Chapter 2 - Background

Location and Setting 9
Physical Geography 9
The People 9
Population 10
Environmental and Natural Features 21
Land Cover 36
Environmental Problems within Berks County 41

Background

A. Location and Setting

Berks County is an urban area of 411,442 persons (2010 Census), situated in southeastern Pennsylvania. The County is a diamond–shaped area of 864 square miles (Figure 2.1). The County seat, which is the City of Reading, is 56 miles northwest of Philadelphia. Berks County is bordered by Schuylkill County to the north, to the west by Lebanon and Lancaster Counties, to the east by Lehigh County, and to the south by Chester and Montgomery Counties. Despite its closeness to the Philadelphia Metropolitan Area, it is considered part of Pennsylvania's Dutch Country (Berks County Pennsylvania, Economic Resource Profile). Through numerous Federal and State highways and turnpikes, the County is linked to other major cities such as New York (125 miles) and Baltimore (97 miles). Sections of the Blue and South Mountains, which are ridges of the Appalachian Mountain chain, form its northern and southern boundaries with elevations averaging about 640 feet above sea level. The mean annual temperature is 54.3 degrees Fahrenheit. The average rainfall is 41.4 inches and the average annual snowfall is 30.6 inches.

B. Physical Geography

Berks County is rich in historical, scenic and natural resources. These assets are a result of the diverse physiographic regions that are present in the area, as visible on the Physiographic Provinces Map (Figure 2.2).

Originally a barrier to migration during the pioneer settlement of the State, the Blue Mountain forms the northern boundary of the County. This barrier is pierced at Schuylkill Gap above Hamburg and is crossed by four other roads. The South Mountain ridge reaches elevations between 800 and 1200 feet above sea level. It enters the County from the west, south of U.S. 422, and extends in two directions through Berks County. The primary ridge encircles Reading and then extends northeast into Lehigh County, forming the Reading Prong. The secondary ridge extends southeast along the south side of the Schuylkill River. Extending the entire width of the County, between the Blue and South Mountains, is the Great Valley Region. The limestone section is predominantly rolling farmland, containing rich agricultural soil with elevations of 200 – 500 feet above sea level. The shale section of the Great Valley, occupying higher elevations between 400 – 800 feet above sea level, is located next to the Blue Mountain. The Piedmont Lowlands are located in the southernmost part of the County and are comprised of lower mountains and rolling hills. It is, however, crossed by the Schuylkill River as it flows toward the Delaware River.

C. The People

At the start of the Eighteenth Century, the mild climate, fertile soil, and the Schuylkill River combined to attract European immigrants to Berks County. While Berks County was inhabited by the Lenni Lenape, the area was settled by Swedes in 1701, followed by Germans, English, Welsh, and French Huguenots. Most of the County's eastern section was settled by people migrating inland from the Philadelphia area. In 1752, Berks County was incorporated from parts of Lancaster, Chester, and Philadelphia Counties. In 1772, Berks gave up territory for the formation of Northumberland County, and again in 1811, for the formation of Schuylkill County. Berks County was named for Berkshire, England, home of William Penn's family. Likewise, Reading was named after the main town in Berkshire, England. In 1790, the first Federal Census

of the County reported 30,189 residents, 22,345 of whom were of German descent. Reading Town, the only sizeable settlement, had 2,225 residents.

Reading's early growth was largely influenced by the Schuylkill River which was navigable by flat-bottom boats that carried products, mainly agricultural, to the markets of Philadelphia, and later by the County's early lead in steam railroad growth. Reading's industrial complex attracted a considerable amount of immigrant labor during the late 19th and early 20th centuries, an era of great industrial growth for Berks County. At one time, the County was the largest manufacturer of full-fashioned hosiery in the world.

Since 1900, the County's population has more than doubled, with concentrated development in the City, its urban area, and the larger rural boroughs. In 1951, Berks County became a third class county. Recently, with increased mobility and changes in land utilization, the development pattern reflects continued suburban growth outward from Reading, as well as development in rural land beyond the suburban areas in the direction of Philadelphia, Allentown, and Lancaster. Growth trends in the past several decades indicate that the County should continue to grow at a moderate rate. It is the County's goal to promote a more consolidated development pattern instead of the scattered pattern occurring now. New growth is encouraged to occur within natural service areas of existing and proposed public water and sewer systems, where higher densities and greater variety can be provided.

Today, the City of Reading is still the County's largest municipality, with a 2010 Census count of 88,082 persons. Other municipalities include 28 boroughs (not including a small part of Adamstown Borough that extends into Berks) and 44 townships (see Figure 2.1). About half of these boroughs lie within the Reading Urbanized Area, and the other half serve as trading or manufacturing centers throughout the County. (Develop more/Accurate statement?)

D. Population

A concise analysis of population data is of paramount importance to any comprehensive plan since most of the Plan's elements, such as the Future Land Use Plan and Community Facilities, are predicated on population assumptions.

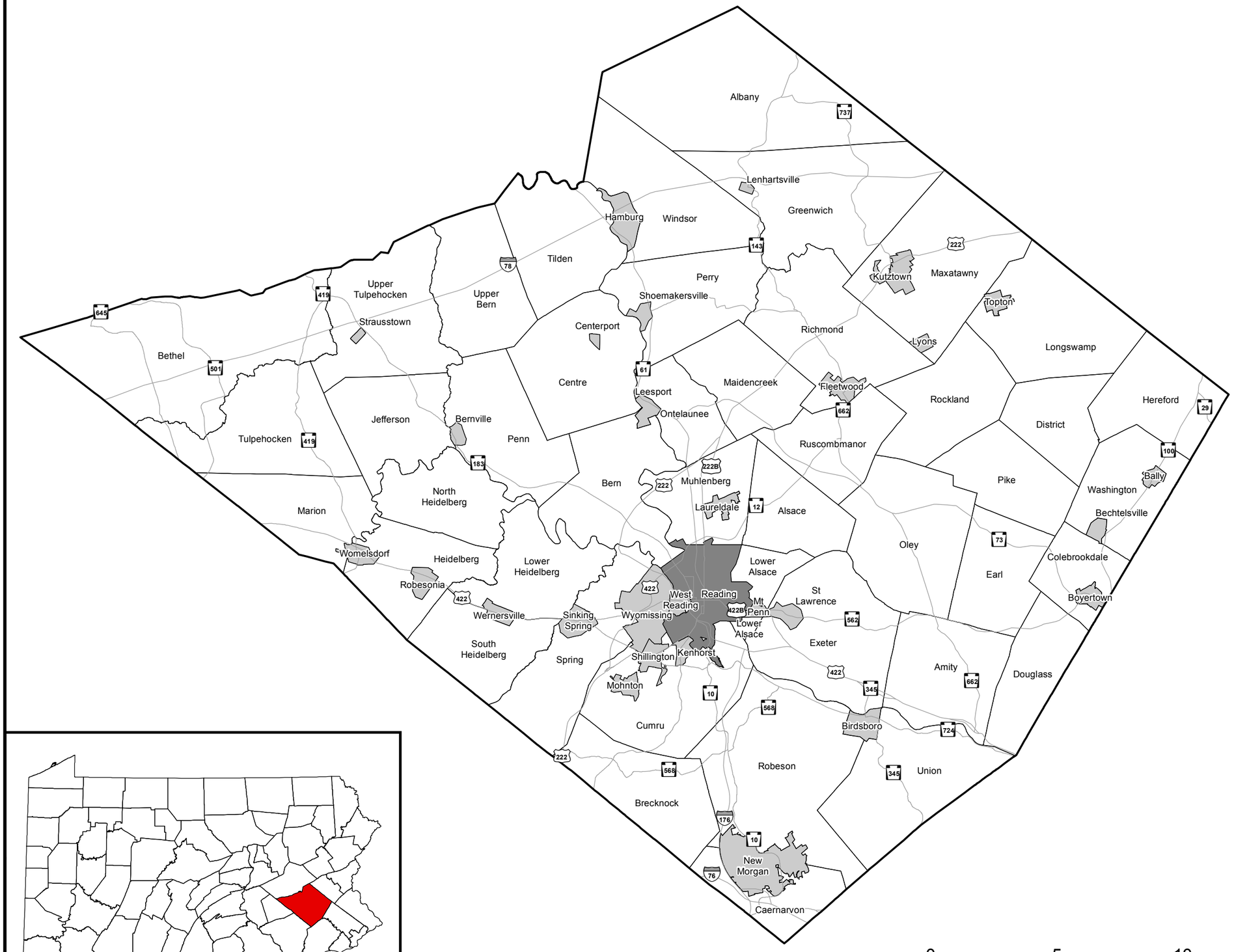
1. Number of Persons

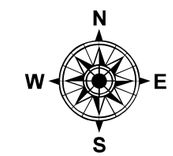
Table 2.1 illustrates the County's population growth since 1900. From 1900 to 2010, the County's total population has more than doubled. With the end of World War II and the beginning of economic resurgence, the number of new families and births rose tremendously. This was the beginning of a period popularly referred to as the Baby Boom. During the 1970's it became apparent that the children of the Baby Boom intended to postpone marriage, childbearing or both in order to pursue educational and career goals. Demographically, the 1970's are referred to as the Baby Bust and generated its own set of consequences such as anticipated labor shortages and concern for the growing percentage of elderly within the total population.

