

Chapter 2 – Natural, Water, and Historic Resources

The purpose of the natural resources component of the plan is to provide a practical compilation of available environmental data to aid in decision making and directing physical planning and development in the county. By understanding the natural environment and its limits, the county can determine the optimum locations of development areas. Once natural characteristics of the land are mapped and classified, a clear physical/environmental structure will be identified. Natural constraints to future growth and development will become apparent, and government decision-makers, citizens of the county, and developers may also gain knowledge and awareness of the constraints the natural environment may impose on future development.

Climate

Juniata County is located within the Humid Continental climatic region. Weather systems that influence this region generally originate from the interior of the North American continent. Traveling west to east across the continent, these systems are gradually modified by various characteristics of the underlying topography. Sources of moisture for the Humid Continental region that encompass the region originate from the Gulf of Mexico, and occasionally the Atlantic Ocean, to form storms that tend to move along the southeastern coastline. Moisture is also generated from convectional thunderstorms that generally appear during the hot summer months.

The normal succession of high and low pressure systems moving eastward across the continent produce varying degrees of weather changes every few days during the winter and spring of the year. However, during the fall and summer seasons, weather changes are less frequent due to a general slowing down of the atmospheric circulation in the warmer months.

Summers are warm with maximum temperatures reaching in the 80's during the day and dropping to the upper 50's in the evening; however, it is not uncommon to have several days of temperatures in the 90's. Winters are cold and cloudy with daily maximum temperatures averaging in the upper 30's. The county receives on average about 28 inches of snow. (All temperatures represent degrees Fahrenheit)

The average annual rainfall amount of 38 inches is generally distributed throughout the year. Being part of the Humid Continental climatic region of North America, extended droughts are uncommon; however, periods of drought and low precipitation are not uncommon. During 2000-2002 Pennsylvania endured one of the longest droughts in recent history, which adversely affected groundwater and surfacewater resources, vegetation, and wildlife. The result of the drought is an increased awareness of the state's fragile water resources.

Topography



Slopes are an important factor in determining the extent and type of development which can take place. Though erosion and runoff in slope areas are natural processes, development activities located in slope areas can alter the gradients and upset the natural balance. By redirecting water runoff of buildings and impervious surfaces away from the face of steeper slopes, severe soil erosion, drainage problems, and loss of vegetation cover and soil can be avoided. As a general development guide, slopes from 0% to 14.9% are usually suitable for a variety of development types.

Slopes of 15% to 24.9% should be viewed with caution when considering development. Those areas in excess of 25% should be considered not suitable for development.

The topography of Juniata County ranges from low relatively flat areas to areas that have slopes in excess of 25 percent. The majority of the development has been concentrated in areas that have slopes less than 15 percent. **Map 2-1** graphically displays the topography of Juniata County.

Geology

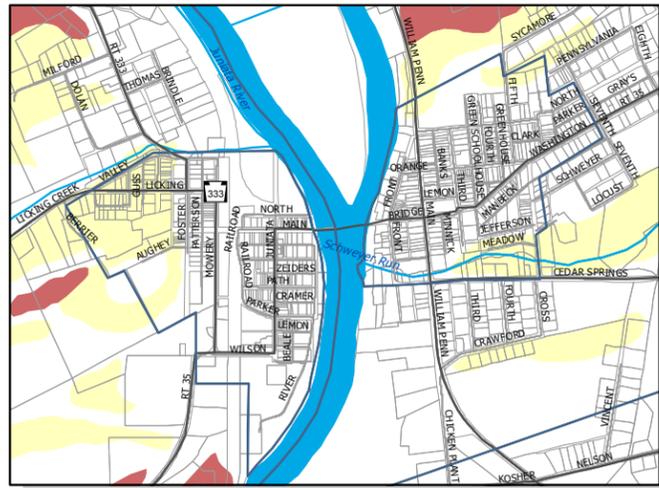
Understanding the geology of Juniata County is important to understanding groundwater quality, drainage patterns, slope, and erosion, and to plan for future development. It is not the purpose of this section to provide a detailed study of geologic formations, but to identify the different formations that make up the geology of Juniata County. However, the groundwater characteristics of each formation will be reviewed since the quality and quantity of groundwater are important considerations in all areas where public water facilities are not available.

The geology of Juniata County varies greatly. The county itself rests on sixteen different geologic rock formations. All of the geologic formations that are found within the county were formed in three different periods during the Paleozoic Era:

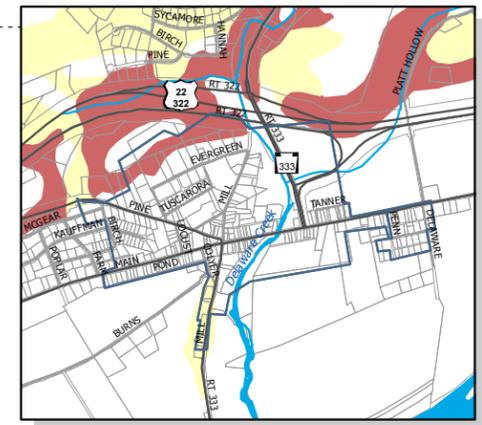
- Ordovician Period (490 to 443 million years ago)
- Silurian Period (443 to 417 million years ago)
- Devonian Period (417 to 354 million years ago)

Table 2-1 provides a more detailed listing and description of each formation and **Map 2-2** displays the geologic formations.

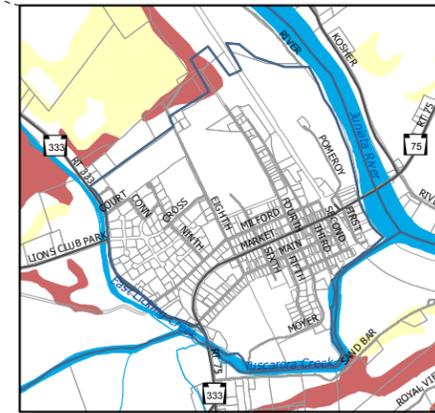
Juniata County Comprehensive Plan



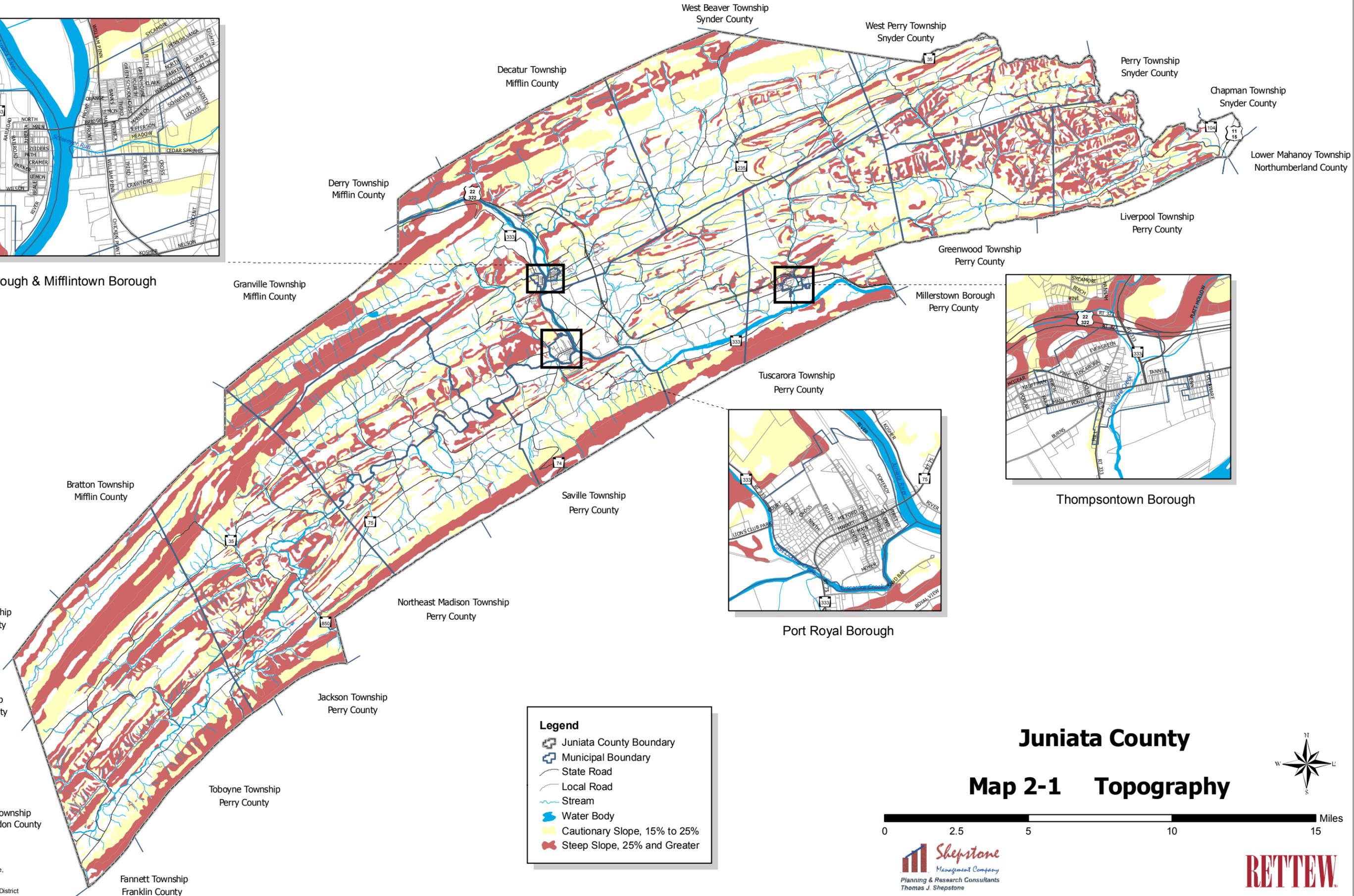
Mifflin Borough & Mifflintown Borough



Thompsontown Borough



Port Royal Borough



Legend

- Juniata County Boundary
- Municipal Boundary
- State Road
- Local Road
- Stream
- Water Body
- Cautionary Slope, 15% to 25%
- Steep Slope, 25% and Greater

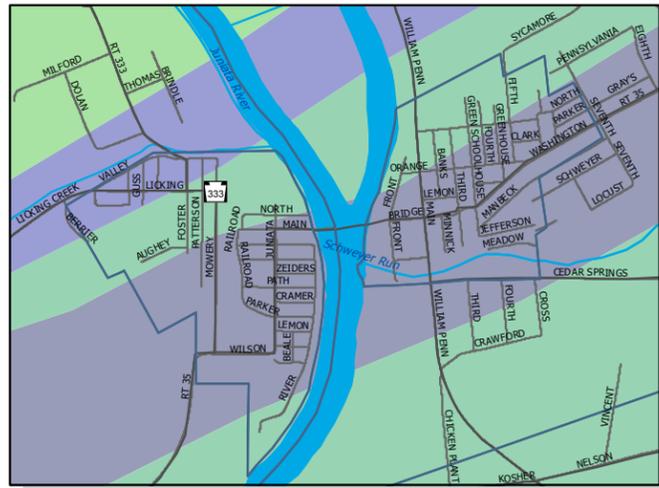
Juniata County

Map 2-1 Topography



RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005, U.S. Fish and Wildlife Service
 Copyright (c) 2006, PennDOT
 Copyright (c) 2006, U.S. Department of Agriculture,
 Natural Resources Conservation Service
 Copyright (c) 2007, Juniata County
 Copyright (c) 2007, Juniata County Conservation District
 Copyright (c) 2007, RETTEW Associates, Inc.

Juniata County Comprehensive Plan



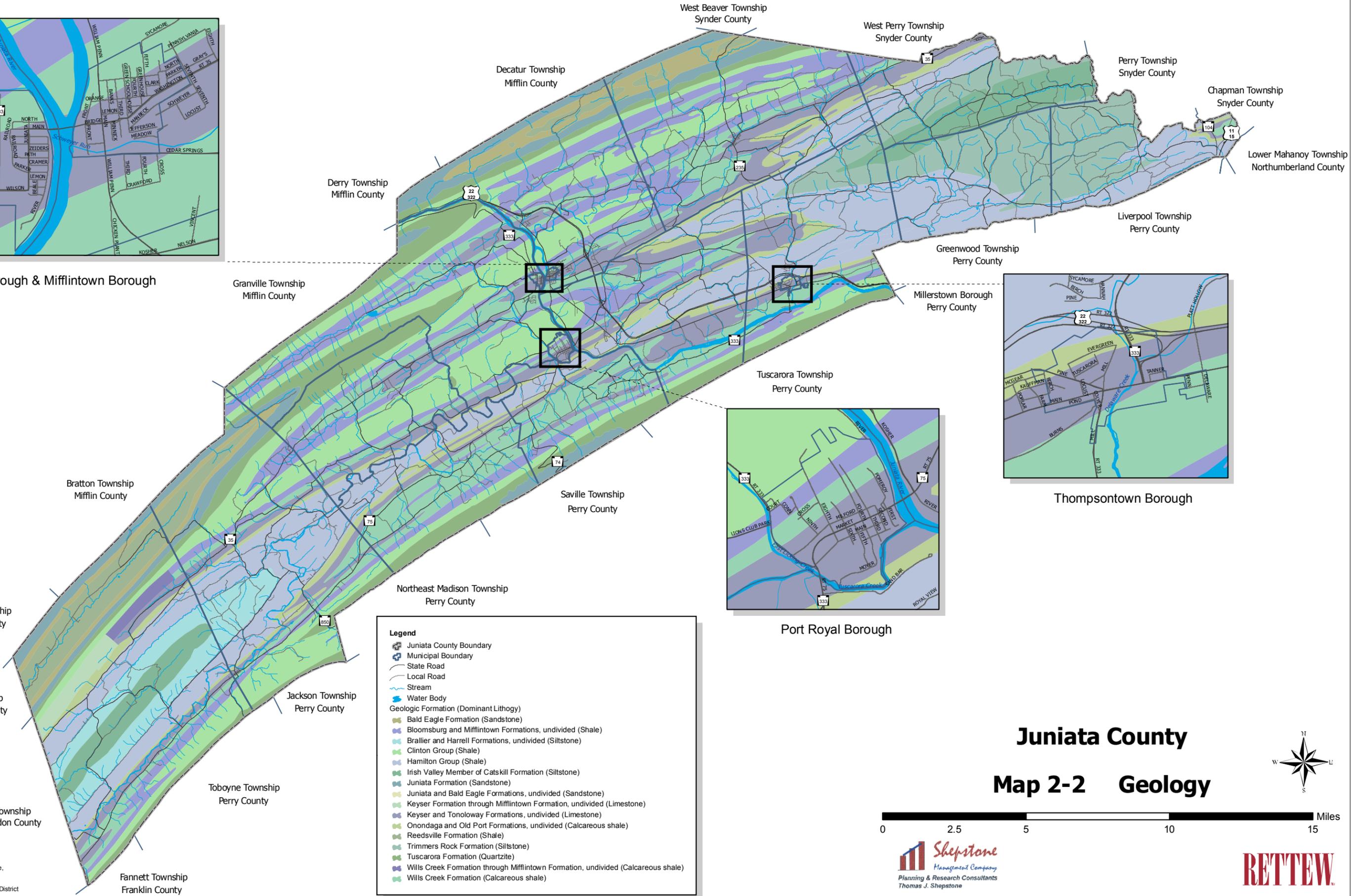
Mifflin Borough & Mifflintown Borough



Thompsontown Borough



Port Royal Borough



Legend

- Juniata County Boundary
- Municipal Boundary
- State Road
- Local Road
- Stream
- Water Body
- Geologic Formation (Dominant Lithogy)**
- Bald Eagle Formation (Sandstone)
- Bloomsburg and Mifflintown Formations, undivided (Shale)
- Brallier and Harrell Formations, undivided (Siltstone)
- Clinton Group (Shale)
- Hamilton Group (Shale)
- Irish Valley Member of Catskill Formation (Siltstone)
- Juniata Formation (Sandstone)
- Juniata and Bald Eagle Formations, undivided (Sandstone)
- Keyser Formation through Mifflintown Formation, undivided (Limestone)
- Keyser and Tonoloway Formations, undivided (Limestone)
- Onondaga and Old Port Formations, undivided (Calcareous shale)
- Reedsville Formation (Shale)
- Trimmers Rock Formation (Siltstone)
- Tuscarora Formation (Quartzite)
- Wills Creek Formation through Mifflintown Formation, undivided (Calcareous shale)
- Wills Creek Formation (Calcareous shale)

RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005, U.S. Fish and Wildlife Service
 Copyright (c) 2006, PennDOT
 Copyright (c) 2006, U.S. Department of Agriculture,
 Natural Resources Conservation Service
 Copyright (c) 2007, Juniata County
 Copyright (c) 2007, Juniata County Conservation District
 Copyright (c) 2007, RETTEW Associates, Inc.

Juniata County
Map 2-2 Geology



Shepstone
 Management Company
 Planning & Research Consultants
 Thomas J. Shepstone

RETTEW



Juniata County Comprehensive Plan

Table 2-1: Geologic Formations Found in Juniata County

Name	Geologic Period	Description	Ground Water
Bald Eagle Formation	Ordovician	Sandstone; gray, reddish gray, brownish gray, hard and quartz pebble conglomerate with few shale partings	No detailed information available; reconnaissance study indicates a maximum yield of 50 gallons/min where present in valleys with perennial streams
Bloomsburg & Mifflintown Formations, undivided	Silurian	Red shale and siltstone with local units of sandstone, thin impure limestone, some green shale	Majority of wells produced more than 30 gpm; fairly good quality for most purposes; low iron content; low to moderate amounts of hardness; moderate amount of dissolved solids
Brallier & Harrell Formations, undivided	Devonian	Primarily siltstone; some shale and black shale	
Clinton Group	Silurian	Fossiliferous shale with intertonguing "iron sandstones" and local gray fossiliferous limestones; quartzitic sandstone	Poor Potential; yields adequate for domestic needs (3 gpm or more) generally with wells from 50 to 150 feet deep
Hamilton Group	Devonian	Primarily shale; some siltstone; black shale, argillaceous limestone, sandstone, limestone, bentonite	
Irish Valley Member of Catskill Formation	Devonian	Made up of mostly siltstone, with mudstone and sandstone	Fair to good aquifer; yields in excess of 300 gpm have been reported; water quality is good to excellent
Juniata Formation	Ordovician	Red, fine-grained to conglomeratic, quartzitic sandstone with well developed cross-bedding and interbedded red shale	Poor potential for yielding water to wells; low yields of 3 to 5 gpm obtainable at a depth of 50 to 150 feet on crests and steep slopes of ridges
Juniata and Bald Eagle Formations, undivided	Ordovician	Gray to olive-gray and grayish-red, fine to coarse-grained crossbedded sandstone or greywacke	
Keyser and Tonoloway Formations, undivided	Devonian and Silurian	Primarily limestone with some shale	
Keyser Formation through Mifflintown Formation	Devonian and Silurian	Limestone; shale; sandstone; mudstone; and dolomite	
Onondaga and Old Port Formations, undivided	Devonian	Calcareous shale is predominant; sandstone; limestone; argillaceous limestone; chert; shale; siliceous siltstone; bentonite	
Reedsville Formation	Ordovician	Dark gray shale with thin sandy to silty interbeds	Yields of 10 to 50 gpm obtained from most wells, also most wells receive water from depths less than 200 feet
Trimmers Rock Formation	Devonian	Predominantly siltstone, also included are shale, sandstone, and black shale	
Tuscarora Formation	Silurian	Sandstone and quartzite; fine to coarse grained; conglomeratic in part; conglomerate may be loosely cemented	Poor potential; median yield approximately 4 gpm; water usually soft and good quality
Wills Creek Formation	Silurian	Greenish-gray shale with local limestone and sandstone zones; contains red shale and siltstone in the lower part of the Formation	An important aquifer; estimates of potential yield indicate about 25% of wells drilled to depth of 200 feet in valleys may be expected to yield 86 gpm or more
Wills Creek Formation through Mifflintown Formation, undivided	Silurian	Mostly calcareous shale, some siltstone, and also shale, sandstone, limestone, and mudstone	

Sources: Engineering Characteristics of the Rock of Pennsylvania; RETTEW Associates

As identified in **Table 2-1** Juniata County contains geologic formations that consist of limestone. Limestone is highly soluble and susceptible to sinkholes due to natural and development contributed stormwater runoff. It can also act as a direct path to the area's groundwater resources, which can pose a significant environmental issue if improperly treated sewage from

"Comprehensively enrich, protect, develop, and preserve Juniata County"

Juniata County Comprehensive Plan

on-lot septic systems, application of agricultural related products, and untreated stormwater runoff enters the aquifer through a sinkhole or an open seam. The identification of limestone areas and the impact development has on that formation needs to be at the forefront of all development proposals.

Soil Characteristics

The composition and qualities of soils play an important role in determining land use activities, such as suitability for on-lot septic systems, flooding potential and the ability to sustain agricultural practices and vegetation.

The Soil Conservation Service of the U.S. Department of Agriculture (USDA), in conjunction with the Pennsylvania Department of Agriculture and the Pennsylvania State University, compiled detailed soil surveys of Juniata and Mifflin Counties that provide information on soil properties. Data contained in these surveys are updated by the USDA Natural Resources Conservation Service (NRCS). Characteristics of soils that are used to distinguish between different types of soils and to determine their potential uses include texture, drainage conditions, chemistry, structure, color, depth to bedrock, and maturity. The texture of a soil can indicate the stability, strength, and drainage of a soil, which are important characteristics to know before farming the land, constructing buildings and roads, or installing waste disposal systems. Soils that are poorly drained have low strength and cannot support structures well. Wet soils also do not allow plant roots to obtain the oxygen they need; thus, plants do not grow well. Chemistry refers to the complex chemical reactions that take place in the soils, measured by the acidity of the soil. All of these characteristics contribute to the identification of soils and their uses¹.

Juniata County is composed of seven different soil associations. The following is a general description from the Juniata and Mifflin Counties Soil Survey of the seven soil associations found in Juniata County, as listed in the Juniata County Natural Areas Inventory.

1. **Hazelton-Laidig-Buchanan Association** – Deep, well drained and moderately well drained, nearly level to very steep soils on primary ridges and on benches and foot slopes. This classification makes up 24% of the county and is primarily forested.
2. **Berks-Weikert-Bedington Association** – Moderately deep and shallow, well drained, nearly level to steep soils on secondary ridges and hills. This classification makes up 33% of the county and is primarily cropland with some pasture and woodlands.
3. **Hagerstown-Duffield-Clarksburg Association** – Deep and shallow, well drained, nearly level to moderately steep soils in upland valleys. This classification makes up 1% of the county and is primarily cropland with some pasture and woodland.
4. **Edon-Opequon-Weikert Association** – Deep and shallow, well drained, nearly level to very steep soils on ridges and in valleys on uplands. This classification makes up 17% of the county and is primarily cropland with some woodland.

