACRES	YEAR
WILMINGTON	88.04	2/94
JEFFERSON	102.11	5/92
WILMINGTON	100.00	8/93
JEFFERSON	86.22	8/93
WILMINGTON	145.45	4/93
WILMINGTON	79.58	4/93
WILMINGTON	120.00	10/92
JEFFERSON	143.64	3/94
DELAWARE	110.76	4/94
JEFFERSON	108.08	5/95
COOLSPRING	198.85	6/95
EAST LACKAWANNOCK	139.00	9/95
COOLSPRING / FAIRVIEW	341.56	4/97
WORTH	501.6	3/97
JEFFERSON	117.16	7/97
FAIRVIEW	224.64	12/97
OTTER CREEK / HEMPFIELD	203.61	5/98
NEW VERNON	111.85	12/98
FAIRVIEW	97.12	2/99
NEW VERNON	134.6	7/99
MILL CREEK	191.87	4/00
PERRY / FAIRVIEW	195.6	7/00

³ *Pennsylvania Agricultural Statistics 2003-2004*, USDA National Agricultural Statistics Service

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TOWNSHIP	ACRES	YEAR
NEW VERNON	164.8	12/00
LACKAWANNOCK	158.03	5/00
MILL CREEK	425	2/01
NEW VERNON	152.4	8/01
COOLSPRING	321.02	5/02
FAIRVIEW	184	11/03
NEW VERNON	161.37	3/04
HEMPFIELD	135	3/05
FAIRVIEW	156.78	4/05
DELAWARE	240	4/05
TOTAL	5,639.74	
Current data as of February, 2006. Source: Mercer County Ag Land Preservation Program		

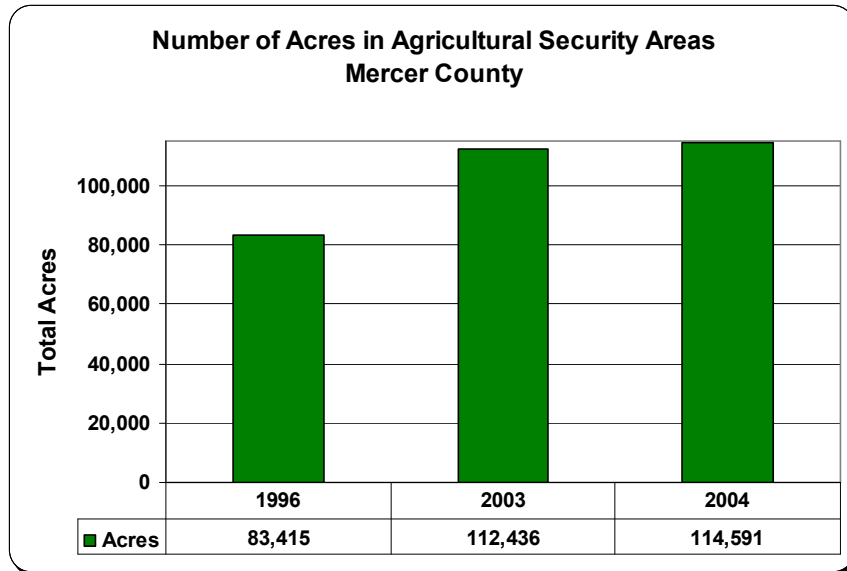
- **The Agricultural Security Area (ASA) program began in 1981 as a tool for strengthening and protecting agriculture in Pennsylvania.** Farm landowners, working together, initiate the process of establishing such areas in which agriculture is the primary activity. Participating farmers are entitled to special consideration from local and state government agencies, and other "nuisance" challenges, thus encouraging the continuing use of the land for productive agricultural purposes.

