

# Natural Resources and Environmental Features Profile

The purpose of the Natural Resources and Environmental Features Profile is to present a synopsis of current conditions of key environmental features and concerns identified in previous municipal comprehensive plans and other recent publications. An understanding of the region's environmental resources is essential to the development of goals, objectives and policies that will direct future land use and public service decisions.

Use of natural resources provides the residents of the region with essentials for human living, such as water supplies, recreation, food sources, natural building materials etc. However, excessive use of the land and natural resources may adversely affect important ecological functions and result in costly remedial efforts. For example, land development in floodplain and wetland areas inhibits natural stormwater storage functions, often times requiring costly solutions to correct the situation. In order to preserve sensitive features and work towards the sustainable use of natural resources, the community must identify the location and understand the importance of these features and resources.

The information contained in this summary highlights the environmental features and natural resources documented from review of existing studies and planning reports as listed below. Maps for the resources discussed were created from digital data provided from the York County Planning Department GIS inventory and from the Pennsylvania Spatial Data Access (PASDA) site available online at <http://www.pasda.psu.edu/>. The mapped resources and any interpretations derived from the mapped data are meant for planning purposes only and do not eliminate the need for site specific field surveys, testing, and sampling.

- ❑ Carroll Township Comprehensive Plan, 1988
- ❑ Monaghan Township Comprehensive Plan, 2000
- ❑ Carroll Township Act 537 Plan, 1999
- ❑ Dillsburg Borough Redevelopment Plan, 1999
- ❑ A Natural Areas Inventory of York County, Pennsylvania, Update-2002
- ❑ Northern York County Regional Plan, 1972
- ❑ The Geology of Pennsylvania, Pennsylvania Geologic Survey, 1999.

## Environmental Setting

### Physiography

A clear and spectacular relationship between bedrock type and topography characterizes the region's landscape of high ridges (i.e. South Mountain) and gently rolling topography. The region lies in three of seven physiographic provinces that divide the State into areas of similar surface formations and landscapes; the Piedmont, Blue Ridge and Valley and Ridge provinces. The vast majority of the region lies in the Piedmont province, with only a small area included in the Blue Ridge and Valley and Ridge provinces. The principle differences between the three provinces overall are relief,

altitude, and geographic position. The Piedmont province is characterized by lower altitudes and more subdued topography than the adjacent mountainous Blue Ridge province. The Valley and Ridge province is characterized by alternating valleys and ridges that trend northeastward from southwestern Virginia to east-central Pennsylvania and then eastward toward northern New Jersey.

The Piedmont province is adjacent to the Blue Ridge province at the base of South Mountain in the study area. The South Mountain area lies in the northern extension of the Blue Ridge physiographic province. The Valley and Ridge province is adjacent to the Piedmont province in Monaghan Township with the boundary between the two provinces roughly following the Yellow Breeches Creek. The portion of the region in the Valley and Ridge province is part of the Great Valley section, the most pronounced and persistent valley in the Valley and Ridge Province.

The Piedmont province is subdivided into three sections, the Gettysburg-Newark Lowland section, the Piedmont Lowland section and the Piedmont Upland section. The land area of the region in the Piedmont province lies entirely in the Gettysburg-Newark Lowland section. This section extends from the Maryland line south of Gettysburg in Adams County eastward to Bucks County on the New Jersey line. The section consists mainly of low rolling hills and valleys developed on red sedimentary rock. Sedimentary rocks in the Gettysburg–Newark Lowland Section were deposited in a long, narrow, inland basin that formed when the continents of North America and Africa separated more than 200 million years ago.

The highest elevation in the region is on South Mountain located in Franklin Township and is 1,412 feet above sea level. A weather resistant massive quartzite (Montalto member of the Harpers Formation) identifies the geology at this location. Isolated higher hills that stand a few tens of feet above adjacent areas are present in the region that developed on diabase intrusions. The lowest elevations in the region are found in the northern part of Carroll and Monaghan Townships along the Yellow Breeches Creek. Elevations in this area are less than 390 feet above sea level. In general, well-indurated sandstones and quartzite's form the highest elevations and carbonates almost universally underlie the lowland areas.

The engineering feasibility, construction, and economics of certain building projects may be strongly dependent upon the topography in a particular area. On-lot sewage disposal may be adversely affected by steep slope conditions. Generally, slopes over 25% are not suited for building construction, but can be used for open space and recreational purposes. Map 3-1 shows the percent of slope expressed as the number of feet rise in 100 feet of horizontal distance for the region. The steepest topography is found in Franklin Township on the side slopes of South Mountain (Blue Ridge Province) and along the Yellow Breeches in the northern part of Monaghan Township (Valley and Ridge Province).