¹ Penn State University, College of Agricultural Sciences, Cooperative Extension

Juniata County Comprehensive Plan

5. **Elliber-Kreamer-Mertz Association** – Deep, well drained and moderately well drained, nearly level to very steep soils on secondary ridges. This classification makes up 12% of the county and is primarily cropland with some pasture and woodland.
6. **Chenango-Pope-Holly Association** – Deep, poorly drained, moderately well drained, and well drained, nearly level to gently sloping alluvial soils on flood plains and terraces. This classification makes up 7% of the county and is primarily cropland with some woodland.
7. **Morrison-Hazelton-Clymer Association** – Deep, well drained, gently sloping to moderately steep soils on secondary ridges. This classification makes up 6% of the county and is primarily mixed with cropland, pasture, orchards, and woodlands.

Table 2-6 lists the soils of Juniata County and **Map 2-3** graphically displays the locations of the soils found Juniata County.

Soil Suitability for On-lot Disposal Systems

Soil properties also help to determine the suitability of certain areas for development and the use of on-lot sewage systems as opposed to public facilities. Development typically occurs on prime soils because these areas are absent of the constraints that limit it. The main limiting factors and features of soils used in determining soils suitable for a standard on-lot disposal system (OLDS) are:

- Restricted permeability
- Steep slopes
- Presence of cobbles, stones, or boulders
- Insufficient depth to bedrock
- Flooding
- The presence of high water table
- Underlying cavernous limestone
- Hydric Soils

The United States Department of Agriculture, Natural Resource Conservation Service indicates the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. Rating class terms indicate the extent to which soils are limited by all of the soil features that affect these uses. “Not limited” indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. “Somewhat limited” indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. “Very limited” indicates that the soil has one or more features that are unfavorable for the specified use.² The

² United States Department of Agriculture, Natural Resource Conservation Service, Tabular Data 04/07/2006

Juniata County Comprehensive Plan

degree of suitability of the soils of Juniata County for an on-lot disposal system is described in **Table 2-6**.

Agricultural Characteristics

The rural character and wide open spaces of Juniata County contribute to a strong agricultural presence in the county. In 2000 the agricultural, forestry, fishing and hunting, and mining industries represented 5.46% of the county's industry. To many people, agriculture is synonymous with crop farms. Although crop farming is in the top five of agricultural activity it is not in the top three. Agricultural activity in Juniata County is more synonymous with livestock. In fact, the top three agricultural commodities by value of sales are poultry and eggs; milk and dairy; and hogs and pigs. **Table 2-2** lists the top five agricultural commodities by value of sales.

Table 2-2: Value of Sales by Commodity

Commodity	Value (\$1,000)	State Rank (67 Counties)
Poultry and Eggs	\$32,749	7
Milk and Dairy	\$17,653	23
Hogs and Pigs	\$7,463	10
Cattle and Calves	\$4,869	27
Grains	\$1,148	35

Source: 2002 Census of Agriculture

According to the USDA, the county had a total of 644 farms in 2002. Over the five year period from 1997 to 2002, the total number of farms in the county decreased from 801 in 1997 to 644 in 2002. The total number of acres in farmland also decreased from 96,312 acres in 1997 to 86,203 acres in 2002; however, over that same time period the farm size increased from 120 acres in 1997 to 134 acres in 2002, with the majority of farms falling in the 50 to 179 acres range. The reduction in farms with a corresponding increase in land area is an indication that farms are being bought and combined. In a sense, as one farmer retires, the farm is bought by another farmer and merged with the existing farm.

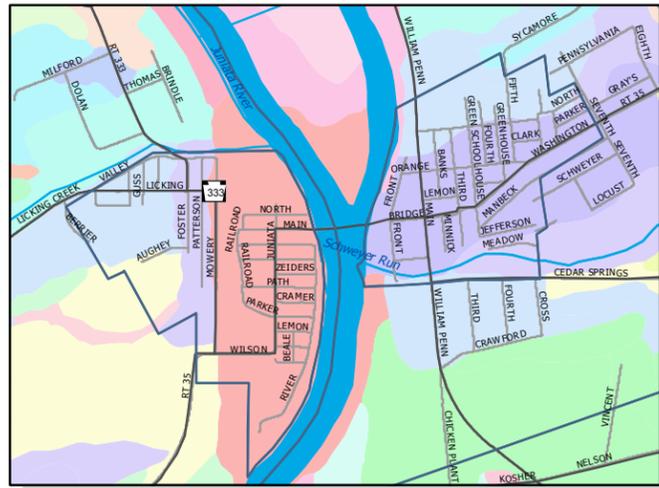
Prime Farmland and Farmland of Statewide Importance

The USDA, NRCS classifies certain soils as Prime Farmland soils based on the following definition:

“Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no rocks. They are permeable

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-6*

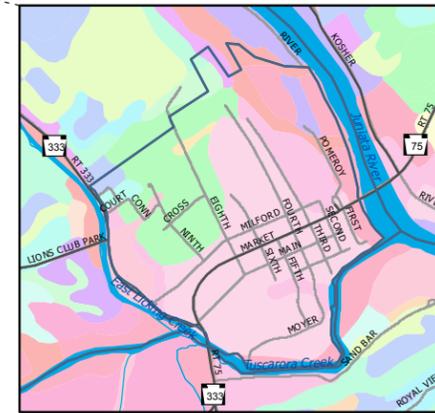
Juniata County Comprehensive Plan



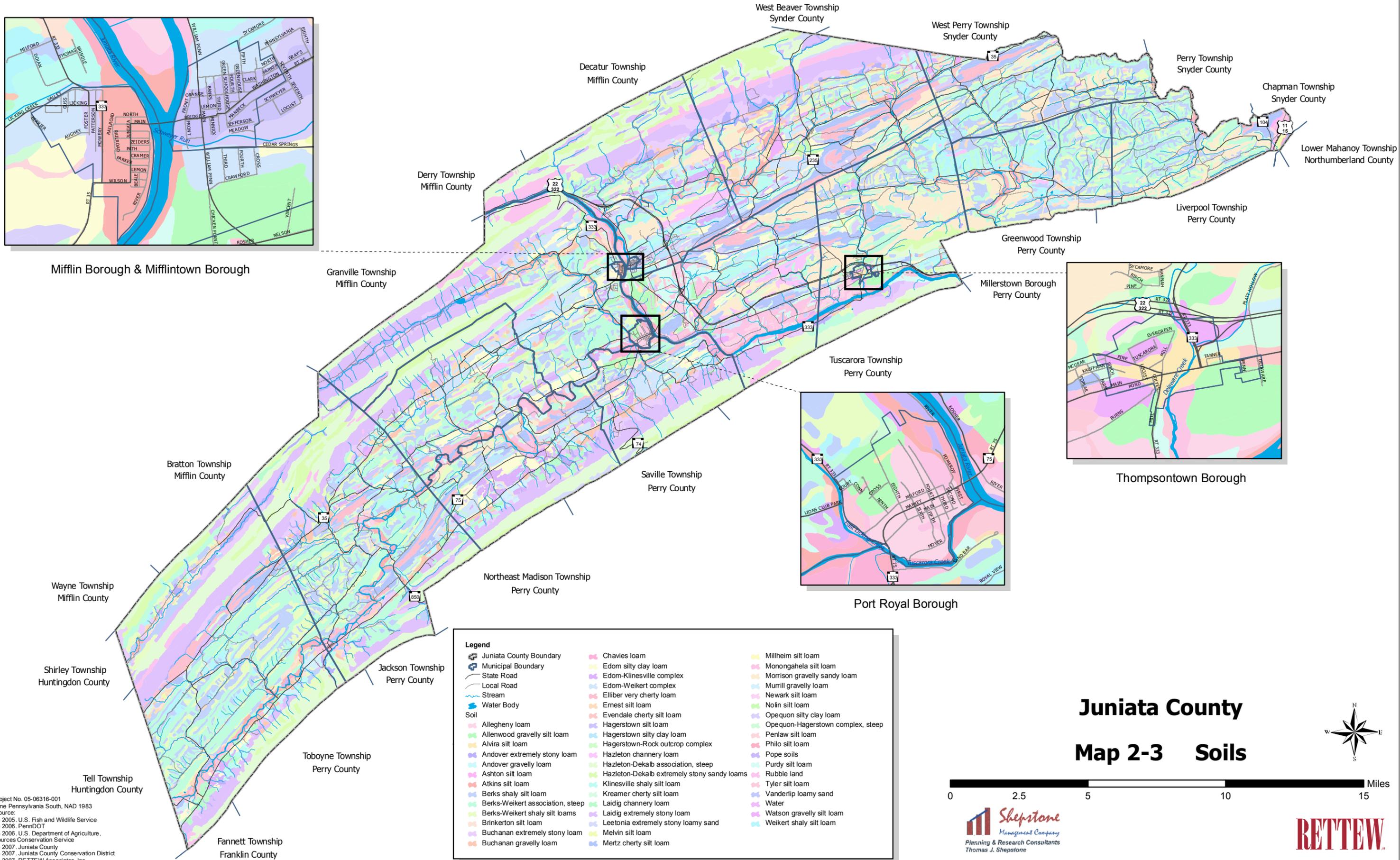
Mifflin Borough & Mifflintown Borough



Thompsontown Borough

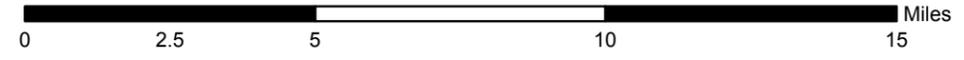


Port Royal Borough



Legend					
	Juniata County Boundary		Chavies loam		Millheim silt loam
	Municipal Boundary		Edom silty clay loam		Monongahela silt loam
	State Road		Edom-Klinesville complex		Morrison gravelly sandy loam
	Local Road		Edom-Weikert complex		Murrill gravelly loam
	Stream		Elliber very cherty loam		Newark silt loam
	Water Body		Ernest silt loam		Nolin silt loam
	Allegheny loam		Evendale cherty silt loam		Opequon silty clay loam
	Allenwood gravelly silt loam		Hagerstown silt loam		Opequon-Hagerstown complex, steep
	Alvira silt loam		Hagerstown silty clay loam		Penlaw silt loam
	Andover extremely stony loam		Hagerstown-Rock outcrop complex		Philo silt loam
	Andover gravelly loam		Hazleton channery loam		Pope soils
	Ashton silt loam		Hazleton-Dekalb association, steep		Purdy silt loam
	Atkins silt loam		Hazleton-Dekalb extremely stony sandy loams		Rubble land
	Berks shaly silt loam		Klinesville shaly silt loam		Tyler silt loam
	Berks-Weikert association, steep		Kreamer cherty silt loam		Vanderlip loamy sand
	Berks-Weikert shaly silt loams		Laidig channery loam		Watson gravelly silt loam
	Brinkerton silt loam		Laidig extremely stony loam		Weikert shaly silt loam
	Buchanan extremely stony loam		Leetonia extremely stony loamy sand		
	Buchanan gravelly loam		Melvin silt loam		
			Mertz cherty silt loam		

Juniata County
Map 2-3 Soils



Shepstone
Management Company
Planning & Research Consultants
Thomas J. Shepstone

RETTEW

RETTEW Project No. 05-06316-001
PA State Plane Pennsylvania South, NAD 1983
Base Map Source:
Copyright (c) 2005, U.S. Fish and Wildlife Service
Copyright (c) 2006, PennDOT
Copyright (c) 2006, U.S. Department of Agriculture,
Natural Resources Conservation Service
Copyright (c) 2007, Juniata County
Copyright (c) 2007, Juniata County Conservation District
Copyright (c) 2007, RETTEW Associates, Inc.

Juniata County Comprehensive Plan

to water and air. Prime farmlands are not easily eroded or saturated with water for a long period of time; these soils either do not flood frequently or are protected from flooding.³”

Juniata County has 18 soil types that are identified as Prime Farmland. Prime Farmland Soils include all soils identified as Class 1, 2, or 3, and Statewide Important Soils are identified as Class 4. The farmland classification of the soils can be found on **Table 2-6** and is displayed in **Map 2-4**.

Agricultural Security Areas

Act 43 of 1981 allows any owner or owners of land used for agricultural production totaling at least 250 acres to submit a petition to the Township Board of Supervisors for the creation of an Agricultural Security Area. If the petition is approved, the participating landowners agree to keep their lands in agriculture in return for certain benefits that the township will give.

Benefits of an Agricultural Security Area are:

- Local governments are not to pass ordinances that unreasonably restrict farm structures or properties.
- Local governments are prevented from defining or prohibiting as a “public nuisance” agricultural activities and operations within the security area.
- Farm operations are protected by discouraging condemnation of agricultural land through eminent domain.
- Acreage in the security area can participate in the Agricultural Conservation Easement Program.

Participation in the Agricultural Security Area program is purely voluntary. There are no penalty provisions for an individual who changes land use while in a security area. The term of an Agricultural Security Area is seven years followed by a re-certification process.

When viewed in conjunction with land in other agricultural programs, the core agricultural areas of the region are identified.

³ SSM, U.S.D.A. No. 18, 1993

Juniata County Comprehensive Plan

The PA Department of Agriculture, Bureau of Farmland Preservation reported the following Agricultural Security Areas in Juniata County:

Table 2-3: Agricultural Security Areas per Municipality

Municipality	Number of Parcels	Total Acres
Beale Township	16	995
Delaware Township	80	5,106
Fayette Township	94	5,284
Fermanagh Township	12	955
Greenwood Township	44	2,929
Milford Township	35	3,527
Monroe Township	8	356
Spruce Hill Township	13	1,568
Susquehanna Township	28	2,197
Turbett Township	20	1,696
Tuscarora Township	31	3,608
Walker Township	66	5,818
Total	436	33,089

Source: Juniata County Conservation District, March, 2009

Map 2-5 graphically shows the location of Agricultural Security Areas in the county.

Agricultural Conservation Easement

An Agricultural Conservation Easement is a legally recorded deed restriction that restricts land to agriculture and open space uses. Most future land development and subdivision activity are prohibited. The agricultural easement is held and enforced by the Juniata County Agricultural Land Preservation Board. In order to qualify for participation in the program a farm must meet the following minimum criteria:

- Enrolled in an Agricultural Security Area
- Contain a minimum of 50 acres
- Contain 50% cropland or pastureland
- Contain 50% of soils capable of agricultural production.

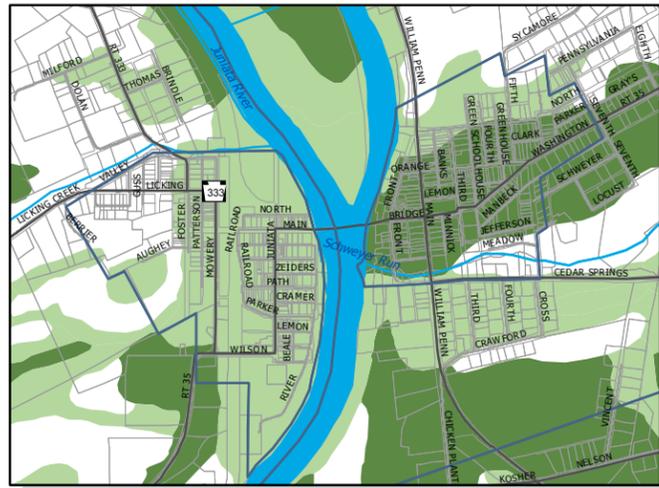
The Juniata County Conservation District reported that as of September 2007, the following farms have been preserved through the Juniata County Farmland Preservation Program:

Table 2-4: Agricultural Easements per Municipality

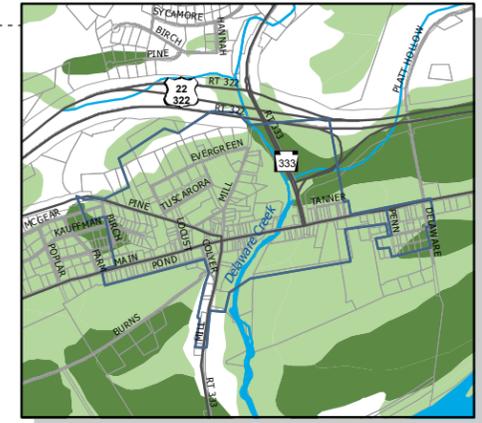
Municipality	Number of Parcels	Total Acres
Beale Township	1	105
Delaware	1	294
Fayette Township	3	203
Spruce Hill Township	4	294
Tuscarora Township	2	333
Walker Township	4	309
Total	15	1,541

Source: Juniata County Conservation District, March, 2009

Juniata County Comprehensive Plan



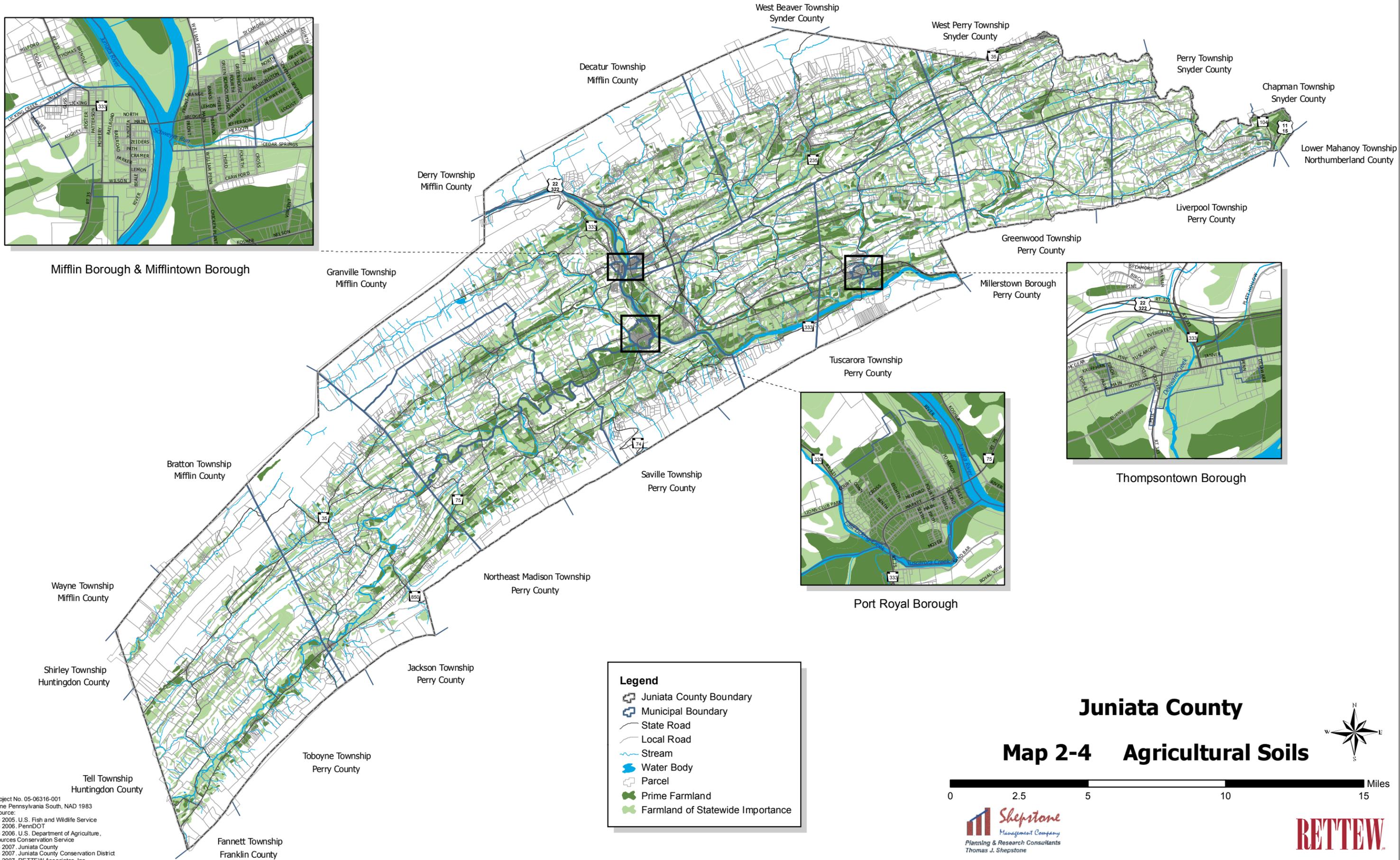
Mifflin Borough & Mifflintown Borough



Thomsontown Borough



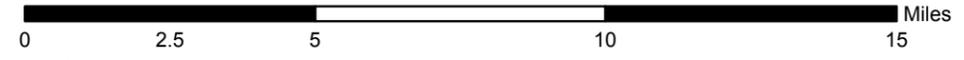
Port Royal Borough



Legend

- Juniata County Boundary
- Municipal Boundary
- State Road
- Local Road
- Stream
- Water Body
- Parcel
- Prime Farmland
- Farmland of Statewide Importance

Juniata County
Map 2-4 Agricultural Soils



RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005. U.S. Fish and Wildlife Service
 Copyright (c) 2006. PennDOT
 Copyright (c) 2006. U.S. Department of Agriculture,
 Natural Resources Conservation Service
 Copyright (c) 2007. Juniata County
 Copyright (c) 2007. Juniata County Conservation District
 Copyright (c) 2007. RETTEW Associates, Inc.

Juniata County Comprehensive Plan

In total, over 1,500 acres of land have been preserved through the county’s farmland preservation program. This represents the beginning of a valuable program that is required to ensure the continued success of the agriculture industry in the county and the protection and retention of vast undeveloped open areas.

Map 2-5 graphically shows the location of the preserved farms in the county.

Central Pennsylvania Conservancy

The Central Pennsylvania Conservancy is also very active in Juniata County. In total the Conservancy has preserved six properties totaling 415 acres. **Table 2-5** lists the preserved property, year it was preserved, and acreage.

Table 2-5: Central Pennsylvania Conservancy Preserved Land

Property	Date	Total Acres
Brady Bryner Preserve	1993	257
Gregory Alan Grening Preserve	1996	23
Grening Preserve Addition	1997	10
Baker Easement	2002	42
Port Royal Wetlands	2003	14
McLaughlin Easement	2004	68
Total Acres = 415		

Source: Central Pennsylvania Conservancy

Table 2-6: Level of Farmland Importance, and OLDS Suitability of Soils in Juniata Co.