Key Features of the Agricultural Security Area Program:

- Initiated by petition of farm landowners
- Minimum area of 250 total acres (within municipality)
- May include non-adjacent farmland parcels over 10 acres
- Township or borough level program
- Seven year lifetime, then reviewed by municipality
- Parcels may be added during seven year period
- Participation by landowners is voluntary
- Use of land is not restricted (not a land use law)
- Participants receive special consideration regarding local and state ordinances and legal challenges affecting farming.
- Participants eligible to sell agricultural conservation easements⁴

⁴ Mercer County Cooperative Extension Service Website; <http://mercercountyextension.psu.edu/Agriculture>

Figure 1-1 - Acres in Agricultural Security Areas



- Penn State Cooperative Extension Service records indicate that 28 of the County’s municipalities have established Agricultural Security Areas (ASA).** Combined, there are 1,277 properties that cover over 114,000 acres in Mercer County. This represents approximately 26 percent of the entire County. Delaware Township has the greatest number of properties (130) and total acreage (8,447) and Perry Township is second with 93 properties encompassing over 6,800 acres. Table 1-4 summarizes the information regarding ASAs in the County and, in addition to the number of properties and acreage, includes the date they were established and their next renewal deadline. Chapter Two of the Greenways, Open Space, and Rural Recreation Plan contains a map that illustrates the percentage of land in an ASA for each municipality. Additional information, including the specifics for creating an ASA can be found on the web at <http://mercerc.extension.psu.edu/Agriculture>

Table 1-4 - Agricultural Security Areas in Mercer County

Township	Number of properties included in ASA	Number of acres included in ASA	Date ASA was Established	Renewal Deadline
1 Coolspring	61	5,741.5	March 2, 1992	2006
2 Delaware	130	8,447.0	October 2, 1991	2005
3 East Lackawannock	44	5,387.0	June 12, 1990	2004
4 Fairview	49	5,264.5	March 9, 1994	2008
5 Findley	74	4,316.5	Nov. 8, 2001	2008
6 French Creek	27	2,463.6	Sept. 10, 2001	2008
7 Hempfield	22	1,350.0	June 14, 1994	2008
8 Jackson	46	4,751.0	June 1, 1994	2008
9 Jefferson	36	4,034.0	April 28, 1990	2004
10 Lackawannock	43	3,792.0	July 15 1993	2007
11 Lake	46	5,083.8	May 10, 1993	2000
12 Liberty	30	2,944.0	Aug. 13, 1998	2005
13 Mill Creek	31	4,562.7	June 7, 1993	2007
14 New Vernon	46	4,723.9	July 8, 1993	2007
15 Otter Creek	43	3,366.0	Sept. 14, 1994	2008
16 Perry	93	6,836.8	April 6, 1994	2008
17 Pine	17	1,837.0	April 2, 2001	2008
18 Salem	10	1,804.0	Aug. 6, 2001	2008
19 Sandy Creek	28	2,242.0	Sept. 5, 1995	2009
20 Sandy Lake	32	2,753.7	April 10, 1995	2009
21 Shenango	62	3,938.9	June 11, 2001	2008
22 South Pymatuning	68	4,723.6	Feb. 9, 1998	2005
23 Springfield	37	3,086.0	Sept. 1, 1993	2007
24 Sugar Grove	44	2,828.0	Sept. 3, 1996	2010
25 West Salem	47	4,926.7	Feb. 14, 1995	2009
26 Wilmington	56	5,979.8	April 10, 1990	2004
27 Wolf Creek	25	3,738.0	Aug. 8, 1991	2005
28 Worth	30	3,669.0	July 6, 1993	2007
Total Properties and Acreage	1277	114,591.0		

Source: Penn State Cooperative Extension Service

Hydric Soils

- Hydric soils are those that retain water during a portion of the year and are usually associated with wetlands.** As a natural resource, hydric soils provide water storage and filtration that naturally regulates water sources and flows. These soils are susceptible to compaction and uneven settling when developed. These factors will ultimately impact land use decisions. Just over 42 percent of the County's land area, or 186,000 acres, are classified as hydric soils. They are shown on the *Water Resources Map*.