FIGURE 2.1

Berks County Comprehensive Plan Update
Adopted: September 2013

Municipal Boundaries
Berks County, Pennsylvania





Legend

- Berks County Boundary
- Township
- Borough
- City
- Major Roads

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services

Published by the Berks County Planning Commission

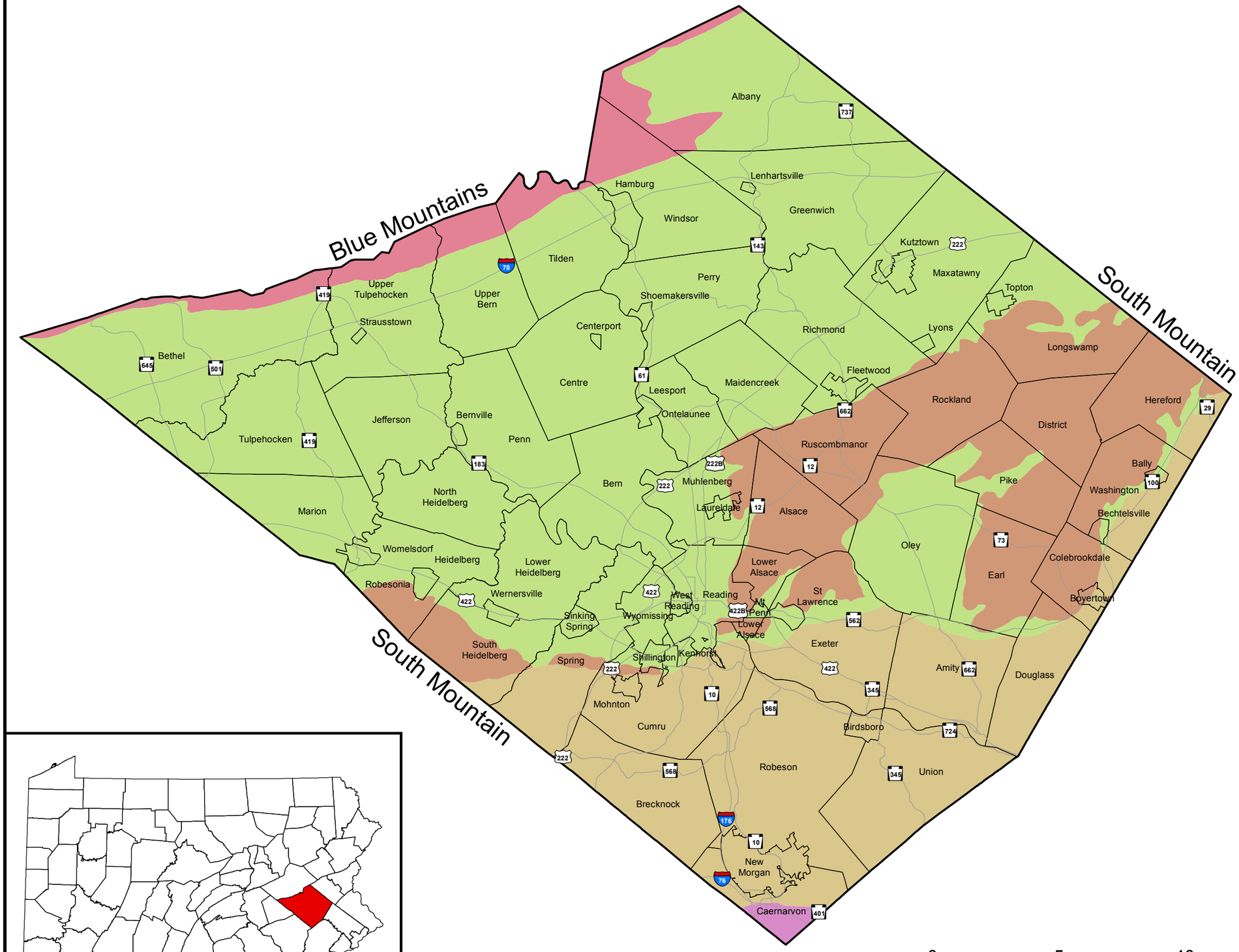
BAB 9/13

www.countyofberks.com/planning

FIGURE 2.2

Berks County Comprehensive Plan Update
Adopted: September 2013

Physiographic Provinces Berks County, Pennsylvania



Legend

- Berks County Boundary
- Municipal Boundaries
- Major Roads

Ridge and Valley Province

- Appalachian Mountain Section
- Great Valley Section

New England Province

- Reading Prong Section

Piedmont Province

- Gettysburg-Newark Lowland Section
- Piedmont Lowland Section

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Pennsylvania Bureau of Topographic and Geologic Survey, Department of Conservation and Natural Resources

Published by the Berks County Planning Commission

BAB 9/13

www.countyofberks.com/planning

Table 2.1
Total Population, Berks County:
1900-2010

Year	Population	Increase	% Change
1900	159,615	- -	- -
1910	183,222	23,607	9.6
1920	200,854	17,632	9.6
1930	231,717	30,863	15.4
1940	241,884	10,167	4.4
1950	255,740	13,856	5.7
1960	275,414	19,674	7.7
1970	296,382	20,964	7.6
1980	312,509	16,131	5.4
1990	336,523	21,012	6.2
2000	373,638	37,115	9.9
2010	411,442	37,504	10.0

Source: U.S. Bureau of the Census

2. Components of Population Change - Natural Increase and Migration

Population growth is chiefly dependent upon two primary factors: natural increase and net migration. Natural increase refers to the net difference between the number of births and the number of deaths. Since population tends to grow geometrically, a normal level of natural increase should add population. Factors such as age composition and fertility greatly influence the level of natural increase. Therefore, the number of births is dependent upon both the number of women in the 15-44 year age group and the social and economic factors that condition fertility trends. While the crude birth rate (total number of births per 1,000 women age 15-44 years) is the most common measure of natality, fertility trends are usually evidenced by the 20-34 year age group. Nonetheless, in 2008 the crude birth rate for Berks County was 12.7.

Mortality figures for most areas of the United States are usually quite stable in comparison to fertility rates. Change is gradual and usually connected with advances in health care practices. Again, factors such as the age of the population can condition the level of mortality. In 2008, the crude death rate was 8.8 per 1,000 persons.

Migration is the other major component of population change. Net migration refers to the total of all persons moving into and out of a specific community. A growing community will demonstrate a positive number of net migrations, while a declining community will show a gradual slowdown or actual loss of persons. Net migration is computed by figuring the difference between census-year enumerated populations and subtracting the corresponding natural increase for that same time period. The result reflects the number of persons moving into the County. It should be noted that census-year populations are enumerated on April 1 of that year while ten-year natural increase includes all births/deaths from January 1 to December 31 of the corresponding year. Table 2.2 shows the ten year natural increase, ten year net migration, and net migration from 1960 to 2009.

Table 2.2
Natural Increase and Net Migration, Berks County:
1960-2009

Year	Population	Ten Year Natural Increase	Ten Year Net Migration	Net Migration Rate
1960	275,414	- -	- -	- -
1970	296,382	15,417	5,551	26.5%
1980	312,509	6,853	9,274	57.5%
1990	336,523	10,341	13,671	56.9%
2000	373,638	6,413	9,419	59.5%
2009	407,125 (A)	13,842 (B)	19,645	58.7% (C)

(A) 2009 Estimate, Compiled by U.S. Bureau of the Census
(B) Natural Increase 2000-2009
(C) Net Migration approximated since 2009 population is estimated
Source: U.S. Bureau of the Census, and PA State Health Data Center

3. Regional Comparison

In order to understand the growth patterns of the County, it is necessary to compare growth rates and trends with counties surrounding Berks and the State of Pennsylvania as a whole. Table 2.3 shows the overall population changes that have occurred within the region since 1970. As shown, the counties adjacent to and surrounding Berks County grew from 3,513,328 persons in 1970 to 5,111,285 in 2010, an increase of 45.5 percent.

Table 2.3
Total Population of Surrounding Counties:
1970-2010

County	1970	1980	1990	2000	2010	% Change 1970-2010
Berks	296,382	312,509	336,523	373,638	411,442	38.8
Bucks	415,056	479,211	541,174	597,635	625,249	50.6
Carbon	50,573	53,285	56,846	58,802	65,249	29.0
Chester	278,311	316,660	376,396	433,501	498,886	79.3
Dauphin	223,832	232,317	237,813	251,798	268,100	19.8
Delaware	600,035	555,007	547,651	550,864	558,979	-6.8
Lancaster	319,693	362,346	422,822	470,658	519,445	62.5
Lebanon	99,665	108,582	113,744	120,327	133,568	34.0
Lehigh	255,304	272,349	291,130	312,090	349,497	36.9
Montgomery	623,799	643,621	678,111	750,097	799,874	28.2
Northampton	214,368	225,418	247,105	267,066	297,735	38.9
Schuylkill	160,089	160,360	152,585	150,336	148,289	-7.4
York	272,603	312,963	339,574	381,751	434,972	59.6

Source: U.S. Bureau of the Census, 1970, 1980, 1990, 2000, 2010 Decennial Censuses

Table 2.3 shows counties in our region and their respective growth rates. As shown, all of the counties along the southern and eastern boundaries of Berks are areas of high population growth. The table illustrates that the outward growth from the Philadelphia and Baltimore areas will play an increasing role in the growth trends of Berks County.

4. Race and Origin

Reflecting the growing diversity of our nation, 83.2 percent of the Berks County population classified themselves as White on the 2010 Census, as displayed in Table 2.4. This is a decrease from 88.2 percent in 2000 and 93.5 percent in 1990. All of the non-caucasion race groups counted in the Census showed increases in their proportion of the population. Proportionally, African Americans comprised 4.9 percent of the population, Asians made up 1.3 percent, American Indian & Alaska Natives were 0.3 percent, and Native Hawaiian & Other Pacific Islanders were less than 0.1 percent of the County. Those who listed Some Other Race were 7.8 percent of the population. Starting with the 2000 Census, persons could list more than one race category for themselves. Two and a half (2.5) percent of County residents listed themselves as having more than one racial component in their heritage.

There is a significant geographic component to any race discussion. Although Countywide (including the City) 83.2 percent of persons listed themselves as White, only 48.4 percent of those in the City made such a declaration. Of the County's 20,143 African Americans, 57 percent of them lived in the City. Asians were the only non-white racial group that showed more persons living outside the City (4,346) than inside (1,039). Slightly more than half (56.3%) of the County's 128 Native Hawaiian & Other Pacific Islander's lived in the City, while 82.7 percent of those who listed 'Other' lived in Reading.

The growth of the Latino community in Berks has become evident in the last three decades. Latinos now comprise the largest ethnic group in the City of Reading, and their proportion Countywide has almost doubled every Census since 1980. Their individual cultures, spending habits and family characteristics will have a greater impact throughout Berks.

5. Households and Families

The decline in the average household size, as seen in Table 2.5, has been slow. Between 1970 and 2000, the average number of persons per household in the United States has moved from 3.14 persons to 2.59 persons, or a decline of over 18 percent. Much of the increase in occupied housing in the 1970's was a reflection of decreased household size. A decline in household size tends to increase the number of households. The long-term decline in household size is evident, resulting not only from economic influence, but also from fundamental changes in the marriage relationship (postponement of marriage until a later age and higher divorce rates) and decreased fertility. Another major contributor to shrinking household size is the increase in the number of single persons choosing to live alone, especially young adults, but also the elderly population. While the slow decline seems to have stabilized nationally, the 2010 household size has actually increased in Berks County.

Table 2.4

COUNTY AND CITY RACE AND HISPANIC ORIGIN: 1990, 2000 AND 2010 CENSUS

		Single Race Reported							
BERKS COUNTY	**Total Population**	**White**	**Black or African American**	**American Indian & Alaska Native**	**Asian[1]**	**Native Hawaiian & Other Pacific Islander[1]**	**Some Other Race**	**Two or More Races[2]**	**Hispanic or Latino, any race**
2010	411,442	342,148	20,143	1,285	5,385	128	32,101	10,252	67,355
Percent of Total	100.0%	83.2%	4.9%	0.3%	1.3%	0.0%	7.8%	2.5%	16.4%
2000	373,638	329,460	13,778	611	3,785	77	20,317	5,610	36,357
Percent of Total	100.0%	88.2%	3.7%	0.2%	1.0%	0.0%	5.4%	1.5%	9.7%
1990	336,523	314,561	10,003	333	2,746	N/A	8,880	N/A	17,174
Percent of Total	100.0%	93.5%	3.0%	0.1%	0.8%		2.6%		5.1%
CITY OF READING									
2010	88,082	42,617	11,624	794	1,039	72	26,538	5,398	51,230
Percent of Total	100.0%	48.4%	13.2%	0.9%	1.2%	0.1%	30.1%	6.1%	58.2%
2000	81,207	48,059	9,947	356	1,296	32	18,125	3392	30,302
Percent of Total	100.0%	59.2%	12.2%	0.4%	1.6%	0.0%	22.3%	4.2%	37.3%
1990	78,380	61,640	7,607	113	1,114	N/A	7,906	N/A	14,486
Percent of Total	100.0%	78.6%	9.7%	0.1%	1.4%		10.1%		18.5%

[1]In 1990, Asian and Pacific Islander were combined into one category.