Soil Symbol	Soil Type	Farmland Classification	On-Lot Sewage Disposal Suitability
AbB	Allegheny loam, 2 to 8 percent slopes	Prime Farmland	Somewhat limited
AdB	Allenwood gravelly silt loam, 2 to 8 percent slopes	Prime Farmland	Somewhat limited
AdC	Allenwood gravelly silt loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Somewhat limited to very limited
AdD	Allenwood gravelly silt loam, 15 to 25 percent slopes		Very limited
AIB	Alvira silt loam, 2 to 8 percent slopes	Farmland of Statewide Importance	Very limited
AnB	Andover gravelly loam, 2 to 8 percent slopes		Very limited
AoB	Andover extremely stony loam, 0 to 8 percent slopes		Very limited
AoC	Andover extremely stony loam, 8 to 15 percent slopes		Very limited
As	Ashton silt loam	Prime Farmland	Somewhat limited
At	Atkins silt loam	Farmland of Statewide Importance	Very limited
BkB	Berks shaly silt loam, 2 to 8 percent slopes	Farmland of Statewide Importance	Very limited
BkC	Berks shaly silt loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
BID	Berks-Weikert shaly silt loams, 15 to 25 percent slopes		Very limited
BMF	Berks-Weikert association, steep		Very limited
BrA	Brinkerton silt loam, 0 to 3 percent slopes		Very limited
BrB	Brinkerton silt loam, 3 to 8 percent slopes		Very limited

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-9*

Juniata County Comprehensive Plan

Soil Symbol	Soil Type	Farmland Classification	On-Lot Sewage Disposal Suitability
BuB	Buchanan gravelly loam, 3 to 8 percent	Prime Farmland	Very limited
BuC	Buchanan gravelly loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
BxB	Buchanan extremely stony loam, 3 to 8 percent slopes		Very limited
BxD	Buchanan extremely stony loam, 8 to 15 percent slopes		Very limited
CaB	Chavies loam, 2 to 8 percent slopes	Prime Farmland	Very limited
EdB	Edom silty clay loam, 3 to 8 percent slopes	Prime Farmland	Somewhat limited
EdC	Edom silty clay loam, 8 to 15 percent slopes	Farmland of Statewide Significance	Somewhat limited to very limited
EdD	Edom silty clay loam, 15 to 25 percent slopes		Very limited
EeB	Edom-Klinesville complex, 3 to 8 percent slopes		Somewhat limited to very limited
EeC	Edom-Klinesville complex, 8 to 15 percent slopes	Farmland of Statewide Importance	Somewhat limited to very limited
EeD	Edom-Klinesville complex, 15 to 25 percent slopes		Very limited
EfB	Edom-Weikert complex, 3 to 8 percent slopes	Farmland of Statewide Importance	Somewhat limited
EfC	Edom-Weikert complex, 8 to 15 percent slopes	Farmland of Statewide Importance	Somewhat limited to very limited
EfD	Edom-Weikert complex, 15 to 25 percent slopes		Very limited
EIB	Elliber very cherty loam, 3 to 8 percent slopes	Prime Farmland	Very limited
EIC	Elliber very cherty loam, 8 to 15 percent slopes		Very limited
EID	Elliber very cherty loam, 15 to 25 percent slopes		Very limited
EIF	Elliber very cherty loam, 25 to 60 percent slopes		Very limited
ErB	Ernest silt loam, 2 to 8 percent slopes	Farmland of Statewide Importance	Somewhat limited to Very limited
ErC	Ernest silt loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
Ev	Evendale Cherty silt loam	Farmland of Statewide Importance	Very limited
HaB	Hagerstown silt loam, 2 to 8 percent slopes	Prime Farmland	Somewhat limited
HcB	Hagerstown silty clay loam, 3 to 8 percent slopes	Prime Farmland	Somewhat limited
HcC	Hagerstown silty clay loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Somewhat limited to very limited
HcD	Hagerstown silty clay loam, 15 to 25 percent slopes		Very limited
HeD	Hagerstown-Rock outcrop complex, 8 to 25 percent slopes		Very limited
HhB	Hazelton channery loam, 3 to 8 percent slopes	Prime farmland	Very limited
HhC	Hazelton channery loam, 8 to 15 percent slopes	Farmland of Statewide importance	Very limited
HhD	Hazelton channery loam, 15 to 25 percent slopes		Very limited
HSB	Hazelton-Dekalb extremely stony sandy loams, gently sloping		Very limited
HSD	Hazelton-Dekalb extremely stony sandy loams, moderately steep		Very limited
HTF	Hazelton-Dekalb association, steep		Very limited
KIB	Klinesville shaly silt loam, 3 to 8 percent slopes	Farmland of Statewide Importance	Very limited
KIC	Klinesville shaly silt loam, 8 to 15 percent slopes		Very limited

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-10*

Juniata County Comprehensive Plan

Soil Symbol	Soil Type	Farmland Classification	On-Lot Sewage Disposal Suitability
KID	Klinesville shaly silt loam, 15 to 25 percent slopes		Very limited
KIF	Klinesville shaly silt loam, 25 to 50 percent slopes		Very limited
KrB	Kreamer cherty silt loam, 2 to 8 percent slopes	Prime Farmland	Very limited
KrC	Kreamer cherty silt loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
LaB	Laidig channery loam, 3 to 8 percent slopes	Prime Farmland	Very limited
LaC	Laidig channery loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
LaD	Laidig channery loam, 15 to 25 percent slopes		Very limited
LcB	Laidig extremely stony loam, 3 to 8 percent slopes		Very limited
LcD	Laidig extremely stony loam, 8 to 15 percent slopes		Very limited
LDF	Laidig extremely stony loam, steep		Very limited
LtB	Leetonia extremely stony loamy sand, 0 to 12 percent		Very limited
Ma	Melvin silt loam	Farmland of Statewide Importance	Very limited
MeB	Mertz cherty silt loam, 3 to 8 percent slopes	Prime Farmland	Somewhat limited to very limited
MeC	Mertz cherty silt loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
MeD	Mertz cherty silt loam, 15 to 25 percent slopes		Very limited
MnB	Millheim silt loam, 3 to 8 percent slopes	Prime Farmland	Somewhat limited to very limited
MnC	Millheim silt loam, 8 to 15 percent slopes		Somewhat limited to very limited
MoA	Monogahela silt loam, 0 to 3 percent slopes	Prime Farmland	Very limited
MoB	Monogahela silt loam, 3 to 8 percent slopes	Farmland of Statewide Importance	Very limited
MrB	Morrison gravelly sandy loam, 3 to 8 percent	Prime Farmland	Very limited
MrC	Morrison gravelly sandy loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
MrD	Morrison gravelly sandy loam, 15 to 25 percent slopes		Very limited
MuB	Murrill gravelly loam, 3 to 8 percent slopes	Prime Farmland	Somewhat limited
MuC	Murrill gravelly loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Somewhat limited to very limited
Ne	Newark silt loam	Farmland of Statewide Importance	Very limited
No	Nolin Silt Loam	Prime Farmland	Very limited
OpB	Opequon silty clay loam, 3 to 8 percent slopes	Farmland of Statewide Importance	Very limited
OpC	Opequon silty clay loam, 8 to 15 percent slopes		Very limited
OpD	Opequon silty clay loam, 15 to 25 percent slopes		Very limited
ORF	Opequon-Hagerstown complex, steep		Very limited
Pe	Penlaw silt loam	Farmland of Statewide Importance	Very limited
Ph	Philo silt loam	Prime Farmland	Very limited
Po	Pope soils	Prime Farmland	Very limited
Pu	Purdy silt loam		Very limited
Ru	Rubble land	Not rated	Not rated
Ty	Tyler silt loam	Farmland of Statewide Importance	Very limited

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-11*

Juniata County Comprehensive Plan

Soil Symbol	Soil Type	Farmland Classification	On-Lot Sewage Disposal Suitability
VaC	Vanderlip loamy sand, 5 to 15 percent slopes		Very limited
WaB	Watson gravelly silt loam, 2 to 8 percent slopes	Prime Farmland	Very limited
WaC	Watson gravelly silt loam, 8 to 15 percent slopes	Farmland of Statewide Importance	Very limited
WeB	Weikert shaly silt loam, 3 to 8 percent slopes	Farmland of Statewide Importance	Very limited
WeC	Weikert shaly silt loam, 8 to 15 percent slopes		Very limited
WeD	Weikert shaly silt loam, 15 to 25 percent slopes		Very limited

Source: United States Department of Agricultural, Natural Resources Conservation Service; RETTEW Associates

Hydrology

Due to the close relationship it plays in life and within the environment, water is a valuable and essential resource that must be understood and managed in order to protect the health, safety and general welfare of the community. Protecting water supplies by strategically directing growth and development to suitable areas, promoting safe use and disposal of pollutants such as fertilizers, industrial wastes, and sewerage effluent from septic systems, and minimizing excessive erosion, are crucial in municipal planning. By doing so, the community may provide a potable water supply that is free of water-related health and environmental risks. Recognizing potential flood areas, communities can also reduce the risks of damage to properties and development activities.

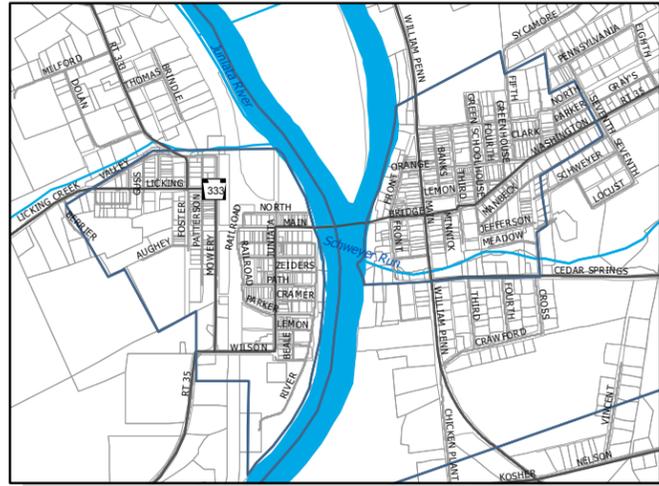


Though often overlooked, natural habitats for birds, fish and other animals also rely on water to sustain life. By understanding the basic components of hydrology, preserving this resource through community planning, and maintaining responsible community attitudes towards water, residents may confidently and safely use water and return it to the environment with minimal disruption to the general welfare of both human and wildlife communities within the county.

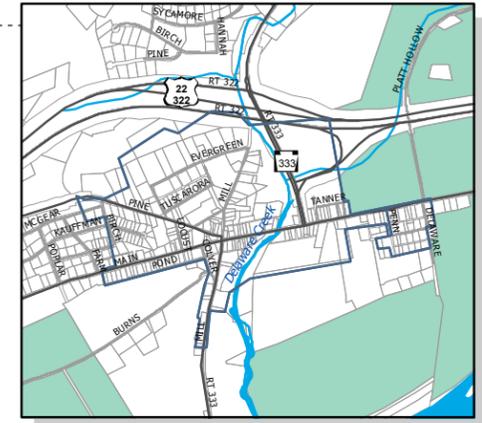
This portion of Chapter 2 will outline four basic components of the county’s hydrology. These components are surface water, ground water, floodplains, and wetlands. Hydrologic soils and watersheds are also discussed within these components. This section is intended to provide a general conceptual framework useful in establishing water management goals within the county.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-12*

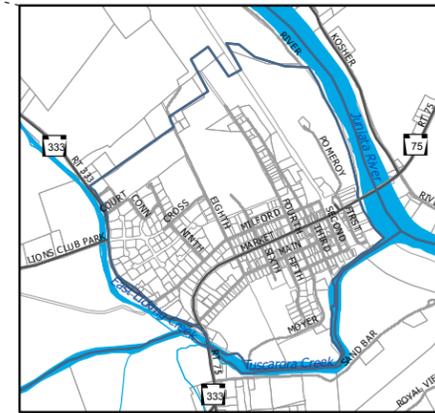
Juniata County Comprehensive Plan



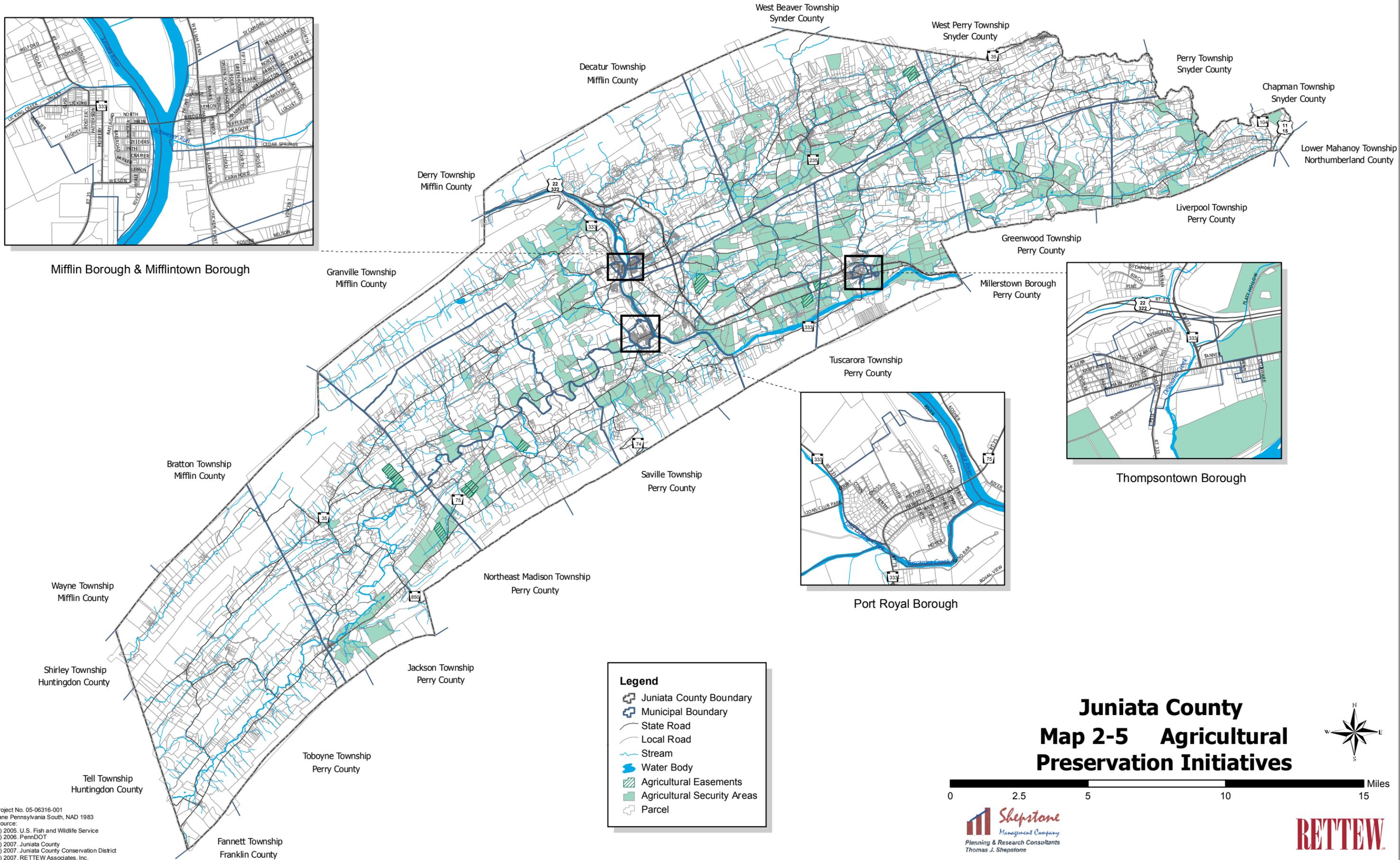
Mifflin Borough & Mifflintown Borough



Thompsontown Borough



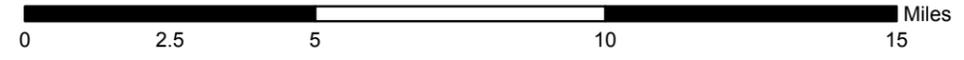
Port Royal Borough



Legend

- Juniata County Boundary
- Municipal Boundary
- State Road
- Local Road
- Stream
- Water Body
- Agricultural Easements
- Agricultural Security Areas
- Parcel

Juniata County Map 2-5 Agricultural Preservation Initiatives



Shepstone
Management Company
Planning & Research Consultants
Thomas J. Shepstone

RETTEW

RETTEW Project No. 05-06316-001
PA State Plane Pennsylvania South, NAD 1983
Base Map Source:
Copyright (c) 2005, U.S. Fish and Wildlife Service
Copyright (c) 2006, PennDOT
Copyright (c) 2007, Juniata County
Copyright (c) 2007, Juniata County Conservation District
Copyright (c) 2007, RETTEW Associates, Inc.

Surface Water



The primary influences to water runoff on the land are precipitation and seasonal variations in the weather. Periods of high runoff traditionally occur in the late winter and early spring, while periods of low runoff generally occur in late summer and early fall. As it interacts with the surface, water gradually carves its natural path into the surface, carrying soils and debris on its course. Over time, the topography is defined by this continuous interaction between water and earth.

For planning purposes, it is important that different water routes, streams and tributaries, as well as the drainage basins that feed these watercourses be delineated. Development activities of the various intensities that occur within a particular drainage basin can have a significant influence on the natural equilibrium of water infiltration and surface water movement. Stormwater from development, if carelessly directed, may force unnatural levels of water into gullies, streams, and creeks, causing excessive erosion to stream banks and abnormal levels of silt. Similarly, careless use and management of agricultural land uses can also have a damaging effect on the water quality of these surface drainage areas.

The following major stream water resources are found within Juniata County:

- Cocolamus Creek
- Juniata River
- Licking Creek
- Lost Creek
- Susquehanna River
- Tuscarora Creek
- West Branch Mahantango Creek

Major surface water features within Juniata County are displayed on **Map 2-6**.

Watersheds

A watershed is the entire land area drained by a particular watercourse. Land use activities and wastewater discharges within the watershed determine the quality of the water; which eventually flows out of the drainage area.

Juniata County Comprehensive Plan

The *Final Small Streams Regionalization Study for Juniata County, Pennsylvania* identifies the following major watersheds in Juniata County:

- Juniata River Valley – This watershed contains Mifflin, Mifflintown, Port Royal, and Thompsett Boroughs, and Delaware, Fermanagh, Milford, Turbett, and Walker Townships. It encompasses about 59,000 acres, or 24% of the county’s land area.
- Tuscarora Creek – The Tuscarora Creek watershed is Juniata County’s largest watershed as it includes 112,000 acres, or 45% of the county’s land area. The watershed is found within the Townships of Beale, Lack, Spruce Hill, and Tuscarora, and also a small portion of Port Royal Borough. The topography in the watershed is rough, marked by steep slopes and valleys. Licking Creek is a large contributor to the watershed, and is Tuscarora Creek’s largest tributary. Tuscarora Creek eventually feeds in the Juniata River.
- Lost Creek – Found in portions of Fayette and Fermanagh Townships, this watershed takes up about 26,000 acres, or 10% of the land area. This watershed is characterized as having gentle topography. Lost Creek empties into the Juniata River near the village of Cuba Mills.
- Cocolamus Creek – The Cocolamus Creek watershed is roughly 26,000 acres in size, or 12% of the county’s land area, and it encompasses portions of the Townships of Delaware, Fayette, Greenwood, and Monroe. Much of this watershed includes steep slopes. Cocolamus Creek empties into the Juniata River just south of the county.
- West Branch Mahantango Creek – This watershed encompasses Susquehanna Township and portions of Greenwood and Monroe Townships. It comprises of about 20,000 acres, or 8% of the county’s land area. The West Branch of the Mahantango Creek empties into the Susquehanna River, and much of its topography consists of steep slopes.

Within these major watersheds are many sub-basin watersheds. These watersheds are graphically shown on **Map 2-6**.

Protected Status of Waters

Chapter 93 of the Pennsylvania Code provides stream classifications which include Trout Stocking Fisheries (TSF), Cold Water Fisheries (CWF), Warm Water Fisheries (WWF), High Quality Waters (HQ), and Exceptional Value Waters (EV). Trout Stocking, Warm Water Fishery, and Cold Water Fishery classifications are based on maintenance or propagation of the fish species, or both, and the flora and fauna which are native to their habitat. The Special Protection Waters, High Quality and Exceptional Value classifications, are to be maintained and protected based on the chemical and biological water quality standards established for these classifications. High Quality and Exceptional Value waters are surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water. The difference between the two is Exceptional Value waters are to be protected at their existing water quality because they have outstanding recreational or ecological values. High Quality waters are also to be protected, but their water quality can be lowered if a discharge is a result of necessary social and economic development and all in-stream uses are protected. Exceptional Value classification mandates a higher level of protection since the High Quality classification provides for anti-degradation based upon specific criteria. Streams in Juniata County which carry a protected status are listed below in **Table 2-7**.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-14*

Juniata County Comprehensive Plan

Table 2-7: Protected Status of Streams in Juniata County

Stream	Zone	Water Uses Protected	
		Aquatic Life	Special Protection
West Branch Mahantango Creek	Main Stem, Source to Confluence with North Branch	Trout Stocking	
Unnamed Tributaries to West Branch Mahantango Creek	Main Stem, Source to Confluence with North Branch	Trout Stocking	
Quaker Run	Basin	Cold Water Fishes	
Leiningers Run	Basin	Cold Water Fishes	
Mahantango Creek (West)	Basin, Confluence of North and West Branches to mouth at Susquehanna River	Warm Water Fishes	
Roaring Run	Basin	Cold Water Fishes	
Macedonia Run	Basin	Cold Water Fishes	High Quality
Muddy Run	Basin	Cold Water Fishes	
Horning Run	Basin	Cold Water Fishes	
Lost Creek	Basin, Source to SR 35 Bridge at Oakland Mills	Cold Water Fishes	High Quality
Lost Creek	Basin, SR 35 Bridge to Little Lost Creek	Cold Water Fishes	
Little Lost Creek	Basin	Trout Stocking	
Lost Creek	Basin, Little Lost Creek to Big Run	Trout Stocking	
Big Run	Basin	Cold Water Fishes	
Lost Creek	Basin, Big Run to Mouth at Juniata River	Trout Stocking	
Schweyer Run	Basin	Cold Water Fishes	
Tuscarora Creek	Basin, Horse Valley Run to Willow Run	Cold Water Fishes	
Willow Run	Basin	Cold Water Fishes	High Quality
Tuscarora Creek	Basin, Willow Run to East Licking Creek*	Cold Water Fishes	
East Licking Creek*	Basin, Source to Clearview Reservoir Water Supply Intake	Cold Water Fishes	High Quality
East Licking Creek*	Basin, Clearview Reservoir Water Supply Intake to mouth at Tuscarora Creek	Cold Water Fishes	
Tuscarora Creek	Basin, East Licking Creek* to Mouth at Juniata River	Cold Water Fishes	
Doe Run	Basin	Trout Stocking	
Locust Run	Basin	Cold Water Fishes	
Delaware Creek	Basin	Trout Stocking	
Sugar Run	Basin	Cold Water Fishes	

* Major Branch of Licking Creek

Source: Drainage List, Chapter 93 of the Pennsylvania Code

Groundwater

One inch of rainfall over an acre of ground equals 27,000 gallons of water. The topography and physical features of the land determine drainage patterns and surface flow characteristics. Steep slopes cause increased runoff and erosion, and discourage infiltration to the water table. Groundwater flow directions are controlled in part by topography, but mainly by the sub-surface ground characteristics of the earth, such as rock formation, soil type, etc. **Table 2-1** analyzes groundwater quality with each geologic formation found within the county.