On-lot Septic Suitability

- **Soil type also affects septic tank absorption.** Soils are rated according to their absorption capabilities, and range from slight, i.e., few limitations to absorption, to severe, i.e., limitations so difficult to overcome that special designs and additional costs are necessary to safely handle septic waste. Each of the major soil groups found within the County is classified as severe due to high water tables, flooding, and/or slow permeability. This means without the proper systems, the chances of groundwater contamination are much greater. Site-specific analysis for new development is essential to ensure that the proper systems are put in place.

Water-Based Resources

Surface Waters

- **Surface waters include rivers, streams and ponds.** They provide aquatic habitat, carry or hold runoff from storms, and provide recreation and scenic opportunities. Surface water resources are a dynamic and important component of the natural environment, but ever-present threats such as pollution, construction, clear-cutting, mining, and overuse have required the protection of these valuable resources.

Mercer County has an abundance of surface waters, which are shown on the Water Resources Map. The Shenango River runs north/south in the western part of the County and is the major river in the County. In 1965, the Army Corps of Engineers completed The Shenango River Lake project, which provides flood protection for the Shenango River Valley, as well as for the Beaver and upper Ohio Rivers. The project also provides seasonal discharge regulation for water quality improvement and recreation opportunities. Table 4 below lists the major water ways in the County. Other significant lakes include Lake Wilhelm, which is north of Sandy Lake Borough; Sandy Lake, which is in Stoneboro; and Lake Latonka, which is located along the border of Coolspring Township and Jackson Township.

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Table 1-1-5 - Waterways in Mercer County

Waterway	Tributary of...	Location
Crooked Creek	Little Shenango River	Sugar Grove Twp
Little Shenango River	Shenango River	Lake Twp, New Vernon Twp, Perry Twp, Salem Twp, Sugar Grove Twp, Hempfield Twp, Greenville Borough
Big Run	Shenango River	Greene Twp, West Salem Twp
Otter Creek	Neshannock Creek	Otter Creek Twp, Delaware Twp, Fairview Twp, Coolspring Twp, Findley Twp, Mercer Borough
Cool Spring Creek	Neshannock Creek	Jackson Twp, Coolspring Twp, Findley Twp, Mercer Borough, Fairview Twp
French Creek	Allegheny River	French Creek Twp
Little Neshannock Creek	Neshannock Creek	Jefferson Twp, border between Lackawannock and East Lackawannock Twp
Little Neshannock Creek (West Branch)	Neshannock Creek	Hermitage, Lackawannock Twp, Wilmington Twp
Neshannock Creek	Shenango River	Mercer Borough, border of East Lackawannock and Findley Twp, Springfield Twp
Wolf Creek	Slippery Rock Creek	Worth Twp, Wolf Creek Twp, Pine Twp, Grove City Borough, Liberty Twp
Sandy Creek	Allegheny River	Sandy Creek Twp, Deer Creek Twp, New Vernon Twp, Mill Creek Twp, Sandy Lake Twp and Borough

Water Quality/Impaired Streams

- **The Pennsylvania Chapter 93 Water Quality Standards classify all surface waters according to their water quality and protected water uses.** Selected water bodies that exhibit exceptional water quality and other environmental features are referred to as “Special Protection Waters.” Certain activities in those watersheds that could adversely affect surface water are more stringently regulated in order to prevent degradation. Only the Little Sandy Creek in Mill Creek Township qualifies as a Special Protection Water and is currently considered a High Quality waterway.

Use classifications within the County are Warm Water Fish (WWF), Cold Water Fish (CWF), and Trout Stock Fish (TSF). Most fall into the Warm Water Fish category; however, the Neshannock Creek and its tributaries and the basin of the Little Shenango River are in the TSF category. Wolf Creek and a small section of the Shenango River below the dam are in the CWF category.

- **When surface waters fail to meet the water quality standards for its designated use or special protection classification, they are considered impaired.** Of the County’s 1,135 miles of streams, only 67 miles or about 6 percent are impaired. They are illustrated on the Water Resources Map and include the following stream reaches.

Impaired Stream Reaches in Mercer County

- The Shenango River from the Dam south into Lawrence County and also from Jamestown south to a point about mid-way through Greene Township.