[2]In 2000 and 2010, respondents were allowed to select more than one race.

SOURCE: U.S. Census Bureau, 1990 Census, 2000 Census, 2010 Census

Table 2.5
Household Size (Persons Per Household)
Berks County & United States: 1970-2010

Year	Berks County	United States
1970	2.95	3.14
1980	2.66	2.75
1990	2.56	2.57
2000	2.55	2.59
2010	2.59	2.58

Source: U.S. Bureau of the Census, Population and Housing Reports, 1970 – 2010

Growth by type of household is another important household component. The Census defines three basic types of households: a married-couple family, a family headed by either a male or female without a spouse, and non-family households which is an individual living alone or with a non-relative. Table 2.6 shows the changes among these types of households since 1970 and Table 2.7 shows additional household information. The consistent decline in the proportion of Married-Couple families is evident along with the related growth in other family types and non-family households.

Table 2.6
Household Growth by Type, Berks County: 1970-2010

		Married-Couple Family		Other Family		Non-Family Household	
Year	Total No. Households	Number	Percent	Number	Percent	Number	Percent
1970	97,523	69,145	70.9	9,331	9.6	19,047	19.5
1980	114,544	72,649	63.4	12,461	10.9	29,434	25.7
1990	127,649	75,440	59.1	15,830	8.1	36,379	28.5
2000	141,570	78,517	55.4	19,946	14.1	43,107	30.4
2010	154,356	80,417	52.1	26,115	16.9	47,824	31.0

Source: U.S. Bureau of the Census, Population and Housing Reports, 1970 – 2010

Table 2.7
Households by Type and Size, Berks County: 2000 and 2010

	Number		Percent of Total	
Households	2000	2010	2000	2010
Total	141,570	154,356	100.0	100.0
Family Household	98,463	106,532	69.6	69.0
Married Couple Family	78,517	80,417	55.5	52.1
With Own Children Under 18 Years of Age	31,370	31,499	22.2	20.4
Female Householder, No Husband Present	14,038	18,464	9.9	12.0
With Own Children Under 18 Years of Age	8,218	10,967	5.8	7.1
Non-Family Household	43,107	47,824	30.4	31.0
Householder Living Alone	34,833	37,793	24.6	24.5

Source: U.S. Bureau of the Census, 2000 and 2010 Population and Housing Reports, Pennsylvania

Although the County's population increased between 2000 and 2010, this growth was not evenly distributed among the County's municipalities. Table 2.8 illustrates the changing geographic composition of the County's population. The Census Bureau defines an urbanized area as a closely settled, contiguous territory surrounding a central city that together must have a minimum population of 50,000 persons. It needs to be noted that neither Urban Area definitions nor data from the 2010 Census have been released as of this writing. The designation does not necessarily follow municipal boundaries. As such, the urbanized area of Berks County consists of the City of Reading, Birdsboro, Kenhorst, Laureldale, Leesport, Mohnton, Mount Penn, St. Lawrence, Shillington, Sinking Spring, Temple, Wernersville, West Lawn, West Reading, Wyomissing, and portions or all of Alsace, Bern, Cumru, Exeter, Lower Alsace, Lower Heidelberg, Maidencreek, Muhlenberg, Ontelaunee, South Heidelberg, Spring, and Union Townships.

The Urban Area consists of both the urbanized area and places located outside of the urbanized area that meet the Census Bureau's urban criteria. This would include most of the rural boroughs and certain pockets of dense development located throughout what is commonly considered the rural area. The suburban area of the County is considered to be the densely populated areas located around the City of Reading, but not the densely populated rural boroughs. As such, it is the urbanized population minus the population of the City of Reading. The rural area population consists of all persons not included within the urban population. One must approach this data with caution since some geographic areas of the County once classified as rural by the Census have been reclassified by the Census Bureau as urban or urbanized because of population growth between Census years. Nevertheless, certain trends are evident. Appendix A shows the population of all of Berks County's municipalities.

Table 2.8
Population by Geographic Area:
1970, 1980, 1990, 2000

	1970		1980		1990		2000	
	Number	%	Number	%	Number	%	Number	%
Urban [A]	188,546	63.6	188,902	60.4	208,662	62.0	272,124	72.8
Urbanized [B]	167,932	56.7	173,450	55.5	187,795	55.8	251,259	67.2
Reading City	87,643	29.6	78,686	25.2	78,380	23.3	81,207	21.7
Suburban [C]	80,289	27.1	94,764	30.3	109,415	32.5	170,052	45.5
Rural	107,836	36.4	123,607	39.6	127,861	37.9	101,514	27.2
Total County	296,382	100.0	312,509	100.0	336,523	100.0	373,638	100.0

[A] Urban Area as delineated by the Bureau of the Census, includes places outside of the Urbanized Area

[B] Urbanized Area as delineated by the Bureau of the Census

[C] Suburban Area is defined as the Urbanized Area minus the City of Reading

[D] Rural Area as delineated by the Bureau of the Census, not including places considered an Urban Area

Source: U.S. Bureau of the Census, Census of Population, 1970 - 2000

6. Population Projections

County population projections were completed by the Pennsylvania State Data Center (PaSDC) in conjunction with the U.S. Census Bureau in November, 2008. The projection methodology

used 2000 decennial census counts as a base and incorporated subsequent birth and death records, fertility information, income tax returns, and other sources of data to determine past trends and future growth by both natural increase and migration. Documentation regarding the Data Center's exact method is available through the Berks County Planning Commission and the PaSDC.

Census 2010:	411,442 persons
2020 Projection:	450,718 persons
2030 Projection:	491,914 persons

Source: PA State Data Center

E. Environmental and Natural Features

1. Geology/Groundwater

The geology of Berks is both unique and fairly complex. This is visible on the Geology Map (Figure 2.3). Underlying Berks County are formations that developed millions of years ago and in various geological time periods. The chronology includes the Precambrian Eon and the Cambrian, Ordovician, Silurian, Triassic, and Jurassic Periods. The Cambrian, Ordovician, and Silurian Periods are from the Paleozoic Era while the Triassic and Jurassic Periods are from the Mesozoic Era. Formations in the Jurassic Period are those which developed most recently while formations in the Precambrian Eon developed earlier in Earth's history.

The oldest formations in Berks County derive from the Precambrian Eon. Formations from the Precambrian are comprised of various types of Gneiss and occur throughout the eastern central portion of the County, with a smaller area found in the western central region, south of Robesonia and Wernersville Boroughs. Formations in the Precambrian are fairly poor aquifers due to the dependency of secondary openings in the parent material.

Formations from the Cambrian Period are found in a band traversing Berks County from the central west border to the central northeast border. This band is thin in the central western portion and thicker in the central eastern portion of Berks County. They are also found sporadically throughout the eastern central region of the County and along the extreme southern border. Formations in the Cambrian Period comprise the majority of the limestone areas of the County. The majority of the formations are composed of various gray limestone and dolomites. A few formations are mainly composed of quartzite. These are some of the best groundwater yielding areas in Berks County, especially the Allentown Formation which is one of the best water yielding limestone in the area.

The most distinguishing characteristic of the formations in the Cambrian Period is the abundance of surface depressions and solution cavities. Due to the relative purity of the limestone that comprises the formations, and the fact that this limestone is soluble in water, it is susceptible to being dissolved by the action of percolating water. Once water enters the soil and reaches the limestone, the calcium carbonate in the limestone will be dissolved. This dissolving of calcium carbonate rock creates a sinkhole. Caves can also occur when large amounts of rock are dissolved.

Berks County has many caves around the northeast portion of the County. Some of the more famous caves of the County are Crystal Cave, Onyx Cave, Schofer's Cave, Temple Cave, Hobo Cave, Dragon Cave, Dreibelbis Cave, and Pinnacle Cave. Some of these caves such as Dragon

Cave have a rich background of folk and Indian lore. Most of the caves listed above have been closed due to safety issues. However, Crystal Cave is still commercially open. Onyx Cave is privately owned and is accessible for educationally oriented visits.

The most abundant formations in Berks County are found in the Ordovician Period. These formations comprise the majority of the northern portion and extend into the northern central portion of the County. Sporadic areas are found in the south central and eastern central portions of the County. They are mainly composed of shales and limestones, with some sandstone present. The materials are mostly gray in color, with some appearing almost black. Formations from the Ordovician Period, such as the Martinsburg Formation, are considered to be moderate suppliers of groundwater. The Beekmantown Group and Hershey and Myerstown Formations, made up of limestone and dolomite, can produce large amounts of groundwater if a channel or fracture in the rock is found.

Formations from the Silurian Period occupy the extreme northern border of Berks County. These formations underlie and give rise to the Blue Mountains. Formations from this period are composed predominantly of sandstones and shales. These rocks are gray and tan in appearance and are often exposed on the surface.

Formations from the Triassic Period are found predominantly in the southern portion of Berks County. Additional areas exist along the extreme eastern boundary of the County which includes portions of Colebrookdale Township through Hereford Township. Formations from this time period are comprised predominantly of quartz conglomerate, sandstones, mudstones, limestones, and shale. A few of the formations found in the Triassic Period include the Brunswick Formation, Hammer Creek Formation and conglomerate, and Stockton Formation. These materials often appear red and gray in color, explaining the reddish hue to the soils found in these areas. The formations from the Triassic generally yield relatively good amounts of groundwater.

The Jurassic Period for Berks County includes two formations. The two formations found are Diabase and Sedimentary strata at Jacksonwald and Aspers. The main geologic composition for this period is diabase and sandstone. The Jurassic Period formations are found in various small, scattered bands throughout the Triassic Period.

The various formations discussed all represent the composition of the County below the soil surface which is visible on the land surface. For instance, the northern edge of the County is made up of the Blue Mountains that are underlain by formations from the Silurian Period. Conversely, many of the rich agricultural valleys, such as those in the eastern portions of the County, are underlain by limestone, which gives the soil its agriculturally productive characteristics.

The highest point in Berks County is located in Bethel Township, in the extreme northwest portion of the County, and is part of the Blue Mountain. The most prominent geologic feature in the County is known as the Pinnacle. The elevation at the top of this sandstone ridge is 1,615 feet above sea level. Another geologic feature found in the vicinity of the Pinnacle is the Blue

Rocks. These are large sandstone boulders that have moved down the sides of the mountains above, forming a glacier of rock.

Due to the complexities of the geologic formations of Berks County, it is difficult to predict what the potential groundwater yield is on a site specific basis. However, each type of geology has an average potential groundwater yield, measured in gallons per minute (gpm) associated with it. Appendix B of this document provides average potential groundwater yield information for the formations found within each geologic period.