Additional information and strategies for the protection of groundwater resources is discussed later in this chapter.

Floodplains

Adequate floodplain management is crucial to municipalities that have extensive floodplain areas. Preserving floodplain areas from development disturbances is crucial toward minimizing potential damages to property and risk of injury due to extensive flooding. Allowing the floodplain areas to remain in their natural state will also minimize any major changes to the balance of the hydrologic system. The unplanned encroachment of structures and land filling activities in floodplain areas has the potential of reducing the floodplain land area and water carrying capacity; thus, increasing water heights, velocities, and flood hazards in areas beyond those encroachments.

Floodplains in Juniata County are graphically shown on **Map 2-6**.

Wetlands

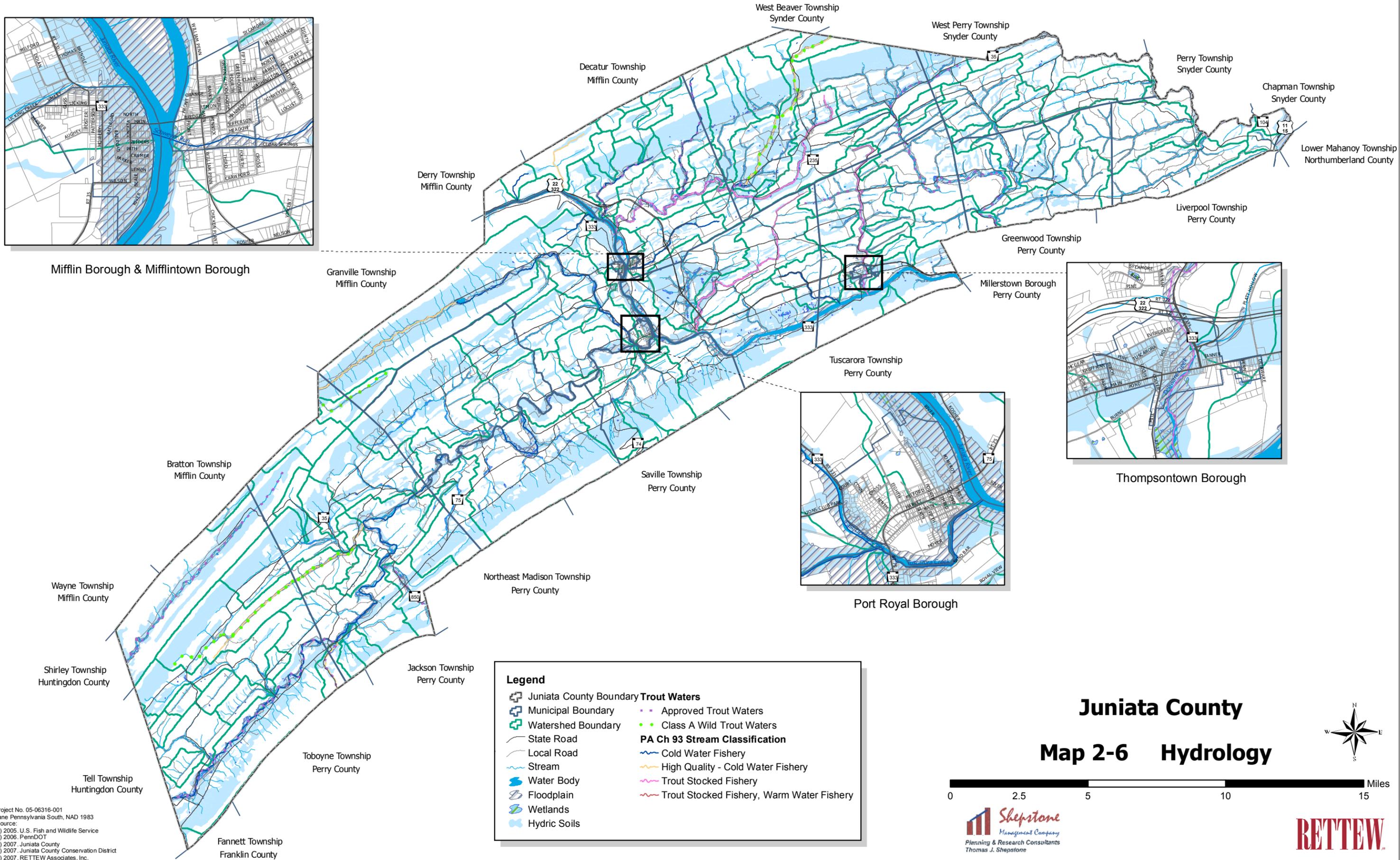
In addition to surface streams, groundwater resources, and floodplains, another important component in the county hydrology is wetlands. Over the past decade, the Nation and Pennsylvania have recognized wetlands as a valuable natural resource. This national recognition has led to the documenting of the importance of this resource, increasing public and private awareness and participation in wetland programs, and moving wetland concerns to the forefront of environmental issues.

In general, the Federal Manual for Identifying and Delineating Jurisdictional Wetlands outlines the criteria used to determine whether three (3) basic wetland conditions exist. These conditions are:

- The presence of wetland vegetation – These plants are called hydrophytic plants and are adapted to life in saturated soil conditions.
- The area hydrology (saturated soils) – Wetland hydrology is the presence of water at or near the surface at some time during the growing season.
- Identification of hydric soils – Hydric soils are soils characterized by their wetness. The federal delineation manual classifies soils as hydric if they meet the criteria set by the National Technical Committee for Hydric Soils. Other manuals used to identify jurisdictional wetlands include U.S.A.C.O.E. 87 Manual and the NRCS.

Wetlands are classified as two types: tidal (coastal wetlands) and nontidal (inland/palustrine). The wetlands found in Juniata County are nontidal, and may include freshwater marshes and ponds, shrub swamps, wooded swamps, and areas along the creeks and streams. The three common types of wetlands are: (1) emergent, (2) scrub-shrub, and (3) forested. Emergent wetlands are characterized by non-woody vegetation less than 20 feet tall. Scrub-Shrub contains smaller ground plants, while forested wetlands are those dominated by trees (20 feet or higher). These various classifications and characteristics are outlined and identified on the National Wetland Inventory mapping prepared by the U.S. Fish and Wildlife Service. However, for the purposes of this report, the various coding has not been included.

Juniata County Comprehensive Plan



RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005, U.S. Fish and Wildlife Service
 Copyright (c) 2006, PennDOT
 Copyright (c) 2007, Juniata County
 Copyright (c) 2007, Juniata County Conservation District
 Copyright (c) 2007, RETTEW Associates, Inc.



Juniata County Comprehensive Plan

Wetlands in the state are important for a number of reasons. They provide habitats for most threatened and endangered species. Wetlands provide food for game fish and other animals, as well as nesting birds. They function to reduce flooding by absorbing additional water and slowing the pace of water to neighboring creeks and streams. Wetlands also act to buffer creeks and streams from excessive erosion and sedimentation.

Wetlands, as identified on the National Wetland Inventory Map, in Juniata County are graphically shown on **Map 2-6**.

Juniata County Natural Heritage Inventory - 2007

A county natural heritage inventory, also known as a natural areas inventory, is designed to identify and map areas that support species of special concern, exemplary natural communities, and broad expanses of intact natural ecosystems that support important components of Pennsylvania's native species biodiversity. Its purpose is to provide information to help municipal, county, and state governments, private individuals, and business interests plan development with the preservation of an ecologically healthy landscape with future generations in mind. This was a three county approach involving Juniata, Mifflin, and Snyder Counties. The full study can be reviewed at http://www.jcwp.org/county_natural_heritage_inventor.htm

Natural Heritage Inventory Classification

To provide the information necessary to plan for conservation of biodiversity at the species, community, and ecosystem levels, natural heritage sites were designated in the county and ranked for their ecological significance. These sites, as well as areas identified from the Important Mammal Area and Important Bird Area Projects, are mapped and described in this report. A natural heritage site is an area containing plants or animals of special concern at state or federal levels, exemplary natural communities, or exceptional native diversity. Sites are mapped to include both the immediate habitat and surrounding lands that are important in the support of these special elements. Sites are mapped according to their sensitivity to human activities. Core habitat areas delineate essential habitat that cannot absorb significant levels of activity without substantial impact to the elements of concern. The supporting natural landscape includes areas that maintain vital ecological processes or secondary habitat that may be able to accommodate some types of low-impact activities.

Methods

Fifty-four of sixty-seven county inventories have been completed in Pennsylvania to date. The Juniata County Natural Heritage Inventory followed the same methodologies as previous inventories, which proceeded in the following stages:

Juniata County Comprehensive Plan

Information Gathering

A review of various databases determined where locations for special concern species and important natural communities were known to exist in Juniata County. Knowledgeable individuals were consulted concerning the occurrence of rare plants and unique natural communities in the county. Geological maps, United States Geological Survey (USGS) topographical maps, National Wetlands Inventory maps, United States Department of Agriculture (USDA) soil surveys, recent aerial photos, and published materials were also used to identify areas of potential ecological significance. Once preliminary site selection was completed, reconnaissance flights over chosen areas of the county were conducted.

Field Work

Areas identified as potential inventory sites were scheduled for ground surveys. After obtaining permission from landowners, sites were examined to evaluate the condition and quality of the habitat and to classify the communities present. The flora, fauna, level of disturbance, approximate age of community, and local threats were among the most important data recorded for each site. Sites were not ground surveyed in cases where permission to visit a site was not granted, when enough information was available from other sources, or when time did not permit.

Data Analysis

Data obtained during the 2004 through 2006 field seasons was combined with prior existing data and summarized. All sites with species or communities of statewide concern, as well as exceptional examples of more common natural communities were mapped and described. Spatial data on the elements of concern were then compiled in a geographic information system (GIS) format using ESRI ArcGIS 9 software. The boundaries defining each site were based on physical and ecological factors, and specifications for species protection provided by government jurisdictional agencies. The sites were then assigned a significance rank based on size, condition, rarity of the unique feature, and quality of the surrounding landscape.

Results

Fifty-nine sites of ecological significance are recognized in the Juniata County Natural Heritage Inventory, including important geologic and ecological features in the county. Spatial distribution of Natural Heritage sites across the county is graphically shown on **Map 2-7**.

Conservation Recommendations

Juniata County has a number of groups pursuing the protection of natural areas within the county. The following are general recommendations for protecting the biological diversity of Juniata County.

- Consider conservation initiatives for natural areas on private land.
- Prepare management plans that address species of special concern and natural communities.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-18*

Juniata County Comprehensive Plan

- Protect bodies of water.
- Provide for buffers around natural areas.
- Reduce fragmentation of surrounding landscapes.
- Encourage the formation of grassroots organizations.
- Manage for control of invasive species.
- Promote community education.
- Incorporate county Natural Heritage Inventory information into planning efforts.

Discussion and Recommendations

Planning for Biodiversity and Ecological Health

Provision for the future health of ecological resources in Juniata County will require action on many fronts. Special consideration should be given to steward specific sites that host unique species and communities, broader scale planning to maintain the unique contiguity of its forested regions, and restoration efforts to alleviate water pollution and restore ecological function to damaged landscapes and waterways.

Forest Communities

In the forested landscapes, objectives for large-scale planning should include maintaining and increasing contiguity and connectivity of natural land. Contiguity is important for the enhanced habitat values outlined above; however, for many species, it is equally critical that natural corridors are maintained that connect forests, wetlands, and waterways. For example, many amphibians and dragonflies use an aquatic or wetland habitat in one phase of their life then migrate to an upland or forested habitat for their adult life. Either habitat alone cannot be utilized unless a corridor exists between them. Municipal and regional land use plans can support maintenance of forest connectedness by encouraging residential or commercial projects to redevelop in existing town centers or reuse previously altered landscapes, rather than creating new infrastructure through unfragmented natural landscapes.

Wetland/Aquatic Communities

Juniata County's waterways, ranging from headwater mountain streams to the Juniata River, include some of Pennsylvania's most scenic features. Objectives for large-scale planning should include restoration of water quality in the county's waterways through a reduction in the release of pollutants into runoff, including sediments, nutrients, and chemical contaminants. Stewardship or restoration of native forest communities in riparian buffers along waterways will greatly improve water quality and enhance the habitat value for various aquatic and semi-aquatic species. Attending to the basic ecological functions of streams and wetlands will increase human welfare by ensuring the continued availability of quality water for human communities, enabling the restoration of healthy fisheries, and enhancing the quality of life for which the region is known.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-19*

Evaluating Proposed Activity within Natural Heritage Sites

A very important part of encouraging conservation of the Natural Heritage sites identified within the Juniata County Natural Heritage Inventory is the careful review of proposed land use changes or development activities that overlap with Natural Heritage sites. The following overview should provide guidance in the review of these projects or activities.

- Always contact the Juniata County Planning Commission. The county planning commission should be aware of all activities that may occur within Natural Heritage sites in the county so that they may interact with the Juniata County Conservation District and other necessary organizations or agencies to better understand the implications of proposed activities. They can also provide guidance to the landowners, developers, or project managers as to possible conflicts and courses of action.
- Applicants for building permits and planning commissions should conduct free, online, environmental reviews to become informed project-specific potential conflicts with sensitive natural resources. Environmental reviews can be conducted by visiting the Pennsylvania Natural Heritage Program’s website, at <http://www.naturalheritage.state.pa.us/>. If conflicts are noted during the environmental review process, the applicant is informed of the steps to take to minimize negative effects on the county’s sensitive natural resources. Depending upon the resources contained within the Natural Heritage Area, the agencies/entities responsible for the resource will then be contacted. The points of contact and arrangements for that contact will be determined on a case-by-case basis by the county and PNHP. In general, the responsibility for reviewing natural resources is partitioned among agencies in the following manner:
 - *U.S. Fish and Wildlife Service* for all federally listed plants and animals.
 - *Pennsylvania Game Commission* for all state and federally listed terrestrial vertebrate animals.
 - *Pennsylvania Fish and Boat Commission* for all state and federally listed reptiles, amphibians, and aquatic vertebrate and invertebrate animals.
 - *Pennsylvania Bureau of Forestry* for all state and federally listed plants.
 - *Pennsylvania Department of Conservation and Natural Resources (DCNR)* for all natural communities, terrestrial invertebrates, and species not falling under the above jurisdictions. PNHP and agency biologists can provide more detailed information with regard to the location of natural resources of concern in a project area, the needs of the particular resources in question, and the potential impacts of the project on those resources.
- Plan ahead. If a ground survey is necessary to determine whether significant natural resources are present in the area of the project, the agency biologist reviewing the project will recommend a survey be conducted. Pennsylvania Natural Heritage Program (PNHP), through the Western Pennsylvania Conservancy, or other knowledgeable contractors can be retained for this purpose. Early consideration of natural resource impacts is recommended to allow sufficient time for thorough evaluation. Given that some species are only observable or identifiable during certain phases of their life cycle (i.e., the flowering season of a plant or

Juniata County Comprehensive Plan

the flight period of a butterfly), a survey may need to be scheduled for a particular time of year.

- Work to minimize environmental degradation - If the decision is made to move forward with a project in a sensitive area, PNHP can work with municipal officials and project personnel during the design process to develop strategies for minimizing the project's ecological impact while meeting the project's objectives. The resource agencies in the state may do likewise. Finally, consultation with PNHP or another agency does not take the place of a state environmental review. However, early consultation and planning as detailed above can provide for a more efficient and better integrated permit review, and a better understanding among the involved parties as to the scope of any needed project modifications.

Using the Natural Heritage Inventory in Juniata County

The following are specific recommendations that will serve to incorporate this information into planning and land conservation activities in Juniata County.

- Work to incorporate the Juniata County Natural Heritage Inventory into the implementation of the comprehensive plan and to use the NHI to guide future planning, subdivision review, acquisition, development, and conservation initiatives.
- Incorporate the NHI into the joint Mifflin/Juniata Greenway and Open Space Network Plan, in progress.
- Apply the results to county land use planning by incorporating the NHI core sites into parameters used for designating the Natural Resource Protection Area and the Rural Development Area. Also work to incorporate steep slopes, floodplains, wetlands, and public lands into the comprehensive planning process. Some of the Natural Heritage sites, such as pastoral features, can be compatible with rural land uses, given that appropriate management practices are encouraged, and could be incorporated into the Rural Development Area. Other sites would be more consistent with the Natural Resource Protection Areas.
- Make the NHI report available to all municipalities in the county. Copies of the final report were provided to each municipality. GIS layers resulting from the NHI will be available from the Juniata County Planning Department.
- Provide the NHI report to local watershed organizations, such as the Juniata Clean Water Partnership, and conservation organizations, such as the Central Pennsylvania Conservancy, for prioritizing conservation actions.
- Update the Juniata NHI after a period of 10 years or 2 years prior to any planned review of the Juniata County Comprehensive Plan.

Juniata County's Forests

The forests of Juniata County are an asset that must be properly managed. Management of state owned forest land comes under the purview of the Bureau of Forestry and the District Forester. The state forest system was first established in 1898 for the purpose of providing a continuous supply of wood products, protecting watersheds, and providing opportunities for outdoor recreation. Over the last century, these lands, and additional lands that have been acquired, have been carefully managed by the Bureau of Forestry. Today, the state forest comprises over 2.1 million acres and accounts for 12 percent of the forested area in the commonwealth. Pennsylvania's state forest represents one of the largest expanses of public forest land in the eastern United States, making it a truly priceless public asset.

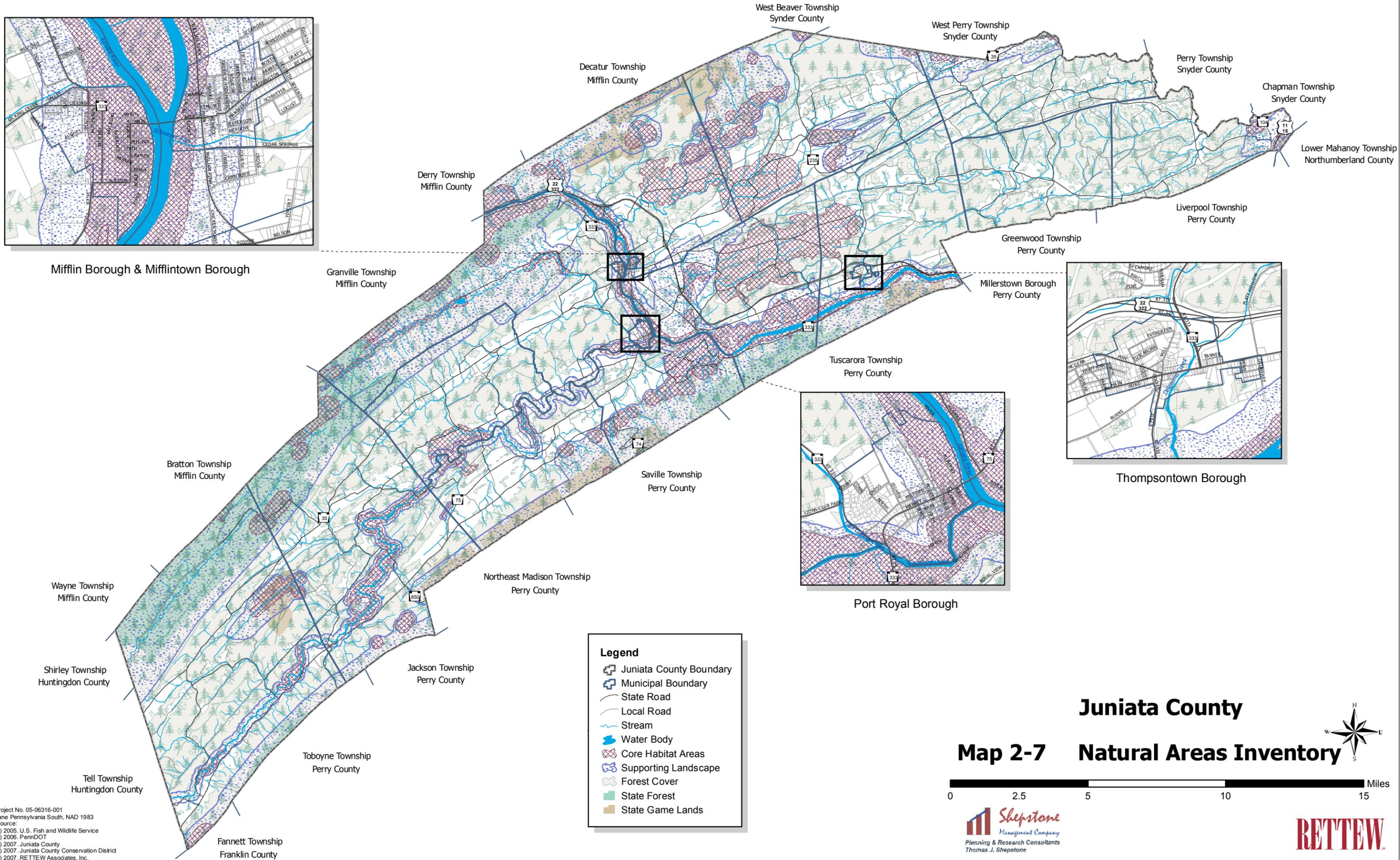
The state forest provides many benefits to the citizens of Pennsylvania. The harvest of quality hardwood timber helps support the state's \$5 billion forest products industry that employs almost 100,000 people. These same forests provide habitat for a wide array of flora and fauna, including many rare, threatened, and endangered species. They also protect watersheds, which provide some of the cleanest water found in the commonwealth for drinking and recreational opportunities. Our forests provide all this while facing dramatic increases in recreational activities that have become vital to Pennsylvania's tourism industry.

With increasing pressures on the state forest, the Bureau of Forestry initiated a strategic planning effort to address the issue of long-term sustainability. In 1995, this effort resulted in the Bureau's strategic plan, "Penn's Woods - Sustaining Our Forests". The foundation of the strategic plan was a commitment to manage the state forest using the principles of ecosystem management. Several years later, the management of the state forest underwent an independent third-party review conducted by Scientific Certification Systems (SCS), based on the forest management principles established by the Forest Stewardship Council (FSC). In 1998, this review resulted in an extensive report and the "certification" that the state forest was "well managed." At that time, the Pennsylvania State Forest was the largest forest in North America to receive this designation. Private individuals own 82% of the forest lands in the state. These private individuals must act as stewards of the land and should employ the same goals as adopted by the state in managing private forest resources.