- Bobby Run, a tributary of the Shenango in Hermitage, south to its confluence with the main stem.
- Crooked Creek from the Crawford/Mercer County line to its confluence with the Little Shenango River.
- A small portion of Sandy Creek from the dam on Lake Wilhelm south to Sandy Lake Borough.
- A section of the East Branch of Wolf Creek north of I-80 near Venango County Line.
- Wolf Creek from the northern boundary of Grove City south to its confluence with Barmore Run
- A small section of Barmore Run near Barmore Lake in Liberty Township.
- A small section of Mill Creek (a tributary of Cool Spring Creek) that crosses under I-79 in Findley Township.
- Yellow Creek (another tributary of Cool Spring Creek) from Jackson Center south to its confluence with Cool Spring near the Jackson Township line.

Additional information regarding water quality and impaired streams can be found online at www.emappa.dep.state.pa.us.

Floodplains

- **Floodplain areas absorb and store large amounts of water, which is a source of aquifer recharge.** Natural vegetation supported by floodplains helps trap sediment from upland surface runoff, stabilize stream banks, and reduce soil erosion. Floodplains also provide shelter for wildlife and proper stream conditions for aquatic life.

Regulation of floodplains helps to reduce the threat to human life and property caused by periodic flooding. For regulatory purposes, a floodplain is defined by the 100-year, or base flood, which has a one percent chance of being equaled or exceeded in a given year. The **Water Resources Map** shows the County's stream network and floodplains. At the present time, there are just over 1,900 acres of developed land⁵ within the 100-year floodplains of Mercer County. This represents approximately 7 percent of the total floodplain acreage.

The Pennsylvania Floodplain Management Act (Act 166 of 1978) requires municipalities identified as being flood-prone, to enact floodplain regulations which, at a minimum, meet the requirements of the National Flood Insurance Program (NFIP). The NFIP is a federal program that allows property owners in participating communities to purchase insurance protection against losses from flooding.

Wetlands

- **Wetlands are unique environments that perform a variety of important functions.** They moderate storm water runoff and downstream flood crests because they are natural water storage areas. Wetlands help to maintain stream flow and groundwater recharge, as

⁵ Developed land included residential, commercial, and industrial uses.

well as provide important habitats for many species of plant and animal life. As shown on the **Water-Resources Map**, wetlands are located along several of the County's primary waterways, including the Shenango and Little Shenango Rivers, the Little Neshannock Creek, Sandy Creek, and Wolf Creek. They are also found in pockets throughout Mercer County, particularly in the drainage basins of Wolf Creek and the Little Neshannock Creek. The Federal Clean Water Act and similar state and local laws have led to the enforcement of wetland protection, which is the responsibility of both the U.S. Army Corps of Engineers and the Pennsylvania Department of Environmental Protection.

There are a number of problems associated with developing on wetland soils. First, wetlands are often located in floodplains. Second, draining or filling in of wetlands removes natural water storage, which can create storm water runoff problems downstream. Finally, wetland soils are easily compacted, which can result in uneven settling of structures, and those soils with low permeability and high groundwater tables are unsuitable for the installation of on-lot septic systems.

Vegetation and Wildlife

- **The Natural Heritage Inventory for Mercer County⁶ provides a preliminary report of the County's natural heritage.** Completed by the Western Pennsylvania Conservancy in June 2003, the inventory identifies and maps the most significant natural places in Mercer County. Plant and animal species, natural communities that are unique or uncommon in the County and areas important for wildlife habitat and scientific study were investigated and included in the inventory process. While the inventory does not protect these areas, it provides the necessary information to guide land acquisition and conservation decisions. It can also be used in the development of municipal comprehensive plans and zoning ordinances, as well as in the review of development plans. Table X summarizes the results of the inventory, listing the Natural Heritage Areas "in order of their significance to the protection of the biological diversity and ecological integrity of the region".⁷ The entire report can be accessed online via the Mercer County Regional Planning Commission's website – www.mcrpc.com
- **Natural Heritage Areas are classified as a Biological Diversity Area (BDA), a Landscape Conservation Area (LCA), or Managed Lands.** A BDA contains plants or animals of special concern at state or federal levels, exemplary natural communities, or exceptional native diversity. An LCA is a large contiguous area that is important because of its size, open space, habitats, and/or inclusion of one or more BDAs. Managed Lands are owned or leased properties with importance or potential importance to the overall maintenance and protection of ecological resources in the County and fall into three categories: Public, Private, and Dedicated Areas⁸. The areas have also been ranked according to significance – exceptional, high, and notable. This ranking process assures that the most important sites and resources receive priority consideration for preservation.