Essentially, all of the rocks within the County have openings that contain and transmit water. However, few have primary openings (i.e. voids as a result of original deposition) that are great enough to store and transmit large quantities of water. Secondary openings, (joints, bedding planes, fault planes or zones, shistosity) especially those which have been subsequently enlarged by erosion, which have occurred after the rock was deposited, will account for most of the high yield wells in the County. The more secondary structures transgressed by a well, the better opportunity for large quantities of water.

2. Soils

Soil is the unconsolidated mineral material on the earth's surface, which has been subjected to physical and chemical action over time. Soils are mostly derived from the parent material that underlies them. This parent material gives the soil its specific characteristics. These characteristics may, for example, consist of deep well-drained limestone based soils, or thin poorly drained soils produced from gneiss.

A soil may have moved from its original place of formation through various forces. A soil that has been deposited by the flow of a river or stream is called an alluvial soil. These soils often consist of silt and gravel and will accumulate in depth over time as the river or stream continually deposits material. The force of gravity can also cause a soil to move. Soils that have moved down the sides of hills or mountains in this manner are called colluvial soils. As the material on the higher and steeper slopes of a hill or mountain becomes weathered into soil, it will accumulate and slowly (or occasionally quite rapidly) move toward the base of the mountain. Another force that can move soil is wind. This is particularly evident in very dry regions. This soil, called loess, consists of very fine particles that become airborne due to dry, windy conditions and lack of vegetative cover.

Soils with similar characteristics are grouped into a soil series. There are 44 soil series within Berks County that are described in the *Soil Survey of Berks County, Pennsylvania* which is completed by the National Resources Conservation Service and the National Cooperative Soil Survey, in coordination with the Berks County Conservation District. Soils are also broken down by class. There are eight classes in all, beginning with I and ending with VIII. Class I soils have few limitations that restrict their uses while Class VIII soils are limited in their uses to such things as recreation, wildlife habitat and aesthetic purposes due to hazards such as steep slopes and erodibility. There are no Class V soils in Berks County.

Berks County has both good and poor soils. A large portion of the County consists of agriculturally productive soils, Class I through IV, as evident on the Agricultural Soils Map

(Figure 2.4) and Figure 2.5. The limestone belt found across Berks and the area of limestone concentrated in the eastern central portion of the County, primarily in Oley Township, yield the greatest amounts of Class I soil. The Oley Valley is one of the most productive agricultural areas in the County. The soils of the Oley Valley are derived from the underlying limestone. The reason these soils are so productive is due partly to the geologic characteristics of limestone. Limestone allows soil to percolate water rather rapidly, preventing flooding and excessively high water tables.

Limestone soils are generally deep and the limestone rock allows a soil derived from it to maintain a fairly neutral pH level. This is due to limestone's basic composition of calcium carbonate. Calcium carbonate tends to neutralize acids which provide the soils derived from it a natural buffer against acidic infiltration. Another benefit of a good soil is its ability to filter percolating water, and provide clean, sub-surface aquifers. This process of recharging groundwater supplies is best achieved on Class I and II soils.

Even though a soil may be considered as Class I, it may still have problems that limit its use. The limestone soils, while being one of the most productive agriculturally, can be very hazardous if used inappropriately.

There is a band of sinkhole-prone areas traversing the County that overlies the limestone band. There is also an area of sinkhole-prone soils in and around Oley Township. A sinkhole is the common name given to a depression in a limestone soil surface. These depressions can vary in size and may open in the bottom exposing cavities in the bedrock below. A sinkhole develops when underground channels and cavities, formed by water percolating through the soluble limestone bedrock, collapse allowing the soil lying above to fall into them. The development of a sinkhole is usually gradual but can be fairly rapid. A heavy rain may expose an underground cavity in a matter of hours, causing soil to occupy the void and leave a depression or sinkhole.

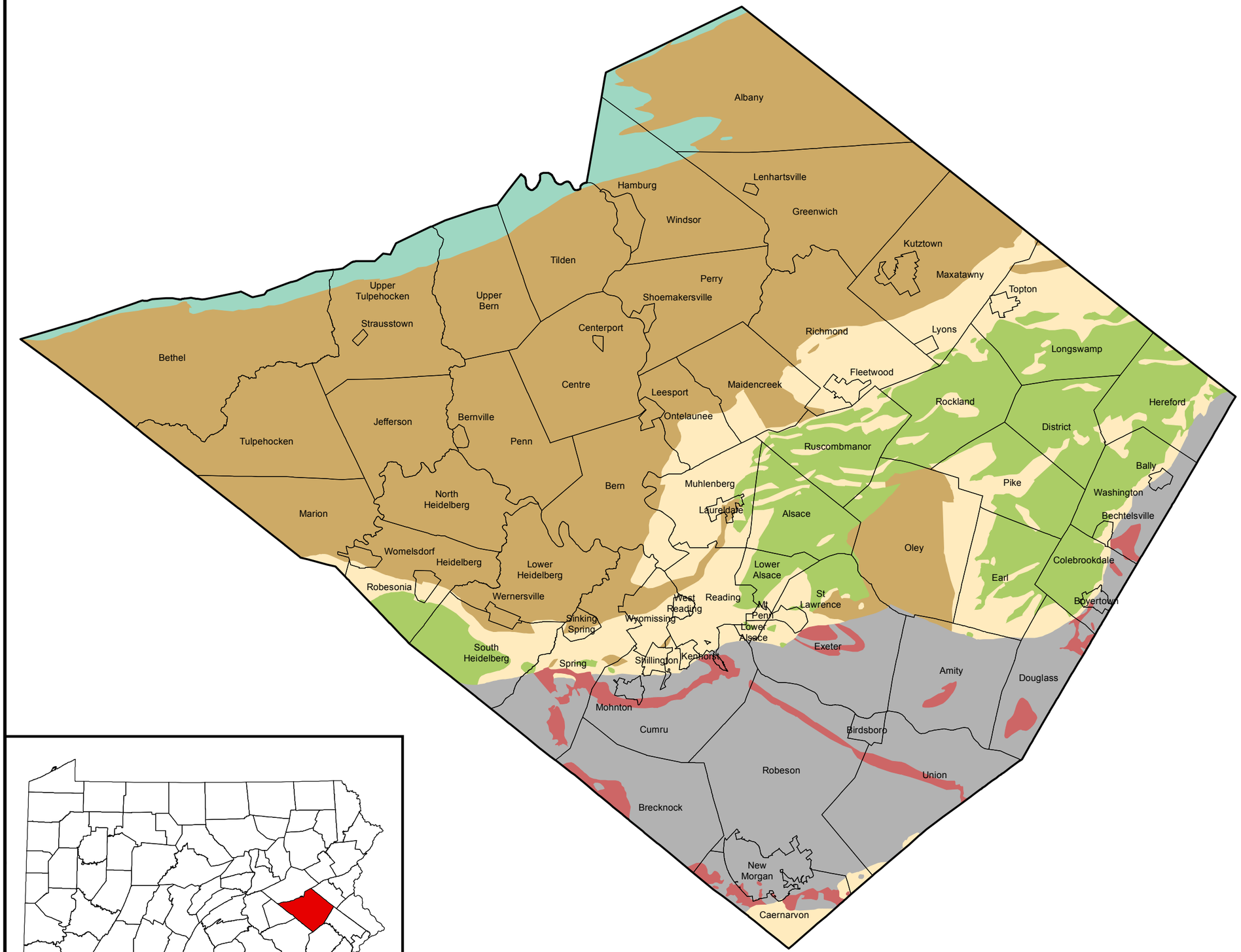
A sinkhole can be a problem for on-lot septic systems. Since a sinkhole allows for very rapid percolation of water and functions as a direct link to underground water supplies, a sinkhole located in the vicinity of a septic system may allow for the flow of untreated wastes into an underground water supply. Any material (garbage, chemicals, etc.) when deposited in or near a sinkhole may eventually find its way to groundwater supplies.

Another problem with soils in Berks County is the infiltration and percolation of water. Soils that are wet, shallow, or on steep slopes need to be studied carefully before being used. Unfortunately, development on unsuitable soils occurs and the results can be disastrous. A housing development started on a soil, which at first seems to be appropriate, could, due to the soil association and class (as described above), become inundated with excess runoff. This scenario could be avoided by better knowledge of soil characteristics.

FIGURE 2.3

Berks County Comprehensive Plan Update
Adopted: September 2013

Geology
Berks County, Pennsylvania



Legend

- Berks County Boundary
- Municipal Boundaries

Geologic Period

- Precambrian
- Cambrian
- Ordovician
- Silurian
- Triassic
- Jurassic

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Pennsylvania Bureau of Topographic and Geologic Survey, Department of Conservation and Natural Resources