The county's forests are a vital resource to sustaining Juniata County's economy and environment. However, timbering, especially clear-cutting, can have an adverse impact on groundwater supplies and water resources for the county's public water systems. This plan recognizes that timbering is a legitimate use and contributes to the county's economy; however, the plan recommends that the Juniata County Planning Commission assist local municipalities in developing a timber harvesting ordinance for review, consideration, and possible adoption by the local municipality. Priority municipalities include all those that contain watersheds that feed public water systems. Best Management Practices (BMPs) should be implemented in addition to the standard erosion and sedimentation control measures that are required.

0

Juniata County Comprehensive Plan



RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005, U.S. Fish and Wildlife Service
 Copyright (c) 2006, PennDOT
 Copyright (c) 2007, Juniata County
 Copyright (c) 2007, Juniata County Conservation District
 Copyright (c) 2007, RETTEW Associates, Inc.



Juniata County Comprehensive Plan

The *Penn State Timber Market Report* contains the following statistics on forestry in Juniata County:

- Juniata County contains 250,880 acres of land. Forest covers 165,700 acres or 66% of Juniata County.
- There are 6,122 private forest land owners in the county.
- The county contains 37 forestry and wood products establishments.
- The forestry and wood products industry provides jobs for 866 employees in the county.
- The annual economic contribution of the forestry sector is \$5.7 million dollars.
- The annual economic contribution of the wood product and paper sector is \$25.6 million dollars.

Tuscarora State Forest

A portion of the Tuscarora State Forest is located in Juniata County. Not only does the forest provide a continuous supply of wood products and watershed protection, it is also a major attraction for outdoor enthusiasts. The recreation benefits of the state forest will be discussed in detail in the Juniata/Mifflin Counties Open Space, Recreation, and Greenway Plan.

Map 2-8 graphically shows the location of the major forested areas of the county and the location of the Tuscarora State Forest.



The Pennsylvania Rivers Conservation Program, Juniata Watershed Management Plan – September 2000

This watershed plan completes a crucial planning phase for the Juniata River watershed and for the Juniata Clean Water Partnership program, and the completed plan will serve as a catalyst for watershed restoration and protection projects that will provide watershed residents with a clean and healthy future.

The Juniata River watershed encompasses 12 counties and 200 municipalities, including 17 municipalities in Juniata County: Mifflin, Mifflintown, Port Royal, and Thompsettown Boroughs, and Beale, Delaware, Fayette, Fermanagh, Greenwood, Lack, Milford, Monroe, Spruce Hill, Susquehanna, Turbett, Tuscarora, and Walker Townships. With respect to the watershed, Juniata County contains two outstanding and unique scenic features, Hawstone Overlook and Concord Narrows.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-23*

Juniata County Comprehensive Plan

Hawstone Overlook is located in Milford Township and is located on PA Route 333, east of Hawstone Village. This overlook provides an excellent view of the Lewistown Narrows and the Juniata River between Blue Mountain and Shade Mountain.

Concord Narrow is a water gap through the Tuscarora Mountain and is located at the intersection of Juniata, Huntington, and Franklin Counties on PA Route 75. The gap is narrow and scenic with Tuscarora quartzite of Silurian Age.

Two Juniata County agencies, the Juniata County Conservation District and the Juniata County Planning Commission, partnered with Juniata Clean Water Partnership to develop the plan.

The overview of the plan is structured into two major sections, resource chapters and recommended actions. Resource chapters include a general description of the watershed, and the land, water, biological, and cultural resources of the watershed. The other major section includes chapters on recommended actions and projects that will address the concerns of the watershed.

The plan, under the recommended actions section, prioritizes issues and sets a timetable in which these issues should be addressed. Some of the top issues presented in this section include land use planning, stormwater management, water monitoring, erosion and sedimentation/non-point source pollution, forestry, large scale/intensive livestock operations, funding, and government coordination.

Under the implementation strategy heading there is a recommended action for Juniata County to complete or update county comprehensive plans to provide a model for municipalities.

Environmental Limitations

Upon review of the various individual elements of the natural environment identified in this chapter, selected overlays were reviewed in conjunction with each other. A Geographic Information System was used to generate various map overlays. Elements of the environment that were examined as part of this analysis include:

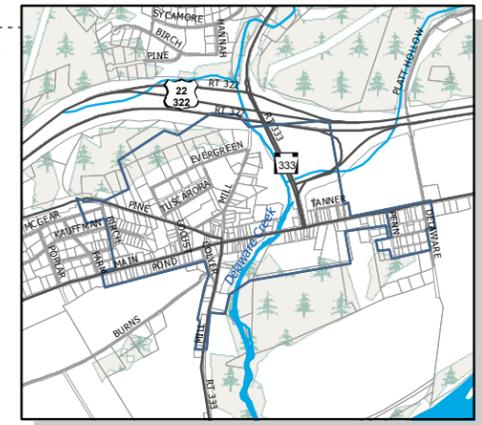
- Waterbodies and stream corridors
- Floodplains
- Wetlands
- Cautionary and steep slopes
- Woodlands

These items are considered environmental limitations that may pose additional constraints to development. The geographic locations of these features are shown on **Map 2-9**.

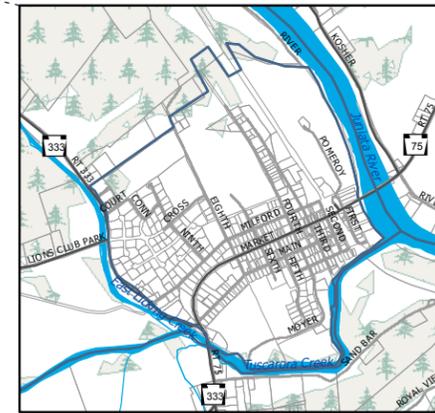
Juniata County Comprehensive Plan



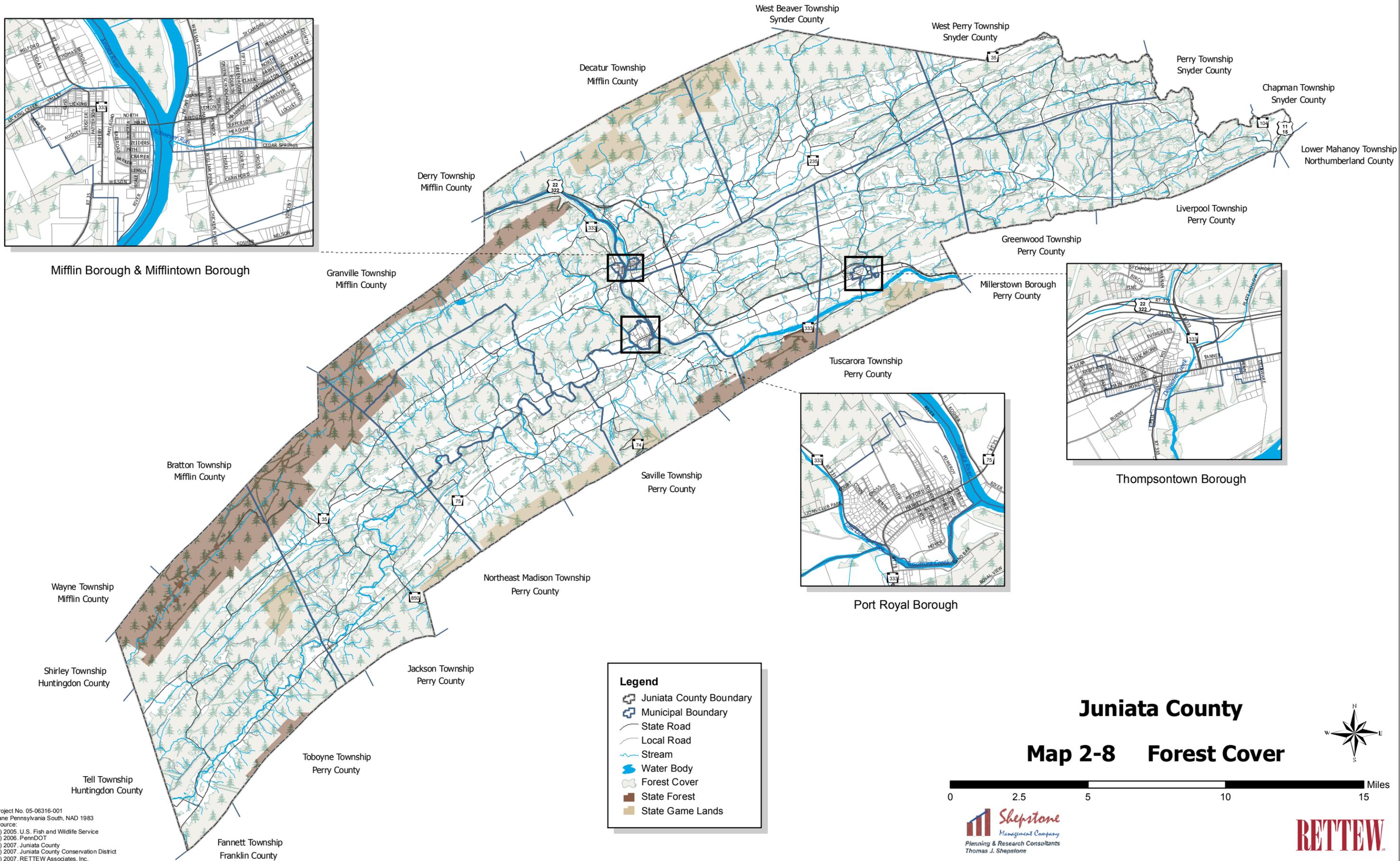
Mifflin Borough & Mifflintown Borough



Thompsontown Borough



Port Royal Borough

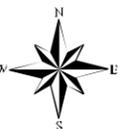


Legend

- Juniata County Boundary
- Municipal Boundary
- State Road
- Local Road
- Stream
- Water Body
- Forest Cover
- State Forest
- State Game Lands

Juniata County

Map 2-8 Forest Cover



RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005, U.S. Fish and Wildlife Service
 Copyright (c) 2006, PennDOT
 Copyright (c) 2007, Juniata County
 Copyright (c) 2007, Juniata County Conservation District
 Copyright (c) 2007, RETTEW Associates, Inc.

Conservation Overlay

In order to protect the most sensitive natural resources in the county, a conservation overlay has been developed and incorporated into the future land use plan. It accounts for floodplains, wetlands, stream corridor protection, and areas of steep slope. Because the conservation classification has been developed as an overlay, it indicates areas of unique natural features that mandate attention and may require more stringent regulations. For example, areas along the Tuscarora Creek stream corridor may require additional protection and may not be able to be developed in the same manner as areas of the county which are located further from these sensitive areas.

Overlay districts are often applied to municipal ordinances that regulate land use and development as a way to protect environmental features, and impose additional regulations or restrictions on the development and use of the land. This plan recommends that Juniata County assist local municipalities in incorporating the conservation overlay in the future land use plan into their local zoning ordinances to ensure protection of the county's natural resources.

The conservation overlay was developed with information shown in **Map 2-9**, Environmental Constraints. Prime agricultural soils and farmland of statewide importance are also shown on this map, but the agricultural soils are not considered to be part of the conservation overlay. Those features included in the conservation overlay are described in this section.

Slope Protection

The areas of steepest slope, those slopes greater than 25%, are found along the mountain ridges in the county. There are also areas of cautionary slope, those 15% to 25%, that are located throughout the county. The comprehensive plan recognizes steep slopes and hillsides as unique areas which are fragile and susceptible to erosion, landslides, mudslides, and degradation of their natural vegetation. Conventional development practices often increase these threats. By protecting this asset, the county intends to:

- Guide development away from steep slopes
- Minimize grading and other site preparation in steep areas
- Provide a safe means for ingress and egress while minimizing scaring from hillside construction
- Preserve natural conditions in steep areas
- Prevent flooding and the deteriorating effects of erosion to streams and drainage areas.

It is recommended that areas of prohibitive slopes, those slopes 25% and greater, and cautionary slopes, those slopes 15% to 25%, be subject to regulations that will control the intensity of development that can occur in these sensitive areas. Prohibitive slopes and cautionary slopes are included in the conservation overlay, shown in **Map 2-9**. Their specific locations are shown in **Map 2-1**.

Stream and Surface Water Protection

The comprehensive plan identifies and recognizes streams and the natural areas around them as important hydrological assets that support sensitive ecological habitats. It is the intent of this plan to preserve natural and man-made waterways. By encouraging the protection of this asset, Juniata County intends to promote the:

- Protection of wildlife
- Reduction of human exposure to high water and flood hazards
- Preservation of existing vegetation along waterways, lakes, and ponds
- Minimization of the negative effects on waterways from agriculture and development related runoff and erosion
- Minimization of scenic degradation
- Protection of water quality by reducing stormwater runoff
- Protection of the integrity of ponds and lakes as functioning wetland habitat areas

Stream protection has been included in the conservation overlay by applying a 50 foot buffer to all of the streams and watercourses in the county, as shown in **Map 5-3**. Additional water resources protection tools are described later in this chapter.

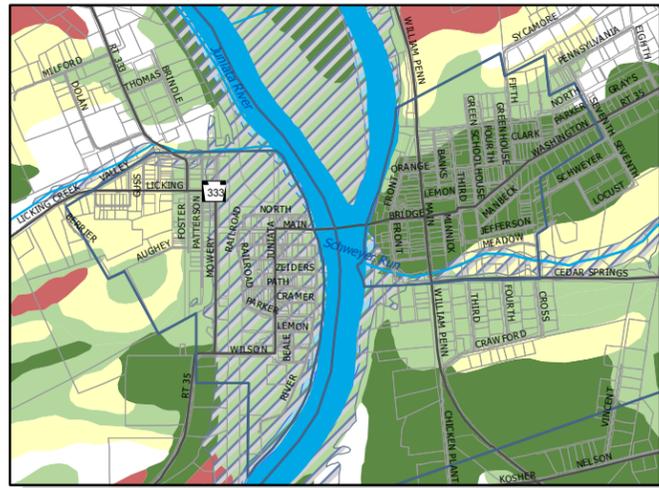
Wetland Protection

Wetlands are unique places that have several socioeconomic, environmental quality, and wildlife values associated with them. As such, the comprehensive plan recognizes that wetlands are a sensitive hydrologic natural resource that should be preserved. Damaging or destroying wetlands threatens public safety and the general welfare. Because of their importance, wetlands are to be protected from negative impacts of development and other activities. It is the intent of this plan to:

- Require planning to avoid and minimize damage of wetlands whenever prudent or feasible
- Require that activities not dependent upon wetlands be located on other sites
- Allow wetland losses only where all practical or legal measures have been applied to reduce these losses that are unavoidable and in the public interest.

There are not many areas of wetlands that have been delineated in the county, but individual site investigations may result in additional designated areas. Wetlands are included in the conservation overlay, as shown in **Map 5-3**. The specific location of wetlands is shown on **Map 2-9**, Environmental Constraints, and **Map 2-6**, Hydrology.

Juniata County Comprehensive Plan



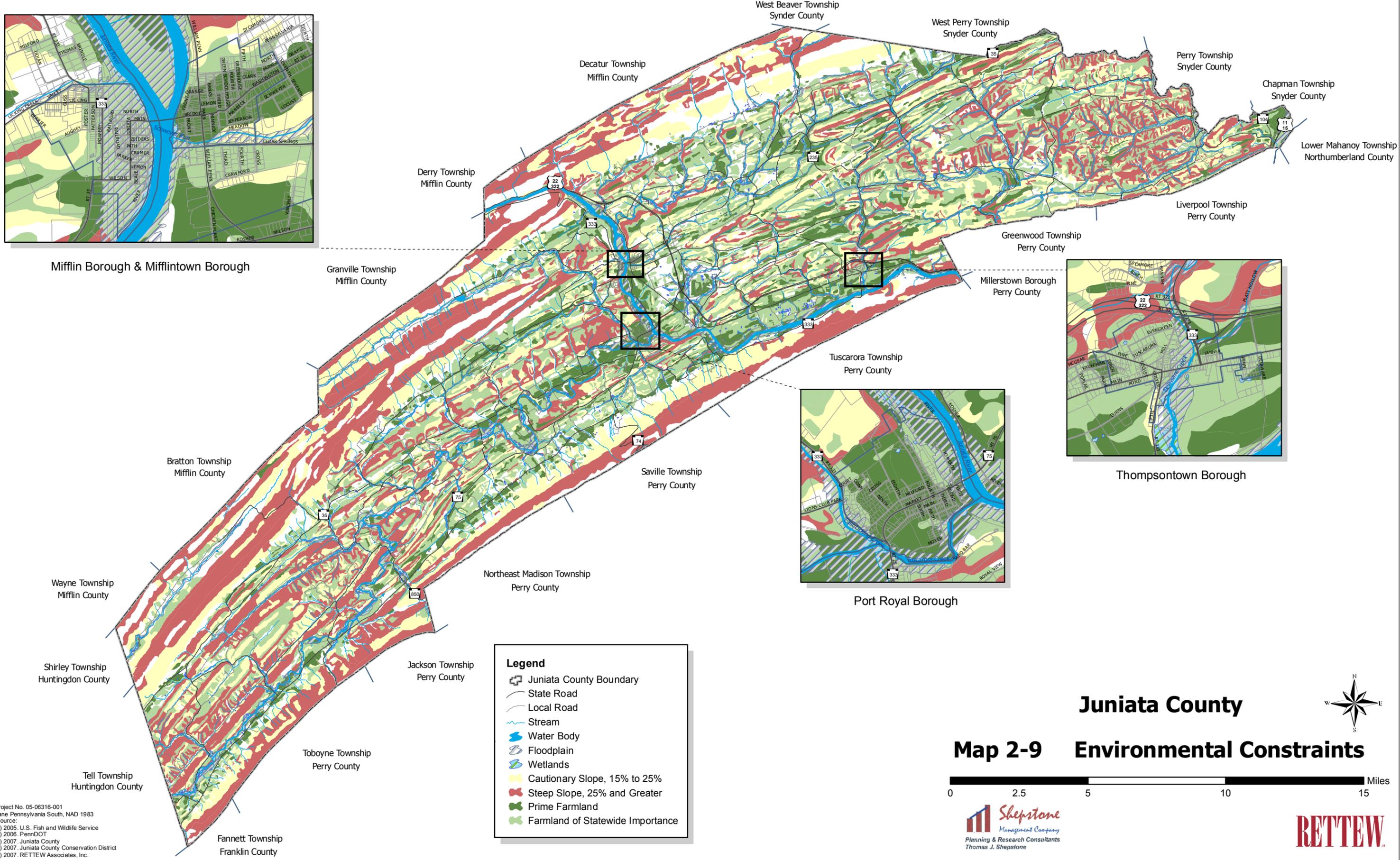
Mifflin Borough & Mifflintown Borough



Thompsontown Borough



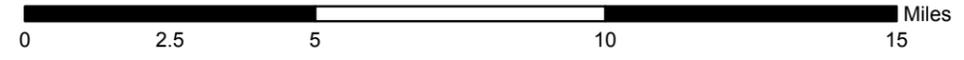
Port Royal Borough



Legend

- Juniata County Boundary
- State Road
- Local Road
- Stream
- Water Body
- Floodplain
- Wetlands
- Cautionary Slope, 15% to 25%
- Steep Slope, 25% and Greater
- Prime Farmland
- Farmland of Statewide Importance

Juniata County Map 2-9 Environmental Constraints



RETTEW Project No. 05-06316-001
 PA State Plane Pennsylvania South, NAD 1983
 Base Map Source:
 Copyright (c) 2005, U.S. Fish and Wildlife Service
 Copyright (c) 2006, PennDOT
 Copyright (c) 2007, Juniata County
 Copyright (c) 2007, Juniata County Conservation District
 Copyright (c) 2007, RETTEW Associates, Inc.

Floodplain Protection

Preserving floodplain areas from development is crucial in minimizing potential damages to property and the risk of injury caused by flooding. Allowing floodplain areas to remain in their natural state will also minimize any major changes to the balance of the hydrologic system and allow for groundwater recharge. Areas identified in the 100-year floodplain have been included in the conservation overlay. Juniata County should encourage and assist municipalities with developing and including a floodplain management overlay district in the zoning ordinance.

Development Styles that Support the Conservation of Natural Features

The future land use plan identifies several strategies, or tools, that the county should encourage local municipalities to consider during implementation. This section looks more specifically conservation by design, due to its direct relationship with natural resources and open space preservation.

Conservation by Design / Open Space Development

- **Description**

- Conservation by design, or open space development, is an enhanced variation of the cluster zoning technique in which a higher percentage of the site is dedicated to open space. The purpose of this advanced technique is to preserve a larger amount of land for conservation uses, while still allowing full-density development. In contrast to cluster development, where the emphasis is more often placed on providing active recreational areas, open space zoning is better suited for protecting farmland, woodland habitat, historic sites, and scenic views. Under this technique, developers of a subdivision are required to dedicate a significant portion of their unconstrained land to permanent open space uses. Housing is designed to compliment the aesthetic views of the preserved land and streets are designed to access the residential community in a manner that minimizes disturbance of natural areas.

- **How it Works**

- Conservation subdivisions can be formalized within an ordinance. One of the more popular methods is a four step process that first identifies primary and secondary conservation areas, then designs open space to protect them, next arranges houses outside of those protected areas, and finally lays out streets, lots, and infrastructure.
- Open space regulations can also be implemented through a zoning ordinance. The number of dwellings permitted is based on the net acreage of buildable land and the underlying density in the zoning district. Easements are then placed on the open space to ensure that it will not be further subdivided or developed.
- Conservation by design is fully supported by the Natural Lands Trust, and is detailed in the Pennsylvania Department of Conservation and Natural Resources publication,

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-27*

Juniata County Comprehensive Plan

Growing Greener – A Conservation Planning Workbook for Municipal Officials in Pennsylvania.

- **Pros and Cons**

- Benefits of development through conservation by design include:
 - Open space design achieves a community goal of preserving open space at the same density standard.
 - None of the land is taken for public use unless the developer/owners want it to be.
 - There are a variety of ownership choices.
 - If implemented under a plan and with conservation as the motivation, potential benefits lie in things that are not included or required as a result of the plan. For example, the design does not require public expenditure of funds, depend on landowner charity, involve complicated regulations for shifting rights to other parcels, or depend on the cooperation of two or more adjoining land owners to make it work.
- Conservation by design does not work in all areas or for all communities. Negative aspects that should be considered include:
 - Conservation by design should take place with a planning framework and conservation goals in place.
 - These subdivisions should connect to a broader network of conservation areas to prevent a “chopped up” landscape.
 - Conservation subdivisions that are not attached to already developed areas and are not connected to services may result in poor land use practices.
 - Conservation subdivisions do not always decrease the need for the automobile and may not provide affordable housing.