⁶ *Mercer County Natural Heritage Inventory*. Western Pennsylvania Conservancy, June 2003

⁷ Ibid.

⁸ Ibid.

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Table 1-1-6 - Natural Heritage Inventory Sites

Site	Municipality	Description
EXCEPTIONAL SIGNIFICANCE		
Barmore Lake BDA	Pine Township	Isolated wetland that is the location of a PA plant species and an animal species of special concern.
French Creek BDA	French Creek Township	Riverine community supporting many animal species of special concern
French Creek LCA	French Creek Township	Watershed that contains numerous animal species of special concern and several natural communities.
Pine Swamp BDA	Worth Township	Headwater wetland complex that provides habitat for an exceptional natural community and several plant species of special concern.
Sandy Creek BDA	Sandy Lake Township	Wetlands along Sandy Creek and tributaries that are the location of a Pennsylvania animal species of special concern.
Sandy Creek LCA	Sandy Creek Township	Watershed that contains numerous important natural communities, and plants and animals of special concern.
Sandy Lake BDA	Stoneboro Borough	Glacial lake that is the location of numerous plant species of special concern and a natural community of special concern.
Shenango Lake BDA	Clark Borough	Impounded lake of the Shenango River that provides habitat for four animals of special concern and one plant species of special concern.
Shenango River BDA	Delaware Township	Aquatic habitat important to several animal species of special concern.
Shenango River LCA	Delaware Township	Watershed that supports numerous animal and plant species of special concern.
HIGH SIGNIFICANCE		
Cranberry Swamp BDA	Deer Creek Township	Wetland complex at the headwaters of Black Run that is the location of two important the location of two important natural communities.

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Site	Municipality	Description
Crooked Creek BDA	Sugar Grove Township	Stream community and floodplain pools that supply habitat for two animals of special concern, a natural community and a plant species of special concern.
Lake Wilhelm BDA	New Vernon Township	Lakeshore that serves as habitat for two animal species of special concern.
Mercer Bog BDA	East Lackawannock Township	Bog with a floating "peat island" that is the location of a Pennsylvania plant species of special concern.
Millbrook Swamp BDA	Worth Township	Wetland that is the location of a Pennsylvania animal species of special concern.
Sandy Creek Headwaters BDA	Sandy Creek Township	Fen and forested wetland that supports two natural communities and two plant species of special concern.
Schollard Run BDA	Springfield Township	Open fields and wetlands that provide habitat for several plant and animal species of special concern. Also location of a ravine with a hemlock-northern hardwoods community.
Sharpsville BDA	Sharpsville Borough	Riverine habitat within the Shenango River that supports an animal species of special concern.
Urey Swamp BDA	Mill Creek Township	Headwater swamp of Mill Creek that contains a special natural community.
NOTABLE SIGNIFICANCE		
Wolf Creek LCA	Liberty Township	LCA that is the location of high quality aquatic community.
Wolf Creek Wetlands BDA	Worth Township	Wetland along Wolf Creek that provides habitat for a Pennsylvania animal species of special concern.
Amsterdam BDA	Liberty Township	Roadside habitat and mature forested area that provides habitat for a plant and animal species of special concern.
Salem BDA	Sugar Grove Township	Mature forest that provides breeding habitat for an animal species of special concern.
Kashner Corners Swamp BDA	Otter Creek Township	Wetland in the headwaters of Otter Creek that holds a Wet Meadow and a Bottomland Oak-Hardwood Palustrine Forest.
Leesburg Station BDA	Springfield Township	Stream habitat along Neshannock Creek that provides habitat for an animal species of special concern.
Little Neshannock Creek BDA	Wilmington Township	Stream community and riparian area that provides habitat for an animal species of special concern.