Published by the Berks County Planning Commission

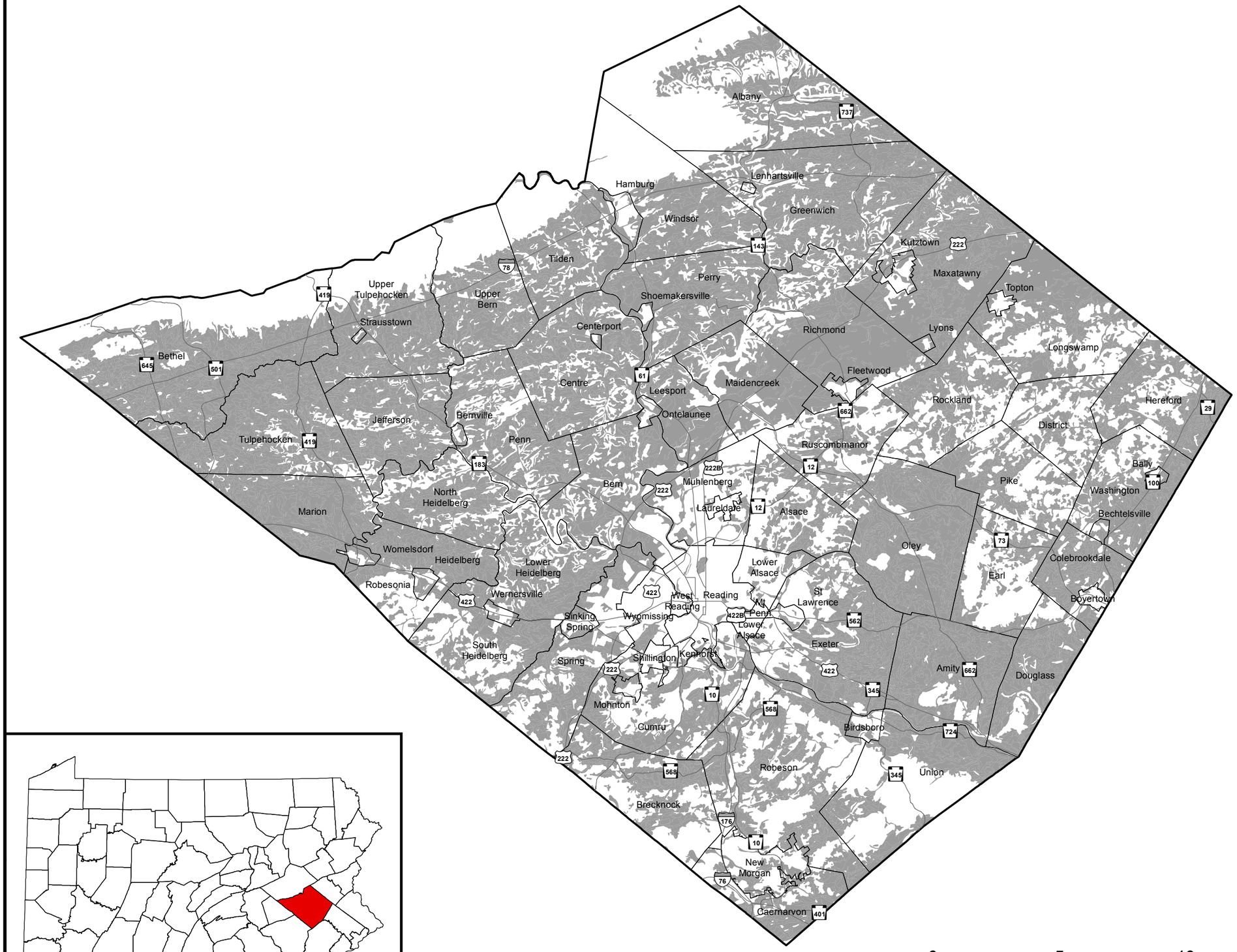
BAB 9/13

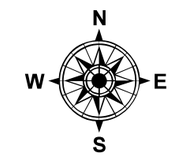
www.countyofberks.com/planning

FIGURE 2.4

Berks County Comprehensive Plan Update
Adopted: September 2013

Agricultural Soils
Berks County, Pennsylvania





Legend

- Agricultural Soils (Class I-IV)
- Soils (Class V-VIII)
- Berks County Boundary
- Municipal Boundaries
- Major Roads

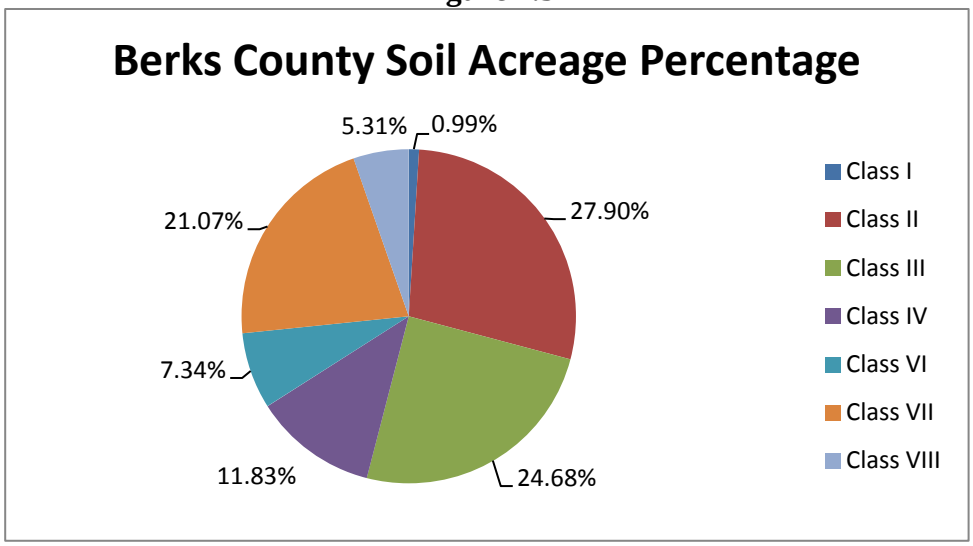
Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services, USDA NRCS

Published by the Berks County Planning Commission

BAB 9/13

www.countyofberks.com/planning

Figure 2.5



3. Mineral Resources

Historically, iron-ore, which occurs as magnetite, limonite (brown hematite), and red hematite, is the most important of the County's abundant mineral resources. Magnetite, averaging 50% iron, was mined throughout the eastern portion of the County, and was used extensively by the many early iron furnaces. Considerable resources still exist in the vicinity of Boyertown, where the State's first iron furnace was established in 1720. The Bethlehem Steel Company had large-scale magnetite mining operations near the southern tip of the County around the Morgantown area. Limonite, which is more abundant than magnetite, was mined in numerous locations, with the best ore carrying approximately 50% iron. Red hematite has also been found in scattered locations, but none in mineable quantity.

Trap rock and limestone are quarried extensively and crushed for use as concrete aggregate and railroad ballast. The principal trap rock quarries are near Birdsboro and Douglassville, while limestone is quarried near Kutztown, Temple, Leesport, Oley, and Evansville. Stone from the latter two locations is used for manufacturing Portland cement at Evansville. Quarry locations are depicted on the Quarries Map (Figure 2.6).

Mining of materials has proven itself vital to Berks County. In the future, it is likely that this industry will continue to be a very valuable part of the County. Appendix C illustrates the annual yield of surface mined materials for 2010.

4. Steep Slopes

A slope is considered to be steep when it has a slope of 25% or greater with respect to a horizontal plane. The steep slopes of Berks County are depicted on the Steep Slopes Map. Steep slopes are scattered throughout the County, with the greatest concentrations being found in the extreme northern portion (the Blue Mountain), the southern portions (the Lowlands), and the eastern portions (the Reading Prong). Most of the steep slopes are wooded, and are a significant element of the landscape. These forested slopes and ridgelines help define our scenic views, and are an essential source of the County's drinking water, wildlife habitat and recreational opportunities. Problems associated with steep slopes are numerous and need special

consideration. It is important that steep slopes be protected from erosion, pollution, and development.

The most common problem associated with steep slopes is the hazard of erosion, particularly if the slope is disturbed. In the most severe cases, slopes will erode so rapidly that they form destructive landslides. When disturbed, steep slopes can produce heavy soil erosion and sediment loading in streams, thereby triggering a cycle of erosion and deposition all the way down to the stream mouth. When rain strikes a steep slope, it runs off rapidly. Excessive erosion and sedimentation has indirect impacts as it can damage aquatic habitats in streams and lakes and it can dramatically reduce reservoir storage capacity. Since steep slopes serve as the headwaters for our streams, they play an important role in the quality of our drinking water supply.

The hazard of erosion can be natural but much of the time it is caused by human influence. Construction on a steep slope requires extensive grading and therefore, the disturbance of the soil and vegetative cover protecting the slope increases the erosion hazard. Development also results in the alteration of natural drainage patterns and the formation of impervious surfaces. Impervious surfaces greatly magnify surface runoff. Topographic constraints often result in roads that are steep, winding, and narrow. These types of roads can pose safety problems with blind curves and steep driveways creating accessibility issues for visitors, residents, and emergency service vehicles. Septic systems for on-lot sewage disposal are impractical on steep slopes due to the rapid downhill flow of improperly treated effluent. Therefore, construction on steep slopes is often difficult, costly, and not a sound planning practice.

The topographic and geological qualities of steep slope areas often create a variety of unique vegetative communities and wildlife habitats. For these ecological reasons steep slope areas require protection in order to preserve biodiversity. Undisturbed steep slopes and their ridgelines have general aesthetic values to many communities due to their visibility. They create a sense of spatial enclosure, contribute to a community's sense of identity, and provide recreational opportunities.

Moderate slopes, between 15% and 25%, can also yield heavy soil erosion and sediment loading of streams. Therefore, many of the same concerns outlined for steep slopes apply to moderate slopes. Moderate slopes are unsuitable for intensive development, and require special design restrictions for the construction of structures, roads, stormwater management facilities, and sewage disposal systems.

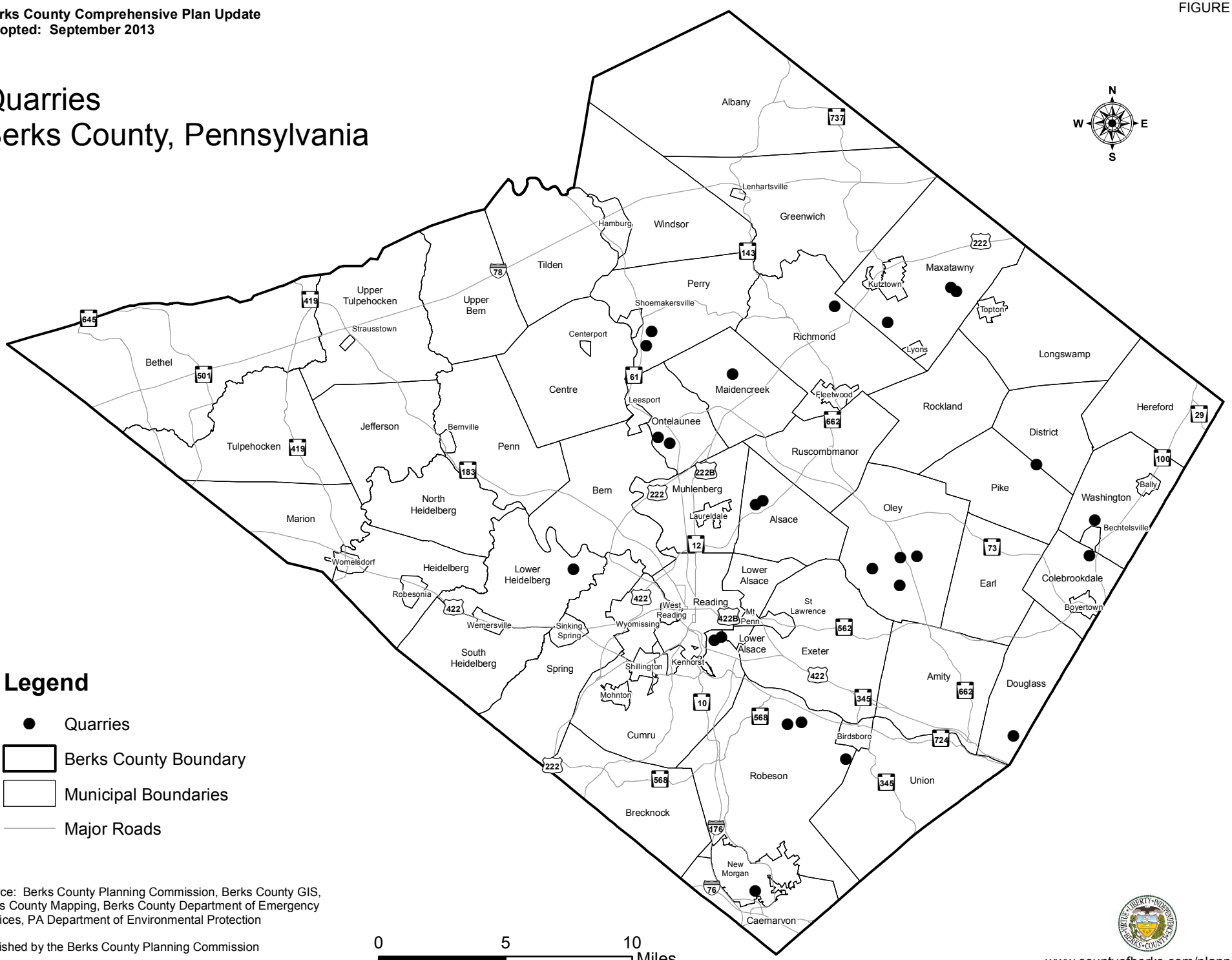
5. Floodplains

A floodplain is a relatively flat or low land area which is subject to partial or complete inundation from an adjoining or nearby stream, or watercourse: and/or any area subject to the unusual and rapid accumulation of surface waters from any source. This land consists primarily of alluvial soils. These soils may be wet a portion of the year, but can still be extremely productive for the growth of vegetation. This vegetation can help filter sediment from surface runoff, stabilize streambanks, reduce soil erosion, and protect water quality. Floodplains provide a natural barrier that protects the stream or river's flow. They can absorb and store large amounts of water and provide aquifer recharge. They also provide excellent areas for species habitat and diversity.