Water Resources Protection Toolbox

An understanding of water resources is critical to achieve balance among human, economic, and environmental needs. The most significant challenge for preserving future water resource goals is growth patterns and activities on land. Protecting water supplies by strategically directing growth and development to suitable areas; promoting safe use and disposal of pollutants, such as fertilizers, industrial wastes, sewerage effluent from septic systems; and minimizing excessive erosion, is crucial in county, regional, and municipal planning.

This section presents a series of tools that the county should promote as it moves forward with implementing the plan. Not all of these tools will be applicable to the current water resources situation in the county, but these tools are meant to assist the county and local municipalities with understanding the resources that are available to them. These tools include:

- Critical Aquifer Recharge Area Identification
- Water Budget and Groundwater Availability Analysis

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-28*

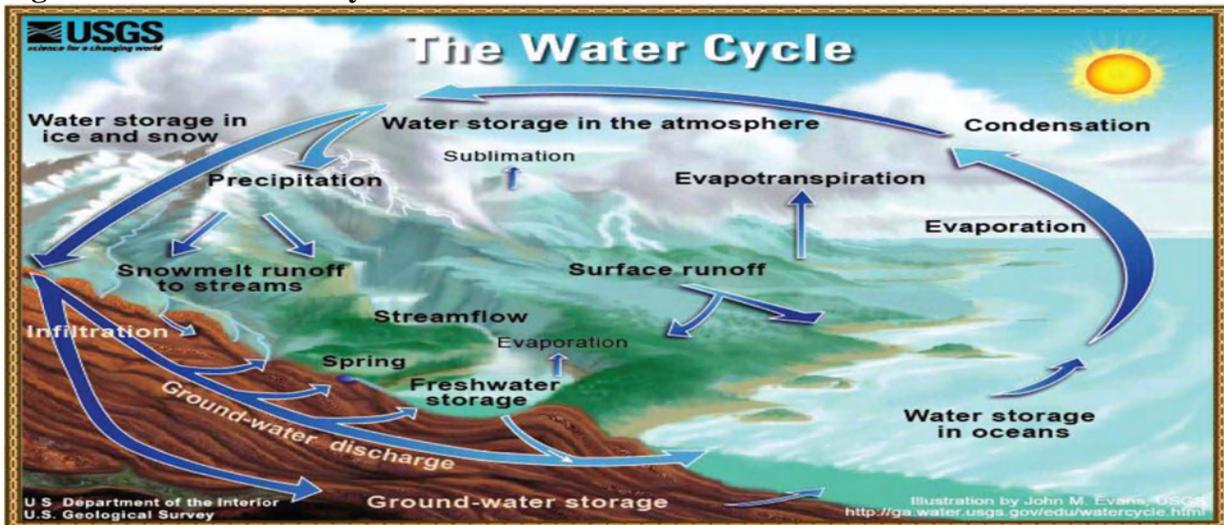
- Wellhead Protection
- Well Drilling Techniques
- Groundwater Management Plans
- Water Supply Plans
- Stormwater Management Plans
- Integrated Water Resources Plan
- Water Conservation Plan

The tools and strategies identified in this water resource plan are generally consistent with the State Water Plan and the Susquehanna River Basin Commission. It also recognizes that lawful activities such as extraction of minerals may impact water supply sources and such activities are governed by statutes regarding extraction that specify replacement and restoration of water supplies affected by such activities, and that commercial agriculture production may impact water supply sources.

The Hydrologic Cycle

The occurrence and interrelationship of water from and to the atmosphere, on the land surface, and in the ground is known as the hydrologic cycle, shown in **Figure 2-1**. Understanding the pathways and impact from human activities is fundamental to proper management of water resources. Surface waters consist of perennial and intermittent streams, lakes, reservoirs, ponds, wetlands, springs, and natural seeps. Groundwater is water contained in the soils and rock formations of the county. Most groundwater is derived from precipitation that has infiltrated and percolated through the soil after recharging the aquifer. The rates of recharge vary by location due to the diverse properties of soils on top of the underlying bedrock. After reaching the water table, groundwater moves towards points of discharge, such as surface waters, springs, and wells.

Figure 2-1: The Water Cycle



Source: United States Geological Survey

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-29*

Juniata County Comprehensive Plan

While surface water and groundwater are often characterized separately, it is important to acknowledge that they represent one resource. The two “feed” one another, and also have the potential to contaminate one another. Run-off and ground-based pollutants often percolate into the water table, degrading the groundwater. Contaminated groundwater, emerging from springs, wells, and marshes, can pose threats to surface water. There are several water resources protection strategies available as discussed below.

Critical Aquifer Recharge Area Identification (CARA)

Groundwater recharge refers to areas where water is added to the groundwater. These are areas where precipitation sinks into the ground, or a stream dives underground, sometimes called a swallow. Recharge occurs wherever the land surface is pervious and the water table is below the surface. However, some areas are characterized by features that provide an exceptional amount of recharge to the aquifer per unit area. These are termed critical aquifer recharge areas (CARAs). These areas are more vulnerable to contamination that could affect the potability of the water.

One indication of a high recharge area is a watershed containing a low tributary density. The high permeability results in a water table with a low gradient under the land surface, thus fewer perennial streams. Other features are very deep soils or weathered zones that lie above bedrock aquifers. These areas are high volume storage areas that allow slow percolation of water from the shallow groundwater zone into the deeper aquifer. Groundwater aquifers associated with high recharge areas are also at a higher risk of becoming contaminated.

Identifying and maintaining CARAs will maximize recharge and the amount of groundwater available for utilization. The following steps can be followed in identifying and protecting CARAs:

- Identify where groundwater resources are located
- Analyze the susceptibility of the natural setting where groundwater occurs
- Inventory existing potential sources of groundwater contamination
- Classify the relative vulnerability of groundwater to contamination events
- Designate areas that are most at risk to contamination events
- Protect by minimizing activities and conditions that pose contamination risks
- Ensure that contamination prevention plans and best management practices are followed
- Manage groundwater withdrawals and recharge impacts to:
 - Maintain availability for drinking water sources
 - Maintain stream base flow from groundwater to support in-stream flows.

Water Budget and Groundwater Availability Analysis

A water budget analysis provides an understanding of water flows through an area by treating the water resources of an area as an account, with recharge (income); withdrawals and in-stream flow needs (expenses); and storage (savings). Water budgets are useful for evaluating surface and groundwater resources available for development, troubleshooting water supply and well interference issues, and planning for future water needs. A groundwater availability analysis provides an assessment of the total volume of water withdrawn from (demand) and recharged to (supply) aquifers in a defined area, providing an indication of stress upon aquifers and stream base flow. When compared to projected demand in a defined area, a county, municipality, or other planning region can better prepare for targeting growth areas.

Wellhead Protection

Pennsylvania's Wellhead Protection (WHP) Program is a proactive effort designed to apply proper management techniques and various preventive measures to protect groundwater supplies, thereby ensuring public health and preventing the need for expensive treatment of wells to comply with drinking water standards. The underlying principle of the program is that it is much less expensive to protect groundwater than it is to try to restore it once it becomes contaminated.

A wellhead protection plan should detail the provisions of the local program including a schedule for implementation, and should demonstrate the commitment needed to support the ongoing efforts necessary for a successful local wellhead protection program. Therefore, the plan should not only describe how sources will be protected, but also document the resources necessary to implement the plan, thus linking implementation and management to finances. In order to be considered for DEP approval, a wellhead protection plan must have the following elements:

- Steering committee and public participation
- Wellhead protection area delineation
- Contaminant source inventory
- Wellhead protection area management and commitment
- Contingency planning
- New source planning

Well Drilling Techniques

State law requires drillers to have a valid rig permit and a Water Well Drillers License. They must also give the state and homeowner a copy of the Water Well Completion report. This report describes where, when, and how the well was constructed. However, when a new well is drilled, no state requirements for construction materials, yield, or quality apply. Pennsylvania is second among states in the number of residences served by private water wells, with more than a million households relying on private wells. Pennsylvania is also among only four states that do not have private water well construction standards. Poor well construction is increasingly the prime suspect in the presence of bacterial contamination. A properly constructed well minimizes the

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-31*

Juniata County Comprehensive Plan

threat of contamination entering the well, and keeps people healthy who might otherwise get sick from their own well water.

A few local and county governments have adopted standards for private water supplies, e.g. Chester and Montgomery Counties. Those rules and regulations have established minimum standards for the location, construction, modification, or abandonment of water wells and installation; required a permit for the construction of a water supply including production wells, test wells, test borings, and monitoring wells, and/or the installation of pumping equipment; and required a license for well contractors and pump installation contractors.

Other specific situations may also require additional regulations, including instances in which mortgages associated with federal housing may require certain water analyses for the well. Other lending institutions also may have sampling requirements, but for the most part, private well owners must take responsibility for their own water quality and for maintaining their well.

Groundwater Management Plans

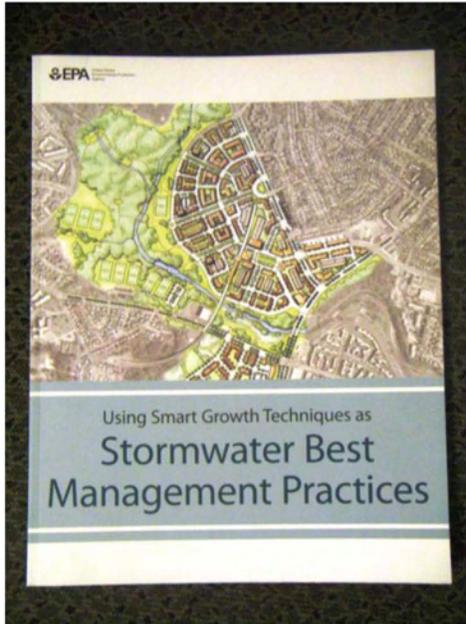
Groundwater management plans provide a thorough understanding of the watershed's hydrogeologic characteristics to protect and improve water supply reliability. The plan should address three components: identify existing and anticipated quantity and quality groundwater problems and management issues; recommend a series of actions needed to ensure the sustainability of the watershed; and address impacts on the resource, including those from growth and development, droughts, current and past mining, transfers out of watersheds, unknown and unregulated uses, and management measures. Components of the plan may include monitoring, as well as identification of wellhead protection areas and appropriate areas for development of groundwater models.

Water Supply Plans

The goal of a water supply plan is to provide a guidance document for municipal officials and local planners, water suppliers, and other interested groups to follow and implement as they address water supply needs for the municipality. The water supply plan provides basic information and the direction needed to make planning decisions to provide residents with safe, adequate, and reliable drinking water at reasonable cost.

These plans inventory and evaluate available data and information on water systems and service areas. Results are compared to existing water system capabilities and future water need. Water system overviews for each community water system include estimates of water demands; identification of potential deficiencies; formulating water supply alternatives; presenting preliminary cost estimates for the selected alternatives; and providing recommendations for implementing improvements. Water systems need to provide an adequate supply of water, treatment capacity, treated storage capacity, and fire flow. The plan presents recommendations on supply-side and demand-side options.

Stormwater Management Plans



Stormwater discharges are generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during precipitation events. Changes in watershed hydrology due to growth and development directly impact the availability and quality of water resources. For example, in areas where residents depend on wells for their drinking water supply, underground aquifers can be depleted because of increasing demand from new development and an associated decrease in infiltration as impervious surfaces replace natural land cover. Changes in watershed hydrology include:

- Increases in stormwater flows and flooding
 - Decrease in infiltration and groundwater recharge
 - Reduction in stream networks due to stormwater conveyances channeling water away from developing areas
- Lowering of stream base flows and groundwater levels
 - Increased contaminant loading to streams and groundwater

Proper stormwater management efforts attempt to minimize the above problems by addressing not only the quantity of stormwater produced, but also the quality of the stormwater and the amount of water that is lost from the watershed. The Pennsylvania Department of Environmental Protection promotes a comprehensive watershed approach to stormwater management to improve water quality and quantity through the use of best management practices (BMPs). The stormwater management approach integrates existing planning and regulatory requirements to reduce pollutant loads to streams, recharge aquifers, maintain stream base flows, prevent stream bank erosion, and protect the environmental integrity of receiving waters.

The types and degree of BMPs that are prescribed in the watershed plan are based on the expected development pattern and hydrologic characteristics of each individual watershed. The final product of the Act 167 watershed planning process is a comprehensive and practical implementation plan and stormwater ordinance developed with a firm sensitivity to the overall needs, i.e. financial, legal, political, technical, etc., of the municipalities in the watershed.

Integrated Water Resources Plans

Integrated Water Resource Plans (IWRPs) provide guidance to balance land use and growth that is consistent with the sustainability of aquifers and streams. Objectives outlined in IWRPs should be consistent with Pennsylvania's State Water Plan (Act 220) and should recognize stormwater, water quality, and aquatic resource issues. IWRPs are very comprehensive and include components of other water resource related plans, such as Act 167 stormwater management

Juniata County Comprehensive Plan

plans, groundwater management plans, wellhead protection areas, and water conservation. Water supply and wastewater planning needs are a component of the plan. The IWRP should allow a county to understand needs and opportunities within its watersheds, as well as present recommendations for improving and sustaining resources.

Water Conservation Plan

The benefits of implementing water conservation concepts throughout a water supply service area are many and should be carefully examined. Saving water will save money for consumers on water, sewer, and water heating bills. Demand for water has a pronounced impact on the environment by lowering stream flows, depleting groundwater aquifers, and in certain cases, requiring the impoundment of free flowing stream or the diversion of water from one drainage basin to another. Reducing per capita water use will decrease the amount of wastewater generated, and thereby maintain the operating efficiency of treatment plants over a longer period of time. Reducing water consumption will reduce operating costs for utilities, and will delay costly capital improvements. When compared to the cost of expanding existing facilities or developing new water sources, the most cost-effective alternative is conservation.

Pennsylvania's current water conservation program emphasizes education and guidance to reduce water use at the local level. DEP offers guidelines for designing a water conservation program. Under the provisions of recent legislation, the State Water Plan (Act 220), water conservation will continue as a voluntary program. The act establishes a formal program to promote voluntary water conservation and water use efficiency practices for all water users. As a resource to municipalities, DEP will create a Water Resources Technical Assistance Center to promote the use and development of water conservation and water use efficiency education and technical assistance programs. Act 220 also authorizes grants for water resources education and technical assistance.

Land Development and Zoning Ordinances

The most significant challenge for preserving future water resource goals is growth patterns and activities on land. Because local officials are responsible for planning for growth and have the authority to regulate the use of the land, they also have the most direct influence on water resources. The Pennsylvania Municipalities Planning Code grants direct authority to municipalities to regulate development activity through subdivision and land development ordinances and zoning ordinances (See Table 5-2 for status of land use regulations in each municipality). Many of the water resource protection strategies discussed in the water resources tool box section can be incorporated into one or both regulatory ordinances.

For example, the subdivision and land development ordinance may require that a development site plan include a specific amount of land for parkland, which could be part of a groundwater preservation strategy. Site design standards that promote pervious surface designs, e.g. porous pavement, can help to protect groundwater by controlling runoff and filtering potential pollutants to the underlying aquifer.

Juniata County Comprehensive Plan

Maps of specific features, such as critical aquifer recharge areas or wellhead protection areas can be incorporated into the zoning map through an overlay district. The overlay would impose an additional series of requirements to the permitted or conditional uses of the underlying district. For example, if vehicle fueling, maintenance, and storage are permitted uses, and if these uses were located in a wellhead protection area, they would require a containment system for collecting and treating all runoff and preventing the release of fuels, oils, lubricants, and other automotive fluids into the soil, surface water, or groundwater.

Key Practices for Members of the Community

Human uses often have the greatest impacts on water resources; therefore, educating the community is a necessary component in ensuring a water supply of adequate quality and quantity. Commercial and residential uses contribute to runoff from impervious surfaces, pollution from vehicles and chemicals, nutrient deposition from lawn fertilizers and septic tanks, and aquifer distribution from well withdrawals without recharge. Poor management of agricultural lands, in the form of excessive or poorly timed nutrient application or inadequate livestock fencing in riparian areas, can also have profound impacts on water quality.

- **Residential Practices**

- Limit lawn watering and fertilizing
 - If lawns and gardens use native plants and grasses, attractive landscaping can be created with plant life adapted to local climate and soils, limiting and often eliminating the need for additional water and nutrients.
- Proper care of septic tanks
 - Beyond eventual contamination of groundwater, periodic maintenance improves public health by limiting contaminants in septic backup and saturated areas.
 - Informing residents of basic routine upkeep, how to spot problems, and how often to pump, households will receive the added benefit of longer system life and fewer major, costly system repairs.
- Proper disposal of household pollutants
 - Items such as used motor oil, gasoline, solvents, paint, insecticides, batteries, oven cleaners, etc., can be very dangerous in areas where drinking water is obtained by wells. Educate residents on proper disposal of such pollutants.

- **Agricultural Practices**

- Nutrient management
 - This is often considered the most important tool and only takes a minor change in habit that costs the farmer nothing. Timely application of manures and fertilizers is critical. Coordinating application with precipitation and thaws means more can be absorbed by the soil rather than carried off. Applying only as much fertilizer and manure as your soils needs is also valuable, as soil is only capable of absorbing a certain amount of nutrients.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-35*

Juniata County Comprehensive Plan

- Maintain cover crops instead of fallow fields
 - Particularly in winter, this will help to prevent nutrient loss.
- Nutrient Trading
 - Where one farmer has a nutrient surplus and another has a deficiency, trading solves multiple problems at once. A simple agricultural bulletin board where farmers can post their needs and get in touch with one another could facilitate this.
- Fencing
 - Fencing horses and cattle out of streams except for specific crossings at watering areas prevents bank erosion and prevent manure from flowing directly into waterways. This can be done with inexpensive temporary fencing, and adjusted as needed.
- No-till agriculture
 - Transitioning to no-till agriculture is beneficial in crop farming. While it does require an initial investment, it has the benefit of retaining nutrients year round. Even without no-till, methods such as contour farming and tilling done at appropriate times can keep a great deal of nutrients on the field and out of the water.

History of Juniata County

Introduction

Juniata County was created on March 2, 1831, from part of Mifflin County and named for the Juniata River. The Seneca Indian name Juniata is said to mean “people of the standing stone,” but a later connotation favors the meaning, “blue waters”. Mifflintown, the county seat, was laid out in 1791 and incorporated as a borough on March 6, 1833. It was named for Governor Thomas Mifflin. **Table 2-8** lists the incorporation dates of the county’s 17 municipalities.

Table 2-8: Incorporation Dates of Juniata County Municipalities

Juniata County – An Eighth Class County			
Formed March 2, 1831 from part of Mifflin County			
Name	Incorporated	Settled	Incorporated From / Prior Status
Boroughs			
Mifflin	March 17, 1853	1849	Milford Township
Mifflintown	March 6, 1833	1790	Fermanagh Township
Port Royal	April 4, 1843	1812	Milford Township
Thompsontown	February 7, 1868	1790	Delaware Township
Second Class Townships			
Beale	February 8, 1843	1775	Milford Township
Delaware	February 3, 1836		Greenwood and Walker Townships
Fayette	December 4, 1834	1755	Greenwood and Fermanagh Townships
Fermanagh	About 1755	1754	Incorporated while part of Cumberland County
Greenwood	1767	1763	Incorporated while part of Cumberland County
Lack	October 23, 1754		Incorporated while part of Cumberland County
Milford	November 7, 1768	1755	Incorporated while part of Cumberland County
Monroe	July 24, 1858	1772	Greenwood Township
Spruce Hill	September 10, 1858	1762	Turbett Township
Susquehanna	July 24, 1858	1755	Greenwood Township
Turbett	November 20, 1815	1755	Milford Township
Tuscarora	1825	1767	Lack Township
Walker	1822	1765	Fermanagh Township

*Source indicates both dates

**1965 publication states, “Township Commissioners indicate both dates”

Sources: Pennsylvania Historical and Museum Commission, 2006; Pennsylvania Department of Internal Affairs, 1965

Squatters settled in the area and were evicted by the provincial government in 1750. After they returned, Indians raided them in 1755–1756. There was protection from Forts Bigham and Peterson, but the Indians captured Bigham.

The Pennsylvania Canal was the backbone of the early economy beginning in 1826, followed by the Pennsylvania Railroad in the late 1840s. The canal closed about 1900, and the Tuscarora Valley Railroad closed in 1934. Small clothing manufacturing continues to the present, but kosher poultry production is the biggest industry. Juniata is the fourth largest poultry-producing county in the state.⁴

Juniata County’s historical resources include historical buildings, bridges, places and districts. These resources are a portal to the past to be enjoyed and studied by current and future residents

⁴ Genealogical History of Juniata County.

Juniata County Comprehensive Plan

of the county. More importantly, county and local officials have recognized the importance of this history. The Juniata County Historical Society is the primary organization charged with preservation of the county's history. This section identifies significant historic structures and events that have been previously identified and acts as a conduit for historic preservationists to continue documenting and protecting the county's historic resources.

The presence of the Juniata County Historical Society, with its dedicated members, has served to preserve and protect the county's historic resources. With the input of this and similar organizations, the county can support many of the passive measures (i.e. ordinances, establishment of historic districts, etc.) that are available for historic resources protection. This plan addresses the need for maintaining those passive protections through measures such as preparing a historical resources inventory and map. The next step for historical preservation in the county is to add an active component to the preservation efforts, which incorporates and necessitates raising the level of awareness and increasing the participation of county residents through activities such as a community historical day or the presentation of yearly awards to residents for historic preservation activities. It is primarily through involving additional citizens in the preservation process and through actively pursuing historic preservation that further strides in historic preservation and integration of these resources into tourist destination points can be made within the county.

Inventory and Identification of Historic Resources

A comprehensive historic preservation program begins with the identification and evaluation of historic resources. Properties and historic districts in Juniata County that are listed in the National Register of Historic Places are shown in **Table 2-9**. There are several other properties which are eligible for listing in the National Register of Historic Places. These properties are listed in **Table 2-10**.

National Register of Historic Places

The Bureau for Historic Preservation manages the National Register of Historic Places for Pennsylvania. The program was established by the National Historic Preservation Act of 1966. Properties listed on the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. National Register properties are distinguished by having been documented and evaluated according to uniform standards. These criteria recognize the accomplishments of those who have contributed to the history and heritage of the United States and are designed to help state and local governments, federal agencies, and others identify significant historic and archeological properties worthy of preservation and of consideration in planning and development decisions. Such designation often changes the way communities perceive their historic resources and gives credibility to efforts to preserve these resources as irreplaceable parts of our communities. Listing on the National Register, however, does not interfere with a private property owner's right to alter, manage, or dispose of property.⁵

⁵ Pennsylvania Historical and Museum Commission

Juniata County Comprehensive Plan

Listing on the National Register contributes to preserving historic properties in a number of ways:

- Recognition that a property is of significance to the nation, the state, or the community.
- Consideration in the planning for federal or federally assisted projects.
- Eligibility for federal tax benefits.
- Qualification for federal assistance for historic preservation, when funds are available.