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Site	Municipality	Description
Swamproot BDA	Pine Township	Wetland that is the location of a natural community and a plant species of special concern.
COUNTY SIGNIFICANCE		
Swamp Run Tributary BDA	Pine Township	Small, isolated wetland that is the location of a Pennsylvania plant species of special concern
Wolf Creek Swamp Bda	Pine Township	Forested swamp in the floodplain of Wolf Creek recognized as a special natural community
Deer Creek BDA	French Creek Township	South-facing slope that is the location of a county significant natural community.
Shenango River Oxbow BDA	Shenango Township	Wetland in the floodplain of the Shenango River that has a county significant natural community.

Source: Mercer County Natural Heritage Inventory, Western PA Conservancy, 2003.

Environmental Indicators

Land Preservation and Conservation

- There are a number of ways to preserve open spaces, farms, and woodlands in Mercer County. There are almost 9,000 acres of open space and woodland preserved as either Pennsylvania State Game Lands or State Parks. According to the Pennsylvania Farmland Preservation Board, Mercer County has purchased conservation easements for 32 farms totaling 5,684 acres as of December 2005.

According to the Pennsylvania Department of Agriculture, Mercer County ranks 17th in total number of acres preserved (5,684 acres) and 20th in the number of farms preserved (32), when compared to the other 52 counties throughout the state that have purchased easements. However, the County is paying the 7th lowest average price per acre (\$767); significantly lower than the statewide average of \$2,175 per acre.

- There are an additional 114,000 acres currently enrolled in Agricultural Security Areas.

Environmental Regulations

- Zoning and Subdivision/Land Development Ordinances can be useful tools for protecting the natural environment by including special provisions for sensitive areas such as floodplains and steep slopes. Thirty of the county's 48 municipalities have zoning ordinances and twelve municipalities have Subdivision and Land Development Ordinances. A detailed list of the municipalities and their ordinances can be found in Chapter 6.

Development in the Floodplains

- GIS data indicate there are approximately 1,900 acres of developed land that fall within the 100 year floodplains of Mercer County's waterways. This represents approximately

7 percent of the total floodplain acreage within the County and only 0.4 percent of the entire County. Developed land categories are based on information generated by Penn State University (PSU), and include the categories of High and Low Density Urban, as well as Transitional.

Woodland Areas

- Mercer County has an abundance of wooded area throughout the County. PSU data indicates there are a total of 162,000 acres of woodlands – approximately 37 percent of the County’s total land area. Deciduous Forest is the primary type, covering almost 155,000 acres. Coniferous and Mixed Forests make up the balance.

Impaired Streams

- A stream is considered impaired by the Pennsylvania Department of Environmental Protection if it does not support its designated use as determined by Chapter 93, Title 23 of the Pennsylvania Code. At the present time, DEP has assessed most of the water ways in Mercer County and have determined that approximately 67 miles of assessed streams are impaired. This is approximately 6 percent of the County’s total waterways.

Impervious Surfaces

- Changes in land use will alter the amount of impervious surfaces within an area, which can impact stream quality due to increased storm water runoff. In order to measure the potential change in the amount of impervious surfaces within the county’s watersheds, values for percent impervious were assigned to each of the existing and future land use categories in the county. These values were based on data provided by PA DEP in the Erosion and Sediment Pollution Control Program Manual.
- GIS software analysis indicates that the most significant change in the amount of impervious surfaces would occur in the Shenango River watershed. Approximately 11,000 acres would shift from less than 30% impervious to between 30-44% impervious and an additional 4,000 acres would shift to 70-85% impervious. This would represent approximately 10% of the entire watershed, compared to less than two percent at the present time. However, these are projected changes that can be influenced by implementing best management practices that can limit the total amount of impervious surface associated with new development, including subdivision design that includes small building lots and public open spaces.