Berks County Comprehensive Plan Update
Adopted: September 2013

FIGURE 2.6

Quarries
Berks County, Pennsylvania



Legend

- Quarries
- Berks County Boundary
- Municipal Boundaries
- Major Roads

0 5 10 Miles

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services, PA Department of Environmental Protection

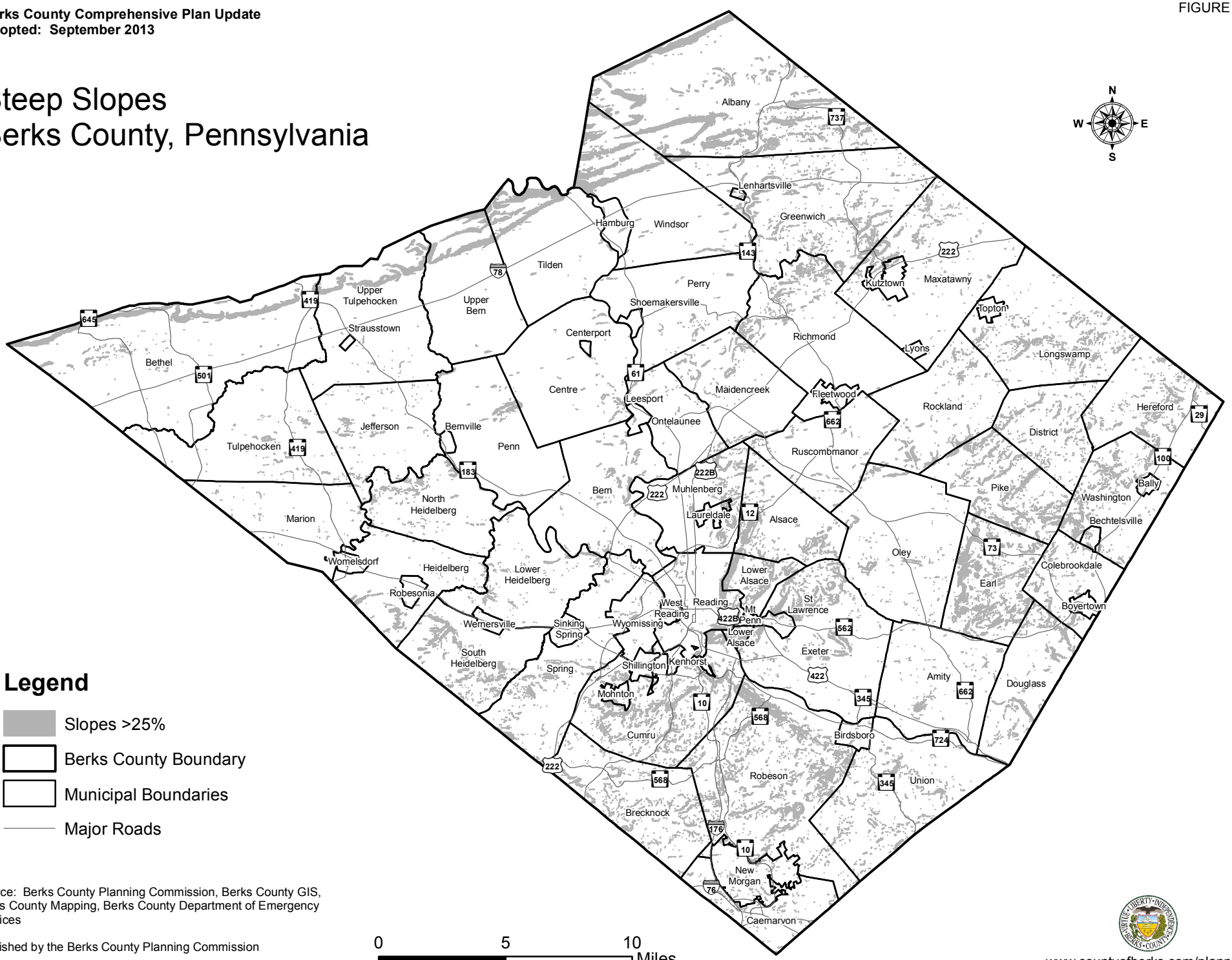
Published by the Berks County Planning Commission

BAB 9/13

www.countyofberks.com/planning

FIGURE 2.7

Steep Slopes
Berks County, Pennsylvania



Legend

- Slopes >25%
- Berks County Boundary
- Municipal Boundaries
- Major Roads

0 5 10 Miles

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services

Published by the Berks County Planning Commission

BAB 9/13

www.countyofberks.com/planning

The floodplains of Berks County are indicated on the Floodplains, Wetlands, and Drainage Basins Map (Figure 2.8). The most prominent floodplain in the County is that of the Schuylkill River. It traverses Berks in a north-to-south direction and is joined by many other streams in its journey. Other fairly prominent floodplain regions of the County include those associated with the Maiden Creek, Manatawny Creek, Saucony Creek, and the Tulpehocken Creek.

Regulation of floodplains can help minimize the threat to human life and property due to flooding. Restricting the allowable uses within a floodplain is an important step in assuring its protection. All municipalities are required by the Federal Emergency Management Agency (FEMA) and the Commonwealth to have ordinances that deal with the use of land within a floodplain. The types of floodplains identified are the 1- and 0.2-percent-annual-chance floodplains. A 1-percent-annual-chance floodplain is an area that is expected to be covered by water once in every 100 years. The 0.2-percent-annual-chance floodplain is an area that is expected to be covered by water once every 500 years.

6. Wetlands

A wetland is an area that exists as a swamp-like region at some point due to poor soils and underlying geology. Wetlands are usually found in lowland areas where the underlying water tables are closer to the soil surface. The area may be quite large in scale or be only a few feet across. A wetland is often associated with a lake, stream or spring, but may exist in a fairly isolated region away from these water features. The major wetland areas of Berks County are shown on the Floodplains, Wetlands and Drainage Basins Map. As shown, many of the wetlands follow the path of streams and rivers.

Wetland areas are unique environments that perform a variety of biological and physical functions. They can be extremely rich areas for plant growth and animal habitat. Wetlands often serve as breeding places for many organisms and are consequently rich in species diversity. However, a wetland does more than simply provide a home and a source of food for organisms. Wetlands protect water sources and can actually help to keep these sources of water clean. They act as natural filters in removing pollutants such as bacteria and sediment from water. This is achieved because the plants growing in and around a wetland will help to trap these pollutants, which are then consumed as food by organisms living in the wetland. The soils found in a wetland are often acidic, and consequently, the plants growing in a wetland are predominantly acid tolerant species. This allows a wetland to receive acidic infiltrations and remain relatively unaffected. Wetlands also retain stormwater runoff and floodwaters, and can facilitate groundwater recharge.

Given the uses and functions of wetlands, it is important that they be preserved in their natural state and protected from destruction. The knowledge of wetland characteristics is important to allow even the most unnoticeable wetland areas to be identified. Most municipalities control the use in and around wetlands by enacting various land use regulations; federal and state regulations also apply.

F. Land Cover

1. Open Fields

The most abundant type of land cover in Berks County is the open field. An open field can be farmland, both active and inactive, pastureland, meadows, and yards. Open fields are found throughout the County, the largest contiguous areas being north, east, and west of the City of Reading and south of the Blue Mountains.

The use of open fields varies greatly and depends largely on the soils and underlying geology. One of the most common, productive, and beneficial uses is for agriculture. Agriculture is one of the County's top industries. Agriculture includes everything from crop production to livestock production.

Open fields are important areas of animal habitat and activity. Many species, such as rodents, use fields for their homes. These species may then serve as food for larger animals such as foxes or birds of prey. These areas are also aesthetically pleasing. They offer relief from crowded urban areas and highways. The development of open fields, especially agricultural fields, means the loss of a food source to humans and other species, as well as a loss of animal habitat and sources for groundwater recharge.

2. Forested Areas

The Forestland Map (Figure 2.9) identifies those areas of forest cover which are of significant size. One of the most prominent, contiguous areas of forest cover in the County is the Blue Mountain Region, which is found along the northern boundary of the County. Deciduous trees are the most prevalent types found in this area and in the rest of Berks County. The most common deciduous species in Berks County are the Maple, Beech, Oak and Hickory. Coniferous species in the County, an example being the Hemlock, often favor stream valleys in mountainous and hilly areas. Another prominent area of contiguous forest is the Hopewell Big Woods (HBW) in the vicinity of French Creek State Park, which is located in the southeastern portion of the County. Other prominent areas include the Lowlands region in southern Berks, and the Reading Prong region. However, the wooded areas in these two regions have been fragmented into patches of woodland by development and agricultural activities.

Among the many uses and functions of a forest, perhaps the one that provides the greatest benefit, is its ability to filter pollution, purify, and cool the air in the summer. Woodlands also help stabilize slopes, reduce erosion, provide riparian buffers, muffle noise, absorb odors, and serve as land use buffers. Forests are also extremely important areas for native vegetation, bird and wildlife habitats, and provide recreational opportunities. There are also the economic benefits of forests associated with commercial timbering, provided proper forest management principles are implemented.