Table 2-9: Properties Listed on the National Register of Historic Places

Municipality	Historic Name	Address	Status	Status Date
Beale Township	Academia Pomeroy Covered Bridge	T-349, South of Academia	Listed	08/10/1979
Beale Township	Book Indian Mound		Listed	01/03/1986
Beale Township	Tuscarora Academy	Intersection L.R. 34005 & L.R. 34028	Listed	06/30/1972
Greenwood Township	Dimmsville Covered Bridge	L.R. 34009, Northeast of Dimmsville	Listed	08/10/1979
Milford Township	Lehmans, Port Royal Bridge	T-451, West of Port Royal	Listed	08/10/1979
Spruce Hill Township	Academia Pomeroy Covered Bridge	T-349, South of Academia	Listed	08/10/1979
Susquehanna Township	East Oriental Covered Bridge	L.R. 34013 (Also in Snyder Co)	Listed	08/10/1979
Susquehanna Township	North Oriental Bridge	L.R. 34012 (Also in Snyder Co)	Listed	08/10/1979

Source: Pennsylvania Historic Museum Commission, 2007

Table 2-10: Properties Eligible for Listing on the National Register of Historic Places

Municipality	Historic Name	Address	Status	Status Date
Fermanagh Township	Main Line Canal, Juniata Division		Eligible	12/04/1996
Fermanagh Township	Ronald Baade Property	RR 2 Box 742	Eligible	2/23/2004
Mifflin Borough	Mifflin Commercial Historic District	Main & Juniata Sts.	Eligible	03/27/1990
Mifflin Borough	Wright Boardinghouse	307-319 Mowery Street	Eligible	4/18/2005
Mifflintown Borough	Mifflintown Historic District		Eligible	4/14/2005
Milford Township	L.R. 34006 Bridge 34 20 0006 0 025970	L.R. 34006	Eligible	08/00/1998
Spruce Hill Township	Spruce Hill Lunch Building	S.R. 75 5 miles South of Port Royal	Eligible	03/29/2000
Turbett Township	L.R. 34006 Bridge 34 20 0006 0 025970	L.R. 34006	Eligible	08/00/1998
Tuscarora Township	American House, The		Eligible	06/19/2002

Source: Pennsylvania Historic Museum Commission, 2007

Historic Marker Program

Between 1914 and 1933, The Pennsylvania Historical Commission, predecessor to the current Pennsylvania Historical and Museum Commission (PHMC), installed bronze plaques to commemorate significant individuals, events, and landmarks throughout the state. However, during the 1920s and 1930s, it was realized that the plaques were difficult to read from a moving vehicle. For this reason, the PHMC, created by the state legislature in 1945, developed the modern style of historical marker.

PHMC revised its guidelines for historic markers in the 1970s to require, “that the person, event, or site to be commemorated have had a meaningful impact on its times and be of statewide or national rather than only local significance.” The most recent revision of the guidelines occurred in December of 1987 when the agency adopted a standard urging that, “significant subjects that have hitherto been given less attention by the Historical Marker Program receive more favorable consideration (other factors being equal) than subjects which have already had fuller coverage.”

There are nine sites identified by an Historic Marker throughout Juniata County. **Table 2-11** lists those sites and their locations.

Table 2-11: Pennsylvania Historical and Museum Commission Historical Markers

Marker Name	Marker Location	Marker Text
Juniata County	County Courthouse, Mifflintown	Named for the Juniata River, and noted for its scenery and wildlife. Indian trails, turnpike, canal and railroad made the area a major route for trade and travel. Mifflintown, county seat was incorporated in 1833.
Fort Bigham	SR 3002, .8 mile NW of Mexico	The site of this stockaded blockhouse is a few miles west in Tuscarora Valley. Built about 1754 to protect traders and settlers in this region. In 1756 it was destroyed by Indians.
Patterson’s Fort	SR 3002, .1 mile E of Mexico	A stockade built about 1755 to protect settlers from Indian marauders. Capt. James Patterson was builder and commandant. It was located to overlook the Juniata.
Tuscarora Academy	At site, SR 3017 at Academia	Founded in 1836, it operated as an academy until 1912. Building, erected 1816, was used as a church until 1849. Administered by the Pennsylvania Historical and Museum Commission.
Tuscarora Path	SR 3302, .9 mile NW of Mexico	Used by the Five Nations Iroquois in raiding tribes to the south, and later by early traders and settlers. It began one mile west of here and terminated in the Tuscarora region of North Carolina.

Source: Pennsylvania Historical and Museum Commission

The National Register and Historic Marker programs are just a couple of tools for identifying historical features in the county. There are also several sites of local significance, as described below.

Description of Locally Significant Historic Resources

The following descriptions have been prepared by the Juniata County Historical Society.

Pomeroy Academia Bridge



It is not known when the first bridge at Academia was built, or by whom but it crossed the Tuscarora Creek close to the old mill, Beer's Mill, that still stands in Academia. The bridge was wooden, as county documents record 'plank' repairs in 1870. The bridge was an important one crossing the Tuscarora Creek at this spot. It provided easy access for farmers to the mill as well as access to the village of Academia which had grown up around the Lower Tuscarora Presbyterian Church, the Tuscarora Academy and the Tuscarora Female Seminary.

In March of 1901, warm temperatures induced the breakup of ice on the numerous streams and creeks in Juniata County, and heavy rains and melting snow added more water to the streams. The resulting ice jams and flood-waters did major damage to bridges crossing the Mahantango and Tuscarora Creeks. The Mahantango Creek Bridge, at the county line dividing Juniata and Snyder Counties, was swept off of its foundation and destroyed. The Pomeroy Bridge, which crossed the Tuscarora Creek, dividing Beale and Spruce Hill Townships, was also extensively damaged though apparently it remained on its foundation.

The county commissioners met at the site of the Pomeroy Bridge on March 18th, found the bridge in an unsafe condition, and closed it to the public. One month later the April 11, 1901 Juniata Tribune noted that, "the condition of the Pomeroy Bridge hinders a great many people from attending church at Academia." A later paper also noted that the fording site near the bridge on the Tuscarora Creek was flooded and impassable.

Book Indian Mound

This was the headline that blazed across the Thursday, August 22, 1929 edition of the Juniata Sentinel. That summer, the Pennsylvania Historical Commission began an excavation and studies of the Indian mound that took place over a ten week period beginning early in August. It was then that the mound acquired its name since Holmes and Charles Book owned the land on which it was situated. In addition to the article noted above, the excavation was described in three subsequent newspaper articles published in the Juniata Tribune. The following is a synopsis of those articles.

This Indian burial mound has probably existed for hundreds of years. While no one knows its exact size when first discovered, The History Of...The Susquehanna and Juniata Valleys... published in 1886 noted that local residents reported it to be as high as 15 feet and that it covered

Juniata County Comprehensive Plan

an eighth of an acre. Others said it was 12 feet high and one hundred feet in diameter with an oval base. When *The History* was published, the mound was 30 feet long and 20 wide and its origins were thought to be the result of a battle between two hostile Indian tribes. Early landowners, disregarding its significance to the Native American culture, scattered most of the contents of the mound over their fields as fertilizer. Others, such as students from the Tuscarora Academy in Academia, searched the mound and removed Indian relics.

Juniata County Fairgrounds

The Juniata County Fairgrounds have been used for much more than just car racing events through the many years it's been in existence. These excerpts from a very informative book on the history of the fairgrounds, *A Grand View of the Juniata County Fair* explains the history of the Juniata County Fairgrounds.



Horse racing prevailed at the fair from the very first year in 1853 through 1955 when it was taken off the program. But, in 1963, the program returned and is still on the ticket today. Horse racing programs have differed through the years. As stated in the 1891 premium booklet, there were both runner (with rider on saddle) and trotter and pacer (harnessed) racing events. Several races were specifically for Juniata County-owned horses. Another race was held for horses that were without record and used exclusively for road purposes. Purses of \$50, \$125, \$150, \$200 and \$250 were awarded that year. Today's events bring the winners much bigger purses (approximately \$2,000) and are all harnessed attractions.

Racing changed significantly in 1938, when the first auto race was held on September 10th at Port Royal's famous one-half mile dirt track. The gate admission was 50 cents and it also cost the spectator another 50 cents to gain a seat on the grandstand that year.

People came to see many other things at the fairgrounds, including entries into various contests that awarded ribbons and monetary prizes. Premium payments on the 1891 premium list were for the best: wine, 25 cents; fruits, \$1.00, and leather made into ladies shoes, 50 cents. Stock animals continue to be a very popular fair entry. At one time they were paraded in front of the grandstand; they are now shown and judged at the animal barn at the northwestern corner of the fairground.

Events in front of the grandstand have changed considerably through the years at Port Royal. Racing events as well as entertainment including political speakers, acrobats, balloon ascensions, vaudeville acts, Grand Ole Opry stars and rock and roll bands have all performed in front of the grandstand for more than a century.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-42*

Juniata County Comprehensive Plan

The original wooden grandstand building was removed on November 7, 2000. The new aluminum grandstand structure was open for the first spectators on Saturday, May 26, 2001. A reserved seat season pass for the new grandstand was priced at \$25.00, plus the \$12.00 general admission cost.

Fort Bigham

Fort Bigham was a blockhouse and small stockade located about twelve miles from Mifflintown, in the Tuscarora Valley, on the plantation of Samuel Bigham. It was built by Bigham and three other Scotch-Irish settlers, John and James Gray and Robert Hoag about 1754 as a place of refuge and protection for themselves and their families from Indian attacks which were occurring with alarming regularity.

“These forts were not military forts. They were very small, makeshift affairs that were built by and for the protection of only four or five families. The frontier people were farmers, each family owning a few hundred acres of land, and of necessity, they were spread out and scattered. To protect themselves a few settlers would get together and ...build either one extra large cabin or several small cabins and surround it with a stockade fence. When trouble came they would rush there for safety.”⁶

On June 11th of 1756, Fort Bigham was attacked. It is not clear how many people were in the fort at the time of the attack but all but two were women and children as the other men had gone to look after their farms. Being undefended, the fort was captured and burned; some of the settlers were murdered and some were taken into captivity.

Fort Patterson

“There were two Captain Pattersons, and two Patterson Forts and they have been the means of much confusion.” So says Professor A.L. Guss in *The History of the Susquehanna and Juniata Valleys* published in 1886. James, the father (1715-1772) lived at Mexico and “had a house fitted up for the defense against Indians, soon after Braddock's defeat.” William, the son (1737-1782) lived opposite Mexico and also had a house fitted up for defense with logs but, “this house was not built until after the French and Indian War, probably in 1763.”

Pennsylvania Canal

The success of the Erie Canal in New York was one impetus to the development of plans for a canal system in Pennsylvania. Another was the economic demand for a waterway access to Philadelphia from western Pennsylvania for the products of Pennsylvania's farming, timber and manufacturing industries. Finally, on July 4, 1828, ground was broken for a canal system that would later be known as the Main Line Canal System. Ultimately, the Main Line Canal ran from Columbia, Pennsylvania to Pittsburgh, Pennsylvania with the 37 mile long Allegheny Portage Railroad in place between Hollidaysburg and Johnstown for crossing Allegheny Mountain.

⁶ DeMay, John A., *The Settlers Fort, of Western Pennsylvania* Closson Press, Apollo, PA 1997, Pg. 1.

Juniata County Comprehensive Plan

The Juniata Division began at the canal basin on a point of land called North's Island where the Juniata and Susquehanna Rivers merged and ran to Hollidaysburg, a distance of 127 miles. The Juniata Division had 86 locks, and 25 aqueducts, a water bridge that carried the canal over other streams that flowed into the river. The aqueducts were usually wooden structures on stone piers. From North's Island the canal followed the north bank of the Juniata River until it reached Huntingdon; from there much of the navigation was in the river itself.

Juniata River Bridge

Ever since the town of Port Royal has stood along the banks of the Juniata, and even long before, this spot along the river was a natural crossing place and was used by traffic moving westward through the valley. The first bridge, built in 1831, and another that was constructed in 1839 were both lost to bad weather and floods. The next bridge, which was a toll bridge, was built in 1851 and it too was lost in the disastrous 1889 flood.

The fourth bridge was built by the county in 1892 at a cost of \$16,500.00 and was a wooded covered bridge about 700 feet long. The piers were built of native stone with a concrete core, and the superstructure of timbers from the mountain. This bridge served the traveling public for a period of 45 years. On March 18, 1936, at four o'clock in the afternoon the St. Patrick's Day Flood destroyed it. The flood carried away three spans of the covered bridge, leaving behind three stone piers and one span of the wooden structure.

During the late spring and summer, the Highway Department engineers made three distinct surveys of probable sites for a new bridge; one on Milford Street, one on Market Street, and one on Tuscarora Street. The Highway Department decided to use the old site and immediately appropriated the necessary funds. Then, after further discussion with the town council and the Pennsylvania Railroad Company, the Market Street site was selected because it eliminated two very dangerous curves and a very steep approach.



Ground breaking occurred on January 22, 1937 with little fanfare and work on the first pier began shortly thereafter. In all, four piers were erected and the contractor and workmen encountered plenty of difficulties. The shovel, which was excavating earth, got swamped in mud after several rainy days; in April, the river came up within 12 feet of the previous high water mark causing delays; the gas shovel's boom struck a rock and was badly twisted and had to be replaced. Though the laborers worked hard, they had time to play as well. A water battle was described as "being fought, in good sportsmanship among the workmen. The concrete gang conceived the idea of chasing all the carpenters into the river. The concreters came across the river and landed on the

Juniata County Comprehensive Plan

road between the carpenters and the west shore, thus cutting off their retreat. The carpenters were permitted to lay out their valuables but into the river they must go. Contractor Quigley, realizing that he was next in line, removed his clean white suit with speed and ran into the river in his underwear. Those who escaped or were missed during the immersion escapade were carefully attended to the following day.”

Work began on the superstructure in July of that year, with the arrival of the first shipment of steel. A few days later, men, trucks, cranes, and other equipment were on site. The town turned out to watch as the steel girders arrived, and as a special crane was brought in to unload these huge girders from the trucks. The next day the cranes lifted the girders and put them into place on the bridge. After that the truss spans were erected and with that the bridge grew steadily longer day by day.

By the end of September the bridge began to get its first coat of paint, which was a sandstone color. After the first coat was applied, a second coat of drab was put on. It took 630 gallons of paint and 22 painters about 2 months to complete this phase of the bridge construction.

On December 27th, 1937 a state inspection of the bridge was completed and at 2:40 p.m. that afternoon the bridge was opened to traffic by the Water Street route. Two days later the Market Street approach was completed and also opened to traffic. By January 6, 1938 the final inspection was concluded.

McAlisterville Academy Soldiers’ Orphan School

It began as the Lost Creek Valley Academy in 1855 and offered secondary education for those interested in entering the teaching profession. In 1858, the stockholders sold the three story brick building and property to Professor George F. McFarland, then principal of the Freeburg Academy, in Snyder County.

“He immediately initiated improvements and enlarged the accommodations. The range of subjects offered included Mathematics, Science, Music, Language, Art and Physical Education. The academic year was composed of two semesters of 22 weeks. The campus encompassed 5 acres with spacious buildings, complete with a gymnasium. The student body varied in number from 43 to as many as 70 students from all parts of Pennsylvania and from other states including Illinois and Ohio.”⁷

In 1862, after the defeat of Union troops at the Second Battle of Bull Run, President Lincoln issued a call for more troops. George McFarland answered this call and after considerable effort raised a company of men, many of them teachers from the academy. They were designated Company D of the 151st Regiment of Pennsylvania Volunteers were mustered in for nine months service and after regimental training they were assigned to the First Army Corps and joined the army which was stationed near Fredericksburg, VA. Though they played only a minor role in the

⁷ Dreese, Michael A., *An Imperishable Fame: The Civil War Experience of George Fisher McFarland*, Juniata County Historical Society, Mifflintown, PA, 1997, pg. 6.

Juniata County Comprehensive Plan

battle of Chancellorsville, at the Battle of Gettysburg they suffered the highest loses of any regiment in the Union Army.

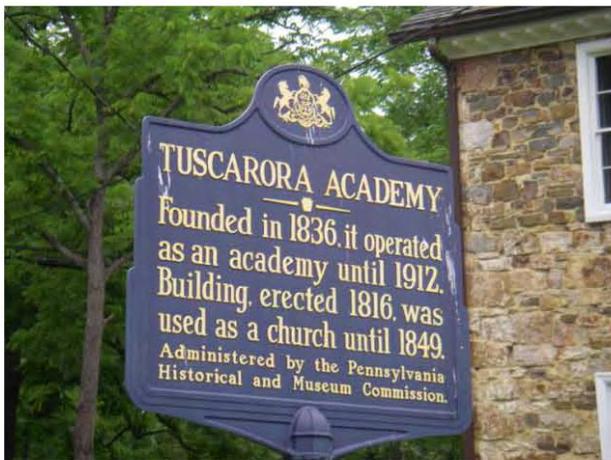
McFarland suffered serious injuries to both legs at Gettysburg, which resulted in the amputation of his right leg, and the permanent disability of his left, from which he never fully recovered. However, he returned to re-open the academy.

During this same time, the Pennsylvania Legislature, after many debates passed an act accepting from the Pennsylvania Railroad \$50,000 given for the, “education and maintenance of destitute orphan children of deceased soldiers and sailors.”⁸ On November 3, 1864, the academy, at the request of Dr. Burrowes, newly appointed as Superintendent of Soldiers’ Orphans, became the first soldiers’ orphan school.

“To accommodate the growing number of children, the academy built a kitchen with a large range, added a cistern, enlarged the dining room, and procured new desks and sewing machines. When it became apparent that the number of orphans to be provided for was larger than first anticipated and that better accommodations had to be secured, twenty acres of land were purchased and an additional brick building was erected. It was larger than the original academy building, and was four stories high with a finished attic. The cornerstone was laid, with interesting and appropriate ceremonies on July 23rd, 1866.”⁹

The McAlisterville Soldier’s Orphan School continued operation until 1899.

Tuscarora Academy



One of the oldest landmarks now standing in the Juniata Valley is the Tuscarora Academy building situated at Academia, about eight miles west of here. Although abandoned as a school for more than a decade, the old pebble-washed stone structure stands proudly in the midst of the scenic beauty and peaceful solitude of the Tuscarora Valley, the last of a group of buildings that comprised the school when it ranked high among the educational institutions of the state and nation. Unfortunately, much has been lost in the numerous fires that have razed the buildings at

different times since its inception and comparatively little of written or authentic oral tradition is available at this time.

⁸ Paul, Jules L., *Pennsylvania’s Soldier’s Orphan Schools*, Lane S. Hart, Harrisburg, PA, 1877, pg. 42-43.

⁹ *Ibid.* p. 197

Juniata County Comprehensive Plan

The Tuscarora Academy, the first institution of higher education in the valley, owes its existence to the Rev. McKnight Williamson. The Rev. Mr. Williamson was called to be the pastor of the Lower Tuscarora Church at Academia in the spring of 1825 and moved into the valley later that same year. Rev. Williamson's had been engaged in teaching the classics during his previous ministry and had taught lessons in the elements of Latin and in mathematics in his home during the first year of his pastorate in Academia. The



following year, he conceived the idea of establishing an academy for the double purpose of educating young men of the Presbyterian Church who desired to enter the ministry and of preparing teachers to conduct the public schools of this region. His plan met with the instant and hearty approval of John Patterson, a merchant of Academia, who donated \$2,000 in cash and a tract of land upon which the original buildings of the school were built. This liberal contribution from Mr. Patterson, along with many smaller ones from inhabitants of the valley, served to give the enterprise vitality. The necessary buildings were soon erected and the school opened. The school was incorporated by an act of the legislature in 1837 and placed under the control of a Board of Trustees. The same act also appropriated \$2,000 for maintenance of the school. This action on the part of the state gave the institution permanence. Mr. David Wilson, a very able educator, was the first principal appointed by the Board of Trustees. He remained at the head of the teaching staff until 1852, when he left Tuscarora Academy to be associated with Mr. David Laughlin, who was also a member of the faculty of the Tuscarora, in establishing the Airy View Academy at Port Royal then called Perryville. The ground upon which the present building stands had been granted by the state as a church site.

Juniata County Covered Bridge Tour

The covered bridge tour of Juniata County was prepared by the Juniata County Historical Society.

The Lehman Bridge

This self-guided tour begins in Mifflintown, the seat of government for Juniata County. At the square in Mifflintown, take SR 3002 (old Route 22) east to the intersection of SR 75. Turn right onto SR 75 and head south for 2 miles continuing through the town of Port Royal. On the outskirts of Port Royal, SR 75 intersects with SR 333. Turn right onto SR 333 heading west and continue on for 2/10 mile. The Lehman Bridge will be on your left.

The original bridge on this site was built about 1858. In 1972 this bridge was destroyed by the floodwaters of Hurricane Agnes. It was rebuilt with salvaged original timbers. It is 108 feet long

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-47*

Juniata County Comprehensive Plan

and is a two span Burr Truss design bridge, which crosses Licking Creek. It is on the National Register of Historic places and is privately owned.

The Pomeroy-Academia Bridge

The next bridge on the tour is the Pomeroy-Academia Bridge. Return to SR 75 and turn right, driving south for about 5 miles. At the Spruce Hill Lunch the road forks. SR 75 is the left fork, and SR 3013 is the right. Take the right fork, SR 3013. This winding, narrow road meanders through the countryside for approximately 1½ miles before it crosses the Tuscarora Creek. The covered bridge can be seen from the cement bridge that spans the Creek. You can reach the bridge from either end. Take Covered Bridge Road or cross Tuscarora Creek and turn right at the next intersection which is Old Mill Road. Parking is along the side of the road. Please be aware that the land around the bridge is private property. On the Covered Bridge Road side the access to the bridge is from the road so access is easier.

The Pomeroy-Academia Bridge is the longest remaining covered bridge in Pennsylvania being, 271 feet 6 inches long. It is also a double span Burr Truss design and was built in 1902, by James M. Groninger. It replaced an earlier bridge located closer up stream to the Pomeroy Mill. The Pomeroy-Academia Bridge is listed on the National Register of Historic Places. In 2003, the bridge was selected to be part of the Historic American Engineering Record (HAER) a project to document some of America's best surviving wooden bridges completed by a division of the National Park Service, United States Department of the Interior. It is owned by the Juniata County Historical Society.