### **Watersheds**

The term watershed is defined as the total land area that contributes runoff to a particular point along a waterway such as a stream, river and/or lake. Pennsylvania communities are finding that their water resources are degrading in response to growth and development. The way we live in a watershed and how the land is used greatly influence how much water is available and whether the quality of the water is suitable for

drinking, fishing or any other activities associated with aquatic environments. The region lays within the Lower Susquehanna River Drainage that is part of the larger Chesapeake Bay Watershed. The region can be further subdivided into three distinct subwatersheds, the Yellow Breeches, the North Branch Bermudian Creek and the Conewago Creek subwatersheds. The majority of the region is within the Yellow Breeches watershed. A small portion of land in the southern area of Monaghan drains to the North Branch of Bermudian Creek, a tributary to Conewago Creek. Conewago Creek drains into the Susquehanna River at York Haven.

## **Geology**

The knowledge of the subsurface environment is important when evaluating and planning for future land uses. For example, the cost of constructing building or road foundations is directly related to the strength of the rocks, relative saturation by ground water, weathering characteristics of the rocks and other geologic criteria. It is interesting to note that a small earthquake was recorded in the study area on June 16, 1997. Original speculation on the causes of the earthquake that it was related to collapse of one of the areas abandoned iron (magnetite) mines. However, it was determined that no mines were located in the vicinity of the epicenter. Geologists believe the seismicity is associated with the margins of the Newark and Gettysburg basins (Scharnberger et.al., 1999). This earthquake serves as a reminder of the relatively mild, yet persistent, seismic activity associated with the Gettysburg basin.

As shown in Map 3-2, the region is underlain predominately by the Gettysburg Formation and Triassic age diabase sheet and dike intrusions. Other formations that outcrop in the western portion of the region include Antietam quartzite, the Catoctin Formation, Martinsburg Formation, Montalto member of the Harpers Formation, Tomstown Formation, Waynesboro Formation and the Weverton and Loudoun Formations. The Antietam, Harpers, Weverton and Loudoun Formations combine to form the Chilhowee Group

The oldest rocks in the region, formed during the pre-Cambrian times (700 to 800 million years ago), are igneous Metarhyolites of the Catoctin Formation. These volcanic rocks are characteristic of a continental rift environment and are associated with the opening of the Iapetus Ocean (ancient ocean). The Weverton and Loudoun Formations (part of the Chilhowee Group) containing phyllite, quartzite, slates and limestone formed in a coastal to shallow marine environment during the Late Proterozoic some 570 to 600 million years ago. The youngest rocks in the region were formed during the Triassic period (210 to 250 million years ago) when this area was part of a lowland undergoing deposition of sediment from the newly formed Appalachian Mountains. This group of sedimentary rocks is part of the Gettysburg Formation consisting of mudstones, siltstones, shales and sandstones. Later volcanic intrusions, during the late Triassic period (210-250 Ma), of molten rock into the Gettysburg formation created the diabase dikes that exist in the area. Table 3-1 lists the geologic formations in the region and includes the description of the formation, approximate age and geologic map symbol.

**TABLE 3-1  
GEOLOGIC FORMATIONS IN THE NORTHERN YORK REGION**

<b>Formation / Rock</b>	<b>Rock Type / Age</b>	<b>Symbol</b>	<b>Description</b>
Diabase	Volcanic, Triassic (210-250 Ma)	Trd	Diabase sheet and dike intrusions on Triassic sedimentary rocks. Contact metamorphic rocks include primarily hornfels.
Gettysburg Formation (210-250 Ma.)	Sedimentary, Triassic (225-240 Ma)	Trgh	Reddish-brown silty mudstone, siltstone, and sandstone, and less abundant, cyclic red, gray or black shale and red to gray siltstone and silty mudstone.
Waynesburg Formation	Sedimentary, Permian (250 – 290 Ma)	Cwb	Shale, sandstone and impure limestone.
Martinsburg Formation (Hamburg Sequence)	Sedimentary, Ordovician (460 – 440 Ma)	Om	Part of the Hamburg Sequence consisting of shale and graywacke
Harpers Fm.- Montalto Mbr.	Metamorphic Late Proterozoic (590-1000 Ma)	Chm	Part of the Harpers Formation (2,500 minimum thickness) the Montalto Member is a massive quartzite
Tomstown Fm.	Lower Cambrian (590 – 580 Ma)	Ct	Dolomite – Source of phosphate mined in the early 1900s
ElBrook Formation	Middle to Upper Cambrian (545 – 500 Ma)	Ce	Pure dark limestone at the base, ridge-forming medium-gray limestone and dolomite in the middle, and light-colored calcareous shale and argillaceous to silty limestone at the top.
Weverton and Loudoun Fms.	Late Proterozoic (675-550 Ma)	Cwl	Loudoun Fm. (200 feet thick) contains varicolored phyllite interbedded with fine-grained graywacke and polymict conglomerate. The Weverton fm. (900 + feet thick) consists of laminated and crossbedded quartzose graywacke containing some quartzite and pyllite.
Ledger Formation	Middle Cambrian (550 – 525 Ma)	Cl	Light gray massive-bedded, medium to coarsely crystalline dolomite
Antietam quartzite	Lower Cambrian (570 – 550 Ma)	Ca	Well-laminated, calcareous metaquartzite with rust colored iron oxide pockets and molds of fossils.
Metarhyolite of the Catoclin Fm.	Pre-Cambrian (800 - 700 Ma)	mr	Igneous metabasalt rock containing moderately abundant phenocrysts of albiet and quartz

## **Soils**

### **Soils Classification**

The following summary of soils for the region is based on the updated York County Soils Survey and the Soil Survey Geographic (SSURGO) database produced and maintained by the United States Department of Agriculture, Natural Resources and Conservation Services (USDA-NRCS). The SSURGO database is a collection of soil and soil-related properties, interpretations and performance data for a soil survey area and its map units,

map unit components and component layers. Soil surveys aid in land-use planning by serving as an introduction to the soil resources of the area and by providing a source of information for the evaluation of the environmental and economic effects of proposed land uses. The Soil Survey of York County depicts the Northern York region as including four of York County's twelve general soils associations. Soil associations have a distinctive pattern of soils, relief, and drainage. Within a soils association there can be multiple soils series. The soils associations in the region include the following:

*Edgemont Association:* These soils are located on South Mountain in the northwestern corner of the County. They are dominantly hilly and have narrow, undulating and rolling ridgetops. Edgemont soils are channery and generally very stony. They overlie quartzite and conglomerate at depths greater than 60 inches. The association is about 75% Edgemont soils and 25% soils of minor extent. Soils of minor extent in the map unit within the region include Highfield and Glenville soils. Glenville soils are moderately well drained located in depressions and drainageways.

*Penn-Klinesville-Readington Association:* These soils are on highly dissected uplands and associated drainageways. They are dominantly undulating to rolling, but also are on some short, steep ridges, hills and nearly level to gently rolling lowlands. The association is about 40% Penn soils, 30% Klinesville soils, 15% Readington soils, and 15% soils of minor extent.

*Neshaminy-Lehigh Association:* These soils are dominantly smooth to rolling. They formed in residuum derived from diabase and porcelanite, on ridges, rounded hills, and adjacent lowlands. They are well drained to somewhat poorly drained. The association is about 48% Neshaminy and similar soils, 32% Lehigh and 20% soils of minor extent. Soils of minor extent in the region include Legore, Penn, Mount Lucas, Croton and Watchung soils.

The soils series is the lowest category of the national soil classification system and the name of the series is the common reference term to name soil map units. A list of soil series in the region and those characteristics that are important factors in land use planning and natural resources management are provided in Table 3-2 and shown on Map 3-3. More detailed soil characteristics are maintained by the USDA - Natural Resources Conservation Service (NRCS) in the Official Soil Series Descriptions (OSD) available online at <http://www.sstatlab.iastate.edu/soils/osd>. The OSD describe general and detailed information about each recognized soil series in the U.S.

Additionally, some 88 estimated soil properties are in the SSURGO data base tables including available water capacity; soil erodibility factors; hydric soil ratings; ponding, flooding, water table depth and duration; depth to bedrock; interpretations for sanitary facilities, cropland, woodland, and recreational development; and yields for common crops. The soil property database tables can be related to digital polygon soils data for detailed spatial analysis. The soils constraints maps produced for this report were developed using the SSURGO data.

**TABLE 3-2  
SOIL SERIES**

Soil Series Name	Soil Symbol	Prime Farmland	Limitation to On-lot Septic Systems	Building Development Constraints
Arendtsville gravelly loam	ArB, ArC	III	Moderate--depth to rock, percs slowly	Moderate--slope
	ArD		Severe--slope	Severe--slope
Athol silt loam	AtB		Severe--percs slowly, wetness	Moderate--slope, wetness
	AtC		Moderate--depth to rock, percs slowly, slope	Severe--slope
Baile silt loam	Ba		Severe--percs slowly, wetness	Severe--wetness
Birdsboro	BgB		Severe-wetness	Moderate--slope, wetness
Bowmansville	Bo		Severe--flooding, percs slowly, wetness	Severe--flooding, wetness
Brecknock	BrB, BrC, BrD		Moderate--depth to rock, percs slowly, slope	Moderate/Severe--slope
Chagrin silt loam	Cd		Severe--flooding	Severe--flooding
Clarksburg silt loam	CkA, CkB		Severe--percs slowly, wetness	Moderate--shrink-swell, wetness, slope
Codorus silt loam	Cm		Severe--flooding, poor filter, wetness	Severe--flooding, wetness
Soil Series Name	Soil Symbol	Prime Farmland	Limitation to On-lot Septic Systems	Building Development Constraints
Croton	CrA, CrB		Severe--percs slowly, wetness	Severe--wetness
Duffield	DuB		Severe--percs slowly, wetness	Moderate--shrink-swell, slope
	DuC		Moderate--depth to rock, percs slowly, slope	Severe--slope
Edgemont	EdB		Moderate--large stones, percs slowly	Moderate--large stones, slope
	EdC		Moderate--depth to rock, percs slowly, slope	Severe--slope
	EdD		Severe--slope	Severe--slope
Elk	EkA		Severe--flooding	Severe--flooding
	EkB		Moderate--percs slowly	Moderate--slope
Glenville	GdA, GdB		Severe--percs slowly, wetness	Severe--wetness
Highfield	HKD, HgB, HgC		Severe--depth to rock, slope	Severe--slope
Hatboro silt loam	<b>Hc</b>		Severe--depth to rock, slope	Severe--slope
Klinesville	KnD, KnE		Severe--depth to rock, slope	Severe--slope
Lansdale	LeB, LfC		Moderate--depth to rock, percs slowly	Moderate--slope
Legore	LgB, LgC		Moderate--percs slowly	Moderate--slope
	LgD		Severe--slope	Severe--slope
Lehigh	LhA, LhB		Severe--percs slowly, wetness	Severe--wetness
	LhC, LhD		Moderate--percs slowly, depth to rock, slope	Severe--slope, wetness

Soil Series Name	Soil Symbol	Prime Farmland	Limitation to On-lot Septic Systems	Building Development Constraints
Lindsay	Lw		Severe--flooding, percs slowly, wetness	Severe--flooding
Mount Lucas	MdA, MdB, MeB		Severe--percs slowly, wetness	Severe--wetness
Murrill	MvB, MvC		Moderate--percs slowly, slope	Moderate--shrink-swell, slope
Neshaminy	NaC, NdB		Severe--percs slowly, wetness	Severe--slope
	NaB, NdD, NdE		Severe--percs slowly, wetness	Severe--wetness
Penlaw	Pa		Severe--percs slowly, wetness	Severe--wetness
Penn	PbD, PcF, PeB, PeC PpB		Severe--depth to rock, slope	Moderate/Severe--slope
Klinesville	PoB		Severe--depth to rock	Moderate--depth to rock, slope
	PoC		Severe--depth to rock	Severe--slope
Raritan	RaB		Severe--percs slowly, wetness	Severe--wetness
Readington	ReA, ReB		Severe--percs slowly, wetness	Moderate--slope, wetness
Reaville	RfB		Severe--percs slowly, wetness, depth to rock	Severe--wetness
Rowland	Rw		Severe--flooding, percs slowly, wetness	Severe--flooding, wetness
Steinsburg	StC, StD		Severe--depth to rock, slope	Severe--slope
Watchung	WaA, WaB		Severe--percs slowly, wetness	Severe--wetness
Mt. Airy Complex	Urban Land			

Source: York County Soils Survey, USDA - Natural Resources Conservation Service (NRCS).

### **Development Constraints**

Soil characteristics are of prime importance in determining the suitability of undeveloped land for building construction. Characteristics that affect a site's suitability for development include a wide range of soils characteristics including steep slopes, wetness, depth to bedrock, frost action, low strength and flooding. A separate set of soil properties is considered for onsite sewage disposal including soil permeability (often expressed as a percolation rate), soil depth to bedrock, depth to water table, slope and flooding potential. It is important to identify and map those soils that possess these building development and on-lot sewage disposal constraints so that environmental and economic impacts of proposed land uses can be assessed during planning. Projected land uses can then be guided away from environmentally sensitive areas.

Map 3-4 shows the range of limitation classes from slight to severe of soils in the region for septic tank soil absorption suitability. Over 80% of the soils have a severe rating for septic tank filter fields, and 16% have a moderate rating. Over 50% of the soils are limited for septic tank absorption due to their slow rate of percolation; 25% of the soils are limited due to depth to bedrock; and 14% have slopes that exceed recommended limits.

Soil types are also important in the inventory process of vegetation or wetland areas as some natural communities and rare plant species are closely associated with specific soil types or characteristics.

### **Prime Farmland Soils**

The USDA identified prime farmland in the study area as part of the preparation of the Countywide soil survey. Prime farmland is defined as land best suited for producing food, feed, forage, fiber and oilseed crops. Areas considered to be prime farmland are those that have the soil quality, growing season and water supply needed to economically produce a sustained high yield of crops under acceptable farming methods.

The locations of prime farmland soils are shown in Map 3-5. Only 32.5% of the soils in the region meet the requirements for prime farmland. Prime farmland may now be in crops, pasture, woodland, or other land, but not in urban and built-up land or water areas. Once prime agricultural lands have been converted to uses other than agriculture, these areas are no longer considered prime farmland. Soil map units that make up prime farmland in the region are included in Table 3-2.

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, acceptable salt content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for long periods of time, and they either do not flood frequently or are protected from flooding. Due to loss of agricultural lands through development, these lands are increasingly being placed in agricultural security areas or easements for long-term protection from development. Recent changes in the Municipal Planning Code (Act 68 of 2000) advise municipalities to plan for the protection of prime agricultural soils now designated to be any soils with I, II or III class ratings.

The USDA gives all soils an agricultural rating as designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations for field crops and narrower choices for practical use. Class III soils have severe limitations that reduce the choice of plants and/or require special conservation practices to farm. Class III soils are not designated as prime farmland soils by the USDA.

## **Water Resources**

### **Surface Water**

Surface waters include streams and ponds, which provide aquatic habitat, carry or hold runoff from storms, and provide many opportunities for various types of recreational activities, including fishing, swimming, picnicing, walking and biking. The streams and rivers in the Northern York region drain one of three watersheds as illustrated on Map 3-6. The major streams in the region include the following named tributaries to the Susquehanna River:

- Yellow Breeches
- Fishers Run
- Stony Run
- Dogwood Run

- ❑ Pippins Run
- ❑ North Branch of the Bermudian Creek
- ❑ North Branch of Beaver Creek

Drainage to the Yellow Breeches Creek is from Dogwood, Fishers, Stony, and Pippings Runs and their respective tributaries. Drainage to the Conewago Creek is from Latimore Creek and the North Branch of the Bermudian Creek and their respective tributaries. The majority of the streams within the study area are not limited to one municipality and flow from one through another prior to their point of discharge. The northeastern part of the region (within the Yellow Breeches watershed) is drained by Stony Run and its tributaries. This stream provides the boundary line between Monaghan and Fairview Townships to the east. The North Branch of Beaver Creek, a tributary to the Conewago Creek, drains a small portion of Monaghan Township. A second stream, also known as Stony Run, drains portions of the central region of the study area in Carroll Township and Dillsburg Borough. Dogwood Run, originating near Camp Tuckhoe, and its tributaries drain the northwestern portion of the region (Yellow Breeches watershed), including the area in and around Range End Golf Course. The southern portion of the region (Bermudian Creek watershed), including most of Franklin Township, is drained by the North Branch of Bermudian Creek and its tributaries.

### **Groundwater**

Groundwater quantity and quality vary with the underlying geologic formations and associated land uses in the area. The issue of groundwater quality and quantity is important because the majority of the region's population relies on groundwater for domestic usage.

Groundwater in the region occurs in and moves through the secondary openings of water bearing geologic formations, including the Gettysburg Formation and the Elbrook Formation. Groundwater movement in secondary openings is primarily along joints and bedding plans, fractures and faults and in solution channels of limestone rock types. As rainfall percolates downward from the surface to the water table, the basic quality and chemical characteristics of the groundwater are established as various chemical components are dissolved from the surrounding soil and rock. There is always a potential for groundwater contamination in both urbanizing and rural areas. A draft wellhead protection plan has been completed by the Dillsburg Area Authority that addresses protection for groundwater resources.

### **Floodplains**

Floodplains are defined as those areas adjacent to streams that are subjected to periodic flooding by high water flows in the streambed. The natural stormwater storage capacity of floodplains helps to prevent flooding and protects streams and riverbanks from losing soil. The Townships' and Boroughs' ordinances strictly regulate development within their 100-year floodplain zones as required by State and Federal floodplain protection programs. Restricting development in the region's floodplains is a good solution to flood control and offers substantial social and environmental benefits as well preserving important environmental habitat and additional open space opportunities. One hundred year floodplains surveyed by the Federal Emergency Management Agency (FEMA) for the National Flood Insurance Program are shown on Map 3-6. If a floodplain area is utilized for construction, agriculture or recreation, the hazards must be

recognized and the land developed accordingly. Floodplains make ideal locations for nature-based recreational activities like hiking, fishing, birdwatching, etc.

## **Wetlands and Natural Habitats**

Wetlands are complex and sensitive ecosystems, characterized by a water table at or near the land surface for some part of the year, by soil conditions that differ from adjacent uplands, and by vegetation adapted to wet conditions. Wetlands are commonly referred to as marshes, swamps and bogs. The region contains both forested and non-forested wetlands. Wetlands mapped in the region by the National Wetlands Inventory (NWI) of the U.S. Fish and Wildlife Service are illustrated on Map 3-6 and total approximately 482 acres. NWI produces information on the characteristics, extent and status of the nation's wetlands. The Emergency Wetland Resources Act of 1986 directs the Service to map the wetlands of the United States and disseminate data as they become available.

Wetlands are nature's sponges, absorbing water during heavy rains so all of it does not run off directly from the land into rivers and streams. This helps to prevent flooding and protects stream and river banks from erosion. Most of the region's wetlands are located in floodplains and are effectively protected from development and encroachment through the municipalities' Floodplain Ordinances. Wetlands in floodplains are especially valuable, providing multiple benefits such as wildlife habitat, natural stormwater storage, groundwater recharge and water purification.

Protection of wetlands in the region at the municipal level is regulated by the "Environmental Rights Amendment" of the Pennsylvania Constitution (Act 1, Section 27), whereby municipalities have the responsibility to apply Section 27 in planning and regulation of land use. Section 27 provides a right, in very broad terms, to environmental quality and specifies the Commonwealth as "trustee of these resources."

Federal and State programs have been established that offer some protection for wetlands described as follows:

### **Federal Protection**

Section 404 of the Clean Water Act prohibits unauthorized placement of dredged or fill material into most wetlands. The program is administered by the US Army Corps of Engineers with EPA oversight.

Federal Farm Bill includes a "swampbuster" provision, which prohibits farmers who receive USDA benefits from draining, dredging, filling, leveling or otherwise manipulating a wetland after November 1990. The Farm Bill was revised in 1996 to give the farmers more flexibility in complying with wetland conservation by allowing options for mitigation.

### **State Programs**

Chapter 105 of the Dam Safety and Encroachments Act of 1978 requires Pennsylvania Department of Environmental Protection (DEP) to issue permits for activities and structures in bodies of water, including wetlands. Common regulated activities include filling of wetlands; construction of bridges, dams, docks, roads, and levees; dredging

bodies of water; and alteration of streambanks. The York County Conservation District also provides information on the State's wetlands protection program at the local level, registers general permits, and performs on-site investigations to attempt to gain voluntary compliance.

## **Woodlands**

Very little of the original forest cover of the region remains, having been cleared for agriculture and development or repeatedly logged for lumber and fuel over the last two centuries. The most significant older growth forest is the Anderstown Woods area located in Monaghan Township along the Yellow Breeches (see Unique and Endangered Plant and Animal Habitat section). Forested areas in the region have not been quantified separately from those areas identified as farmland; however, the majority of steeper slopes (slopes exceeding 25%) and areas along major stream and river corridors are forested. The largest contiguous area of forested cover in the region is located in Franklin Township on the steep slopes of South Mountain. The northeastern part of the region, primarily in Monaghan Township, has significant areas that are forested occurring predominately on steeper slopes and along the Yellow Breeches, which forms the border between Monaghan Townships and Upper Allen Township in Cumberland County.

Tulip poplar is currently a dominant species of many of the woodland areas. The composition of the forested areas varies with hydrology, slope position, aspect and degree of disturbance. In older forests, oaks, hickories, maples, beech and