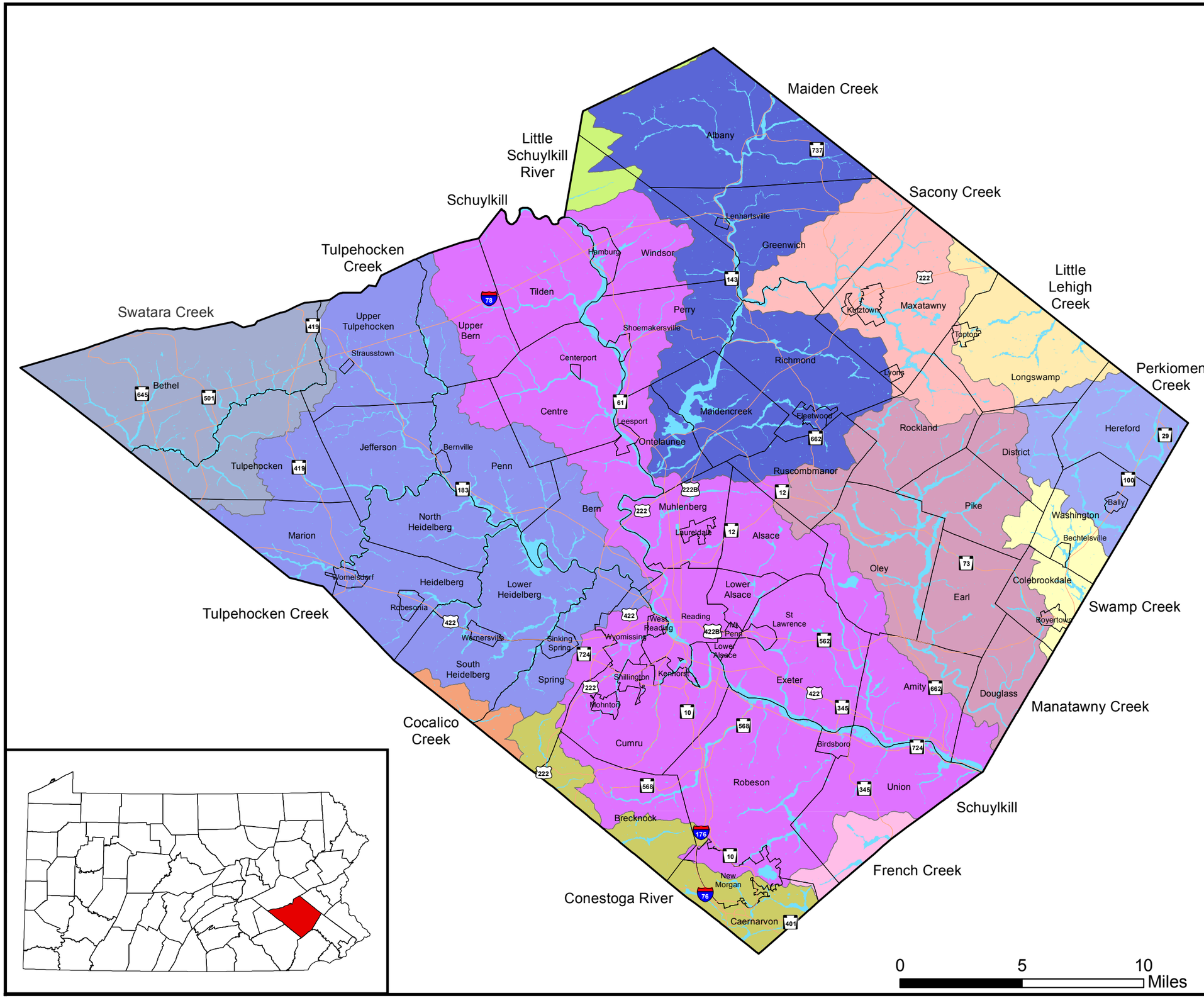
3. Water Features

Lakes, ponds, rivers and streams all constitute water-covered areas in the County. These areas are portrayed on the Floodplains, Wetlands and Drainage Basins Map and also on the Existing Land Use Map. Berks County is divided into thirteen Act 167 state-designated watershed drainage basins. A drainage basin is an area that surrounds a particular stream or river and delivers its surface water runoff and groundwater flow to that stream or river. The major drainage basins of Berks County are also indicated on the Floodplains, Wetlands, and Drainage

FIGURE 2.8

Berks County Comprehensive Plan Update
Adopted: September 2013

Floodplains, Wetlands, and Drainage Basins Berks County, Pennsylvania



Watersheds

- Cocalico Creek
- Conestoga River
- French Creek
- Little Lehigh Creek
- Little Schuylkill River
- Maiden Creek
- Manatawny Creek
- Perkiomen Creek
- Sacony Creek
- Schuylkill
- Swamp Creek
- Swatara Creek
- Tulpehocken Creek
- Water Bodies
- 1% Floodplains
- Berks County Boundary
- Municipal Boundaries
- Major Roads

N W E S

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services, FEMA (Effective Date: July 3, 2012)

Published by the Berks County Planning Commission

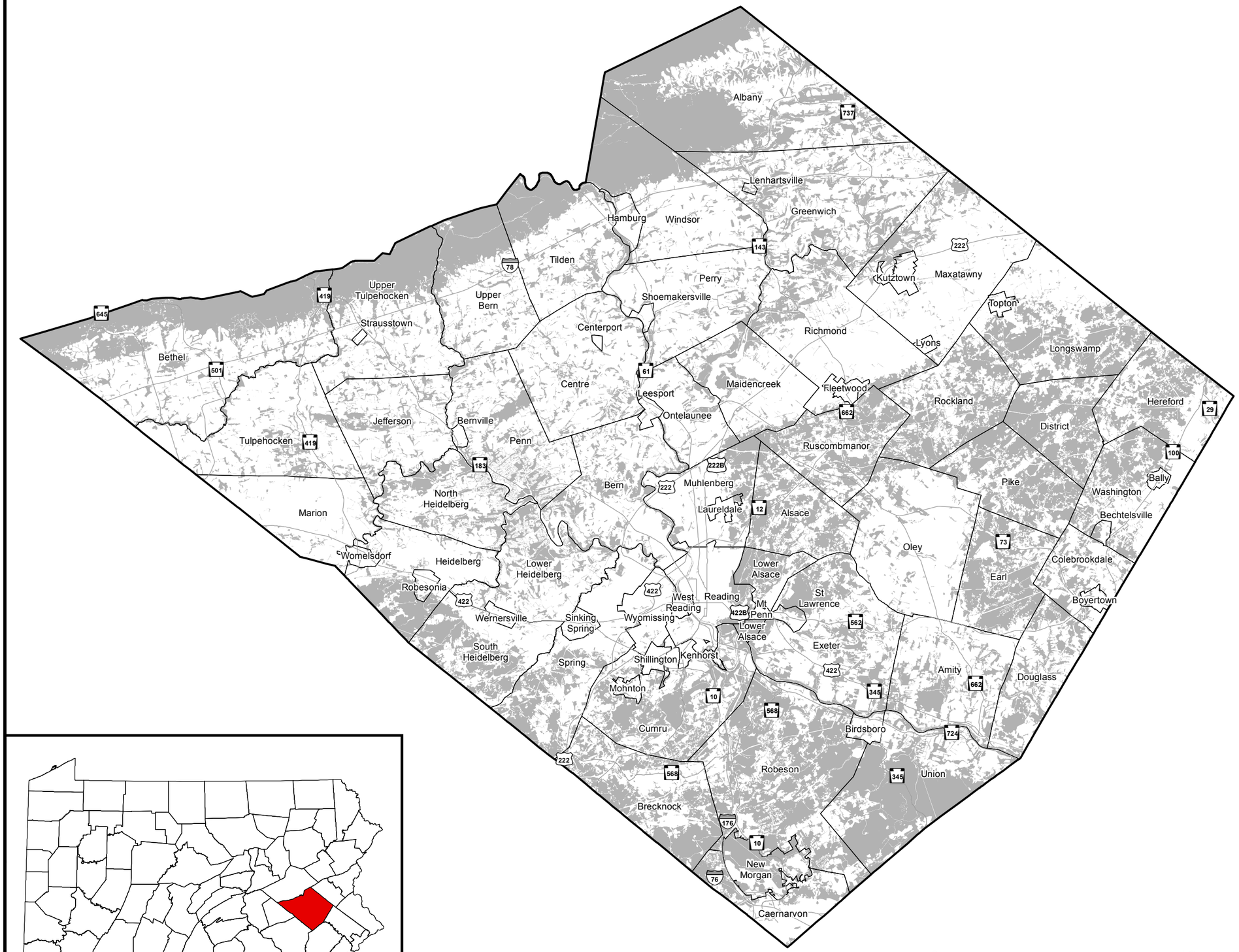
BAB 9/13

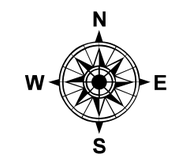
www.countyofberks.com/planning

FIGURE 2.9

Berks County Comprehensive Plan Update
Adopted: September 2013

Forested Areas
Berks County, Pennsylvania





Legend

- Forested Areas
- Berks County Boundary
- Municipal Boundaries
- Major Roads

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services

Published by the Berks County Planning Commission

BAB 9/13

www.countyofberks.com/planning

Basins Map. The Schuylkill River drains the majority of the County and eventually empties into the Delaware River and its Bay. Other streams in northwestern and southwestern Berks County drain into the Susquehanna River and Chesapeake Bay. Berks County contains two lakes of significant size. Lake Ontelaunee, formed by a dam on the Maiden Creek, is found in the northern central portion of the County, lying in Ontelaunee and Maidencreek Townships. It functions as a water supply reservoir for the City of Reading. The lake and surrounding lands also provide recreation such as picnicking and fishing. Blue Marsh Lake, formed by a dam on the Tulpehocken Creek, is located in the central western portion of the County. Blue Marsh functions as a flood control project for the Tulpehocken Creek and Schuylkill River, as a source for recreation, and as a drinking water supply. Both lakes provide important areas of animal habitat and support populations of various fresh water fish and aquatic organisms.

There are a vast number of streams and springs that traverse Berks County in a "branching pattern". The Schuylkill River provides the major source of drainage in the area. The various streams drain small areas of the County but most eventually empty into the Schuylkill, contributing to its overall flow. The Schuylkill has its origins in Schuylkill County, immediately north of Berks, and eventually empties into the Delaware River at Philadelphia. In Berks County, the River provides an important source of habitat for both aquatic and non-aquatic species, and is a source for recreation. The Schuylkill is also very aesthetically pleasing and has been classified as a Pennsylvania Scenic River and a Heritage Corridor.

Of the various other water features in Berks, the Maiden Creek and Tulpehocken Creek are two of the most prominent. Both creeks provide important sources of drainage in the County, and provide sources of recreation and species habitat. The majority of the Berks County Parks System lies along the Tulpehocken Creek. The Tulpehocken is a widely recognized trout stream, supporting a variety of these and other fresh water species.

The Commonwealth of Pennsylvania has classified all surface waters according to water uses and water quality criteria which need to be maintained to prevent water quality degradation as defined by federal regulations. This classification system is known as Pennsylvania's Water Quality Standards and is implemented through the Pennsylvania Code, Chapter 93 and Chapter 95. Streams with excellent water quality have been designated by the state as High Quality waters (HQ) or Exceptional Value waters (EV). These streams or watersheds require special water quality protection. Berks County is fortunate to have numerous HQ and EV streams, and the list continues to grow. While HQ and EV streams are found throughout Berks County, higher concentrations are found in the Oley Hills, South Mountain, Hopewell Big Woods, and Kittatinny Ridge regions due to the abundance of undeveloped wooded areas. An up-to-date list of the classified streams for Berks County is available in the Pennsylvania Code, Chapters 93.9f, 93o and 93d.