Dimmsville Bridge

To reach the next bridge on the tour, you must return to Mifflintown. Get back on SR 3013 and continue to the intersection of SR 3013 and SR 3008 and turn left at this intersection. Go 1/10 mile and make a right turn onto SR 3015, following the signs for Academia. As you drive this short distance, you will pass a lovely stone farmhouse, and at the right turn onto SR 3015 sits a large stone barn. Drive 3/10 mile to a fork in the road with a stop sign. To your left is the Tuscarora Academy. Turn right onto SR 3017. Follow SR 3017 for about 2½ miles to the intersection of SR 35. Turn right onto SR 35. Take SR 35 north, passing through Mifflin. Take the bridge across the Juniata River and you will be back at the square in Mifflintown.

At the square, continue east on SR 35, Washington Street, passing through Mifflintown until you reach U.S. 22/322. Turn right onto U.S. 22/322 heading east. Get off at the Thompsontown exit. Turn right onto SR 333 east and drive to East Salem, a small village in Delaware Township. In East Salem, turn right onto SR 235 south and continue south, driving through the village of Maze. Approximately 3 miles south of Maze turn right onto SR 2017. From here it is approximately 1½ miles to the Dimmsville Bridge. The bridge sits on the left-hand side of SR 2017.

The Dimmsville Bridge was constructed in 1902. It is a single span Burr Truss structure and is 101 feet long. It is listed on the National Register of Historic Places and is privately owned.

*“Comprehensively enrich, protect, develop, and preserve Juniata County”
Natural, Water, and Historic Resources – 2-48*

Juniata County Comprehensive Plan

Shaeffer Covered Bridge

The next bridge on the tour is the Shaeffer Covered Bridge. Go back to SR 235 and turn right, heading south. At Seven Stars, stay on SR 235 continuing through this small village. Continue on SR 235 until reaching the intersection of SR 235 and SR 2023. Take SR 2023 to the village of Oriental. As you come into this small village make a right turn onto SR 2024, between the store and the hotel. Drive 3/10 of a mile.

The Shaeffer Covered Bridge is 91 feet long and was constructed in 1907. The Shaeffer Bridge is listed on the National Register of Historic Places and is privately owned.

Beaver Covered Bridge

The last bridge on the tour is the Beaver Covered Bridge. Return to Oriental. At the intersection of SR 2024 and SR 2023, turn right on to SR 2023. Continue through Oriental on SR 2023 for almost 2 miles. The Beaver Covered Bridge crosses the Mahatango Creek and sits on the border between Juniata and Snyder Counties. It is the only bridge on this tour that is still part of the state highway system. It was built in 1908, a multiple King Post design and is 64 feet long.

Juniata County Comprehensive Plan

Juniata County Cemeteries

Beale Township

- Book Indian Mound
- Brubaker Cemetery
- Lower Tuscarora (Academia) Presbyterian Cemetery
- St Paul's Lutheran Church and Cemetery
- Schwarey Family Cemetery (Amish)

Delaware Township

- Delaware Mennonite Church and Cemetery
- East Salem Methodist Cemetery, Otterbein United Methodist Church
- Emanuel Lutheran Church and Cemetery
- Harner Family Cemetery
- Lantz Family Cemetery
- St Stephen's Episcopal Church and Cemetery
- Thompson Family - Lock Cemetery
- Whiteland United Methodist Church Cemetery

Fayette Township

- Brown Burial Plot
- Cocolamus Church of the Brethren or Brown's Cemetery
- Coffman-Kauffman-Gingrich Family Cemetery
- Goodwill - Bunkertown – Shellenberger
- Hillside - McAlisterville Lutheran Cemetery
- Koons - Kuhns Family Cemetery
- Kreider Family Cemetery

- Lost Creek Mennonite Church and Cemetery
- Lost Creek Presbyterian Church Cemetery
- Trinity Lutheran Church Burials
- The Myers – Meiers – Leonard Family Cemetery
- Purdy - Sturgeon Family Cemetery
- Smith Family Cemetery
- Smith-Auker-Hostetler Family Cemetery
- St John's Methodist Cemetery

Fermanagh Township

- Bell Family Cemetery
- Hochstetler – Hostetler Family Cemetery
- Horning-Stambaugh Family Cemetery
- Kauffman-Rothrock Family Cemetery
- Old Hower Place - Speiglemoyer Run
- Pine Grove United Methodist Church and Cemetery
- Renno-Seiber Family Cemetery
- Russell Place
- Shields Family Cemetery
- Stoner Cemetery
- Wolfgang Family - Minertown Cemetery

Greenwood Township

- Bethlehem United Methodist Church Cemetery

Lack Township

- Beggars Row
- Black Log Church of the Brethren or Byron Run Cemetery

Juniata County Comprehensive Plan

- Cross Keys United Methodist Church and Cemetery
- Ferrier Family Cemetery
- Knepp Family Cemetery
- Kyle Family Cemetery
- McCleery Family Cemetery
- McWilliam's Cemetery
- Oppel / Opple Cemetery at Oppelville
- Patterson Family Cemetery
- Pollock Cemetery
- Upper Black Log Church of the Brethren Cemetery formerly German Baptist
- Upper Tuscarora Presbyterian Church and Cemetery
- Waterloo Methodist Cemetery

Milford Township

- The Blue Ridge Mountain Family Cemetery
- Eve Nipple Burial Plot
- Primitive Baptist Church and Cemetery
- Robert Campbell House Burial Ground
- St. Stephen's Lutheran Church and Cemetery

Monroe Township

- Brick Church or Shelley's Mennonite Cemetery
- Faith Lutheran Church and Cemetery
- Lauver's Mennonite Church and Cemetery
- Mount Zion United Methodist Church and Cemetery
- Niemond's Church Cemetery

- Richfield Union or Richfield Community Cemetery

Spruce Hill Township

- Book Farm Cemetery
- Ebenezer Methodist Church and Cemetery
- McKee Graveyard
- Primitive Baptist Church Cemetery
- Wharton Family Cemetery
- Wisehaupt Family Cemetery
- Yoder's or Hackett's or Amish Cemetery

Susquehanna Township

- Dresslers Ridge or Apostle's Union Cemetery
- East End Full Gospel Cemetery
- John Fritzling Grave
- Kain - Stroup Family Cemetery
- Leiningers Lutheran Church Cemetery
- Salem [Strawsers] United Methodist Cemetery
- St. James United Methodist Church and Cemetery
- St. Paul's United Methodist Church Cemetery
- St. Peter's Reformed Church Cemetery

Turbett Township

- Christian Brandt Family Cemetery
- Darrh-Darr Family Cemetery
- Kanagy Family Cemeteries
- Kilmer's Graveyard or Mount Hope Cemetery
- Little - Lytle - Sanderson Family Cemetery

Juniata County Comprehensive Plan

- New Church Hill Cemetery
- Old Church Hill Cemetery or Old Lutheran or Hertzler Family

Tuscarora Township

- East Waterford Cemetery
- Farmer's Grove - Church of the Brethren and Cemetery
- Hazel M. Palm Burial Site
- McCoysville Cemetery
- McCulloch's Mill - Middle Tuscarora Presbyterian Cemetery
- Old Jimmy Cummings Place Cemetery
- Pannebaker - Pennebaker Family Cemetery
- Robison-Crawford Family Cemetery

Walker Township

- Adams Cemetery
- Buchwalter Family Cemetery
- Cedar Grove Cemetery
- Cedar Spring Presbyterian or Glebe Cemetery
- Center Lutheran Church and Cemetery

- Free Spring Church of the Brethren Cemetery
- John Shearer Indian Burial Mound
- Locust Run Cemetery
- Mexico Cemetery
- Old Meeting House Burial Ground
- Old Order Amish Cemetery
- Philip Zendt Grave
- Scotch Irish Cemetery
- Thompson Family Cemetery
- Union or Union Memorial Cemetery
- Weaver Family Cemetery
- Wirt - Knox Family Cemetery

Mifflintown

- Messiah Lutheran Church and Cemetery
- Westminster Presbyterian Cemetery

Thompsontown

- Emanuel Lutheran Church and Cemetery
- St Stephen's Episcopal Church and Cemetery

Critical Areas

Significant historical resources throughout Juniata County are facing increased pressures from growth and lack of resources to implement preservation programs. It is important that these threats are recognized and that critical areas are identified so that an effort can be made to address such threats.

As populations move from developing counties into the more rural landscape in Juniata County, historical resources become threatened. Declining economies can lead to decreased property values, which in turn can encourage abandonment and blight. It is vital that the historic value of these older places and properties be recognized and that steps are taken to preserve these structures which provide a link to the past in Juniata County.

Juniata County Comprehensive Plan

Increased mobility has remained a driving force of the urban emigration that noticeably began in the 1950s. The automobile has catered to the individual and provided people with a sense of entitlement about where they may go and how quickly they ought to be there. As the demand for mobility increases, so does the demand for transportation improvements, specifically, new roads, bridges and highways. Historically, transportation planning has often neglected to incorporate land use planning or planning for the preservation of historic properties. As transportation improvements are suggested, it is important to recognize what effects they may have on historic resources of the area. The effect may be direct, such as a new highway project proposed through the homestead of a prominent individual in the community, or indirect, such as a highway project designed to bypass a downtown which could lead to economic decline. Better linkages between land use and transportation have developed in recent years, resulting in more sensitivity to the historic resources of communities.

Legal Foundation for Historic Preservation

Many historic preservation techniques and programs are available to facilitate historic resources protection. Most techniques and programs evolved from federal or state laws. An understanding of the legal foundation for historic preservation is helpful in determining what techniques and programs a Historic Resources Protection Plan should include.

Federal Level

The National Historic Preservation Act of 1966 (NHPA) earmarked the beginning of federal historic preservation policy. The NHPA was intended to stop the severe loss of historic resources in large cities and boroughs due to urban renewal. The legislation was intended to create a comprehensive framework for preserving historic resources through a system of reviews, regulations and incentives. The NHPA encouraged cooperation among federal, state and local governments to address historic resources protection. In Pennsylvania, the Bureau for Historic Preservation (BHP), an agency of the Pennsylvania Historical and Museum Commission (PHMC), is the state agency responsible for overseeing this coordination.

The NHPA formalized the National Register of Historic Places, on which a number of Juniata County resources are either listed or eligible for listing, as noted earlier in this chapter. The NHPA also instituted the review process, discussed below, for any project that receives federal funds. The act also authorizes the Certified Local Government Program, which enables municipalities to participate directly in federal preservation programs and to access through the state certain funds earmarked for historic preservation activities.

The National Register's standards for evaluating the significance of properties were developed to recognize the accomplishments of all peoples who have made a significant contribution to our country's history and heritage. The criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries onto the National Register. Criteria for listing on the National Register include the following:

Juniata County Comprehensive Plan

- property demonstrates significance in American history, architecture, archeology, engineering, or culture
- property possesses integrity of location, design, setting, materials, workmanship, feeling, and association,
- property’s significance was attained 50 years ago or more, and
- property
 - is associated with events that have made a significant contribution to the broad patterns of our history; or
 - is associated with the lives of persons significant in our past; or
 - embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
 - has yielded or may be likely to yield, information important in prehistory or history.

Additional information on National Register criteria can be found on the National Park Service website, www.cr.nps.gov/nr/, as well as that of the Pennsylvania Historical and Museum Commission (PHMC), www.phmc.state.pa.us/bhp/nr/.

Section 106 Review Process

The Section 106 review process requires that any project using federal funds, which includes most PennDOT projects, be reviewed for its impact on historic resources either listed on, or determined to be eligible for, the National Register of Historic Places. Section 106 does not directly prohibit alteration or destruction of these resources, but it does require a thorough investigation of alternatives and the consideration of mitigation measures.

State Level

The NHPA authorizes the appointment of a State Historic Preservation Office (SHPO) to administer provisions of the act at the state level. In Pennsylvania, the agency assigned to this responsibility is the Pennsylvania Historical and Museum Commission (PHMC). This entity is responsible for making initial determinations of eligibility for the National Register, managing state historic archives and administering a wide variety of historic preservation programs. PHMC is located at 300 North Street, Harrisburg, PA 17120. Programs and services of the PHMC are listed on its website, www.phmc.state.pa.us.

The Pennsylvania History Code pertains to conservation, preservation, protection, and management of historical and museum resources and identifies PHMC as the agency responsible for conducting these activities. It outlines Pennsylvania’s legal framework for historic preservation and mandates cooperation among other state entities in identifying and protecting historical and archaeological resources.

Juniata County Comprehensive Plan

Two Pennsylvania laws provide the legal foundation for municipalities to adopt historic preservation ordinances. These laws include Act 167 (the Historic District Act of 1961), which authorizes municipalities to create local historic districts and protect the historic and architectural character of the district through the regulation of new building, reconstruction, alteration, restoration, demolition, or razing of buildings within a certified local historic district. Local districts established under this act must be certified by PHMC. This act also requires the appointment of a Historical Architectural Review Board (HARB).

The second law is Act 247 (the Pennsylvania Municipalities Planning Code or MPC) which authorizes the use of municipal land use controls such as use regulations, and area and bulk regulations, to protect historic resources. The MPC specifically regulates places having unique historical, architectural, or patriotic interest or value through the creation of a specific zoning classification. The MPC further stipulates that a municipal plan for historic preservation shall be consistent with and may not exceed those requirements imposed under the following:

- Clean Streams Law
- Surface Mining Conservation and Reclamation Act
- The Bituminous Mine Subsidence and Land Conservation Act
- The Coal Refuse Disposal Control Act
- Oil and Gas Act
- Noncoal Surface Mining Conservation and Reclamation Act
- Agricultural Security Act
- An Act Protecting Agricultural Operations from Nuisance Suits and Ordinances Under Certain Circumstances
- Nutrient Management Act

County and Local Levels

At the county level, the county planning commission can support those municipalities that desire to adopt historic preservation ordinances, and integrate the county's historic resources with other community initiatives. At the local level, municipalities can adopt single purpose historic preservation ordinances and establish architectural and historic review boards. Generally, historic preservation regulations are integrated within a zoning ordinance; they also can stand alone as a single purpose historic preservation ordinance, providing the same level of protection.

A municipality that has an historic village or downtown can create a HARB to govern demolitions, new construction, and improvements. The HARB is defined as, "The agency that advises the township governing body on any requests for authorization to construct, alter, move, reconstruct, repair, restore or demolish all or a part of any building within the historic district." The HARB is typically composed of five members appointed by the governing body for a term of four years. One member must be a registered architect, one a licensed real estate broker, one a building inspector, one a member of the local planning commission, and one a resident of the municipality.

Juniata County Comprehensive Plan

Among other things, the HARB is responsible for:

- Providing recommendations to the governing body regarding the advisability of issuing any Certificate of Appropriateness
- Conducting a survey of buildings for the purpose of determining the historical and/or architectural significance and pertinent facts about them
- Proposing, as deemed appropriate, the establishment of additional historic districts and revisions to existing historic districts
- Formulating recommendations concerning the preparation and publication of maps, brochures, and descriptive material about local historic districts and/or architectural sites and buildings
- Cooperating with and advising the governing body, the planning commission, and other municipal agencies in matters involving historically and/or architecturally significant sites and buildings
- Advising owners of historic buildings on problems of preservation
- Cooperating with and advising the governing body about and developing and promulgating regularly scheduled public education involving historic preservation.

Benefits and Opportunities for Historic Resource Preservation

Historic resources preservation is most successful when it is integrated into the other aspects of planning that affect the municipality. For example, preservation of historic places can be directly linked to the preservation of open space, scenic roadways, and the provision of trails and bikeways. By incorporating historic resources into these other planning components, awareness of the number, type, and significance of the resources is raised within the county. The resources become part of people's everyday lives as they work, play, and enjoy the presence of the sites and structures. In essence, the resources remain a living part of the community, and not just some "old building" where they are expended as a frill or for purely nostalgic reasons. Consequently, there is an increase in the desire to protect such resources.

A primary focus of this plan is to harness community support to increase community participation in its preservation efforts. The work completed and on-going by the different historic preservation organizations in the county must be continued, and verifies the need to continue identifying historic resources and promoting the county's existing resources. This will ensure that these resources are protected for future generations to enjoy.

Preservation of the county's historical resources is important to the residents of the county. Historically significant properties and structures are located throughout the county, some of which are located in developing areas and require special attention, for example, in order to be conserved as a central feature in a subdivision or land development. However, identifying the location of these sites does not protect them from demolition or inappropriate alterations. The core belief behind protecting and preserving these resources is that the past plays an important role in residents' lives today.

Programs and Services

Juniata County Historical Society

Juniata County Historical Society
498B Jefferson Street
Mifflintown, PA 17059.

Web site: www.rootsweb.com/~pajchs/index.html

The Juniata County Historical Society was founded in 1931, the same year as the county's centennial celebration. The mission of the Juniata County Historical Society is the discovery, preservation, and publication of Juniata County's history. The society operates an Archives Room in the lower level of the county library in Mifflintown, where all of the society's resources for historical and genealogical research are located.

The society also maintains a small country museum in the only surviving building of the Tuscarora Academy, located in Academia, a small village southwest of Port Royal, in Beale Township. The Tuscarora Academy was the site of the first secondary school in Juniata County. The Tuscarora Academy Museum is open on Sunday afternoons in the summer months or by special arrangement at other times. A variety of displays highlight scenes from the past, an old post office, a doctor's office, a parlor scene, and the boarding rooms of students from the academy.

The society also owns the Pomeroy Academia Covered Bridge which crosses the Tuscarora Creek in the Academia area. This bridge, built in 1901 is the longest remaining covered bridge in Pennsylvania. It measures about 270 feet and was built by James Groninger, based on the designs of Theodore Burr (1771-1822) well known in Pennsylvania as a builder and designer of covered bridges. The Pomeroy Academia Covered Bridge was placed on the National Register of Historic Places in 1978. The society is presently seeking funding sources for the restoration of this county landmark.

Pennsylvania Historical and Museum Commission

The Pennsylvania Historical and Museum Commission (PHMC) preserves the Commonwealth's memory as a teacher and champion of its heritage for citizens of Pennsylvania and the nation. The PHMC was created by Act No. 446, approved June 6, 1945, amending the Administrative Code to consolidate the functions of the Pennsylvania Historical Commission, the State Museum, and the State Archives. The Bureau for Historic Preservation is part of the PHMC and serves as the State Historic Preservation Office (SHPO). The Commission is the commonwealth's official history agency, and the executive director is designated as the State Historic Preservation Officer. The PHMC is located at 300 North Street, Harrisburg, PA 17120 and can be contacted at 717-787-3362 or www.phmc.stat.pa.us.

The role of the bureau is to identify and protect the architectural and archaeological resources of Pennsylvania with a responsibility to work with individuals, communities, local governments, and state and federal agencies to educate Pennsylvanians about their heritage and its value, to

Juniata County Comprehensive Plan

build better communities through preservation, to provide strong leadership, both individually and through partnerships, and to ensure the preservation of Pennsylvania’s heritage. The bureau offers several programs to assist individuals and governments in managing historic preservation.

The National Historic Preservation Act, passed by Congress in 1966 and amended in 1980, created the Certified Local Government (CLG) program to ensure that local governments will be eligible to receive technical and financial assistance to strengthen their local historic preservation efforts and expand their historic preservation activities. The Bureau for Historic Preservation (BHP) helps local governments apply for and enter into the National Park Service’s (NPS) Certified Local Government program. In turn, local governments agree to expand their responsibilities through the enactment and enforcement of historic preservation ordinances, by the appointment of Boards of Historical Architectural Review (BHAR or HARB) or historical commissions, and by commenting on National Register nominations within their jurisdiction. In addition, they agree to provide a brief annual report of their preservation activities, have their BHARs participate in training opportunities, and undertake or update historic resource surveys. To help achieve these goals, BHP provides valuable technical assistance and matching grants to certified local governments.

The bureau administers the Federal Rehabilitation Investment Tax Credit (RITC) program in partnership with the National Park Service (NPS) and the Internal Revenue Service (IRS). The tax credit program is one of the most successful and cost-effective programs that encourages private investment in rehabilitating income producing, historic properties such as office buildings, rental housing, hotels, bed and breakfasts, and retail stores. Since the inception of RITCs in 1976, Pennsylvania has been a national leader in certified tax credit projects, completing over 2,055 projects and generating over \$3.3 billion in private reinvestment back into Pennsylvania communities.¹⁰

Preservation Pennsylvania

Preservation Pennsylvania (PPA) is the commonwealth's only statewide, private non-profit, membership organization dedicated to the protection of historically and architecturally significant properties. Preservation Pennsylvania, through creative partnerships, targeted educational and advocacy programs, advisory assistance, and special projects, assists Pennsylvania communities to protect and utilize the historic resources they want to preserve for the future. PPA offers technical assistance, financial assistance, publications, conferences and workshops and annual awards to encourage historic preservation.¹¹

¹⁰ Pennsylvania Historical and Museum Commission

¹¹ Preservation Pennsylvania

Pennsylvania Archaeological Council

The Pennsylvania Archaeological Council (PAC) is a statewide organization of professional archaeologists dedicated to promoting Pennsylvania archaeology. The specific goals of the organization are:

- To actively promote legislation in the best interests of archaeology in the Commonwealth of Pennsylvania,
- To assist and advise state and federal agencies within the Commonwealth in matters pertaining to historic and archaeological preservation and to encourage the highest standards of professionalism in such matters,
- To promote informed and creative archaeological research and to provide a vehicle for its dissemination,
- To promote the education of both the public and private sectors in all archaeological matters,
- To establish ethical and research standards for the conduct of archaeology in the Commonwealth, and
- To provide both scientific and moral leadership in all archaeological matters in the Commonwealth.¹²

Pennsylvania Downtown Center

The Pennsylvania Downtown Center (PDC) is the only statewide nonprofit organization dedicated solely to the revitalization of the commonwealth's core or traditional communities. The PDC provides outreach, technical assistance and educational services to communities interested in the revitalization of their central business districts and surrounding residential neighborhoods. The PDC primarily utilizes the National Main Street's Four Point Approach to downtown and economic revitalization. The PDC is also a strong advocate for downtown and neighborhood initiatives in the commonwealth and is active in many strategic partnerships which promote revitalization and reinvestment in the commonwealth's core communities.¹³

Pennsylvania Heritage Society

The Pennsylvania Heritage Society is the co-publisher of the award-winning quarterly *Pennsylvania Heritage*, and serves a critical role as the non-profit organization supporting the Pennsylvania Historical and Museum Commission (PHMC), the state's official history agency. With the support of over 5,800 members from every corner of the state and beyond, the Heritage Society works with the PHMC on a variety of projects to preserve and interpret Pennsylvania's history, art, and culture.¹⁴

¹² Pennsylvania Archaeological Council

¹³ Pennsylvania Downtown Center

¹⁴ Pennsylvania Heritage Society