G. Environmental Problems within Berks County

1. Pollution

Many individuals see air and water pollution as being the most harmful influences to the natural world. These factors have certainly been felt in Berks County but they are only a small part of the pollution problem. Pollution exists in many forms: air, water, noise, and thermal. The misuse and excessive development of land can even be considered pollution. When one considers

pollution in its broadest sense, the problems become increasingly obvious. Berks County has its share of these problems. Pollution can be divided into two basic categories: point sources and non-point sources. Point sources are those which have easily identifiable origins, such as the discharges from a specific industry. Non-point sources exist on a much broader scale and often cannot be pinpointed, such as increased sedimentation in a river or stream. Some pollutants are difficult to classify as to whether they are point or non-point in origin.

The sources that are blamed for the majority of the Earth's pollution are point sources. In Berks County, as elsewhere, one of the most common types of point source is industry. Industries are not necessarily heavy manufacturing plants. They can consist of a variety of different types of plants from very light manufacturing or processing to very large steel mills. Most industries, commercial buildings and businesses generate some type of identifiable waste. However, some of these generate waste that needs to be discharged either into neighboring water bodies (streams, rivers) or into the air. To discharge wastes in these manners requires that a permit(s) be obtained, typically from the Pennsylvania Department of Environmental Protection (DEP).

Agricultural operations can sometimes affect water quality. The use of Best Management Practices, Conservation Plans, and Nutrient Management Plans can help to control these affects.

Another type of pollution source in Berks County is septic effluent. The process of on-site sewage disposal was discussed in the soil section. Also discussed was what happens when this sewage is disposed of improperly due to poor soils and underlying geology. When this effluent is disposed of improperly it may reach groundwater or surface water supplies and become a pollution source.

Septic effluent can be considered both a point and non-point source of pollution. Sewage treatment plants discharge effluent into streams or rivers often. In this way, the effluent has an identifiable source. However, it is more difficult to determine whether the homes in a development, or even if one house, is polluting water supplies with septic wastes. A stream that flows near a home or development may be high in bacteria such as coliform, which is associated with septic effluent but it may be very difficult to determine which home, if any, is the actual source of pollution.

Other non-point pollution sources in Berks County are attributed to homeowner/landscaping and the deposits from erosion and sedimentation. Homeowner and landscaping applications of herbicides, pesticides and nutrients are normally applied in excess of the needs of soil and plant conditions. Appropriate testing should occur prior to application. Once soil erodes from an area, surface water, groundwater or wind will carry it. This soil, once it enters a stream, will become sediment and have detrimental effects on the stream's ecosystem. Generally, the precise source of sediment in a stream will be indefinable. Even though sediment is a natural material that is usually found in a stream, the abuse of the surrounding soils will often cause undesirable levels to accumulate to the point of it becoming a pollutant. Sediment and nutrient loading has been identified as a concern for both Blue Marsh Lake (Tulpehocken Creek Watershed Protection Plan and Environmental Assessment, 1997) and Lake Ontelaunee (F.X. Browne, 1994 and Cadmus Report, 1998).

There are also natural types of pollution existing in Berks County, such as radon. Radon is an invisible gas that comes from the decay of radium compounds that are found in trace amounts as a natural part of the rocks and soil. The radon gas will diffuse into the atmosphere at a rate dependent upon the size and frequency of fractures and fissures in the underlying rock. The geologic area known as the Reading Prong, underlying a section of Berks County, produces a very high level of radon. Since radon is a very heavy gas, it will accumulate in closed spaces such as the basements of homes creating a potential health risk if higher than humanly acceptable. DEP has detection kits available and standard methods for mitigating radon in homes.

2. Loss of Sensitive Flora & Fauna

The most environmentally important areas often support populations of extremely sensitive flora and fauna. Unfortunately, these sensitive areas, due to their natural beauty and unique features, attract development as well.

In Berks County environmentally sensitive regions exist in a number of forms accounting for the majority of the non-agricultural open land remaining in the County. Bogs, swamps, marshes, meadows, grasslands, open fields, deciduous and evergreen forests, mountains, streams, lakes and even caverns are all environmentally sensitive areas in Berks County. These areas are environmentally important because they provide habitat for threatened or endangered plants or animals. These species are listed and described in the Natural Areas Inventory. This is a publication compiled by the Nature Conservancy and the Berks County Planning Commission in 2001. The top five sites listed in this publication for protection are:

- Blue Mountain
- Lobachsville Wetland, Pine Creek Watershed
- Neversink Mountain
- Pine Swamp
- Schofer Cave/ Sacony Wetland

3. Solid Waste Disposal

The most common method of solid waste disposal in Berks County is the landfill. Currently, there are four such landfills that operate in the County. The Western Berks landfill located near Reading, the Rolling Hills Landfill located in Earl Township, the Pioneer Crossing Landfill in Exeter Township, and the Conestoga Landfill (BFI) located in New Morgan Borough as depicted on the Landfills Map (Figure 2.10). The Pottstown Landfill, with a portion located in Douglass Township, was operational until it closed in 2004.

A landfill consists of a large pit into which wastes are placed. These wastes are then covered with soil material and allowed to decompose over time. The pit is lined with a film that collects the contaminated water and liquid (leachate) which percolates through the buried wastes, and deposits it into a holding area or tank. The leachate produced by the landfill can be extremely toxic and must receive treatment before it is discharged into water sources. Many times, this leachate material will leak from the landfill and contaminate surrounding soils and groundwater supplies.

Modern landfills have a methane gas collection system built into them. This collects the gas given off by the decomposing trash. It can be used for electricity generation or other energy needs. A landfill must often be expanded over time to accommodate the disposal of increasing amounts of waste. The expansion of a landfill may often be at the cost of surrounding open, natural lands. The County's Plan for solid waste disposal is governed by the Act 101 Plan.

The National Priorities Listing (NPL) also known as "Superfund" includes those sites across the country that are considered to be the most severely contaminated and, as such, warrant immediate attention for clean-up. Those sites in Berks County that are on or have been proposed for addition to the NPL are identified as follows:

- Berks Sand Pit
- Bally Groundwater Contamination
- Brown's Battery Breaking
- Crossley Farm
- Cryochem Inc.
- Douglassville Disposal
- Price Battery
- Ryeland Road Arsenic

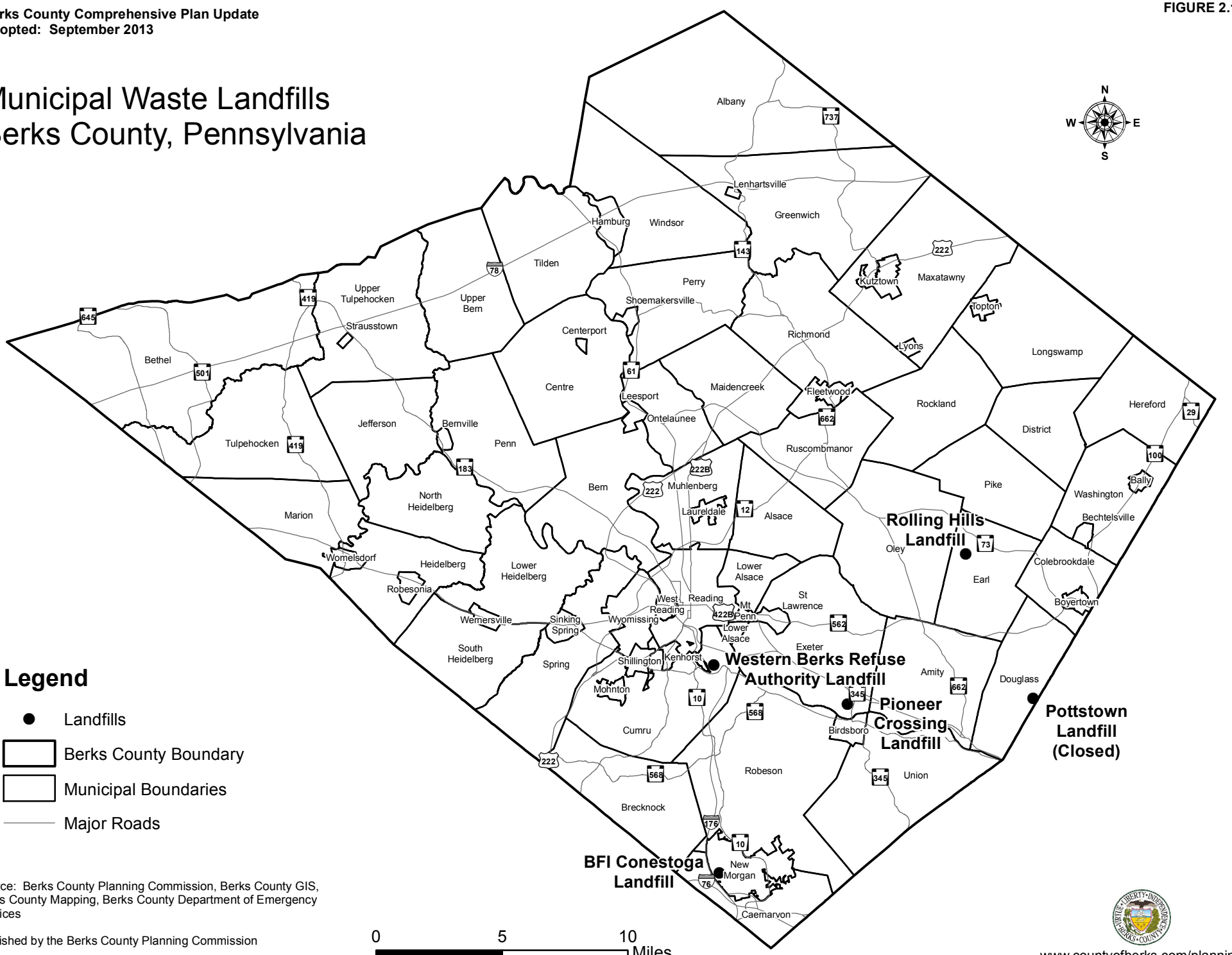
Another type of listing for potentially contaminated or polluted areas is called CERCLIS. This is a listing of sites, compiled by the EPA, which are not presently considered for addition to the NPL but have been identified as areas which may have been polluted to some degree. There are approximately 34 such sites in Berks County which have been made part of the CERCLIS listing. These sites are spread throughout the County and are usually brought to the EPA's attention through the concern of local citizens.

4. Developmental Pressures

The most agriculturally productive soils, Class I and II, are often the first to be developed in an area. These soils have the least amount of construction problems associated with them. Therefore, developing these soils is relatively inexpensive and fairly easy. Low developmental cost will usually trump any agricultural or environmental values. An additional problem in Berks County is the development of Class I and II soils that are underlain by limestone. These sinkhole-prone soils are very productive agriculturally but can be very unstable for any type of construction. A report prepared by William Kochanov, entitled *Sinkholes and Karst-Related Features of Berks County, Pennsylvania*, identifies areas of carbonate bedrock and karst features that have had a reported history of sinkhole occurrence as well as those areas that may be susceptible to sinkhole development.

FIGURE 2.10

Municipal Waste Landfills
Berks County, Pennsylvania



Legend

- Landfills
- Berks County Boundary
- Municipal Boundaries
- Major Roads

Source: Berks County Planning Commission, Berks County GIS, Berks County Mapping, Berks County Department of Emergency Services

Published by the Berks County Planning Commission

BAB 9/13

www.countyofberks.com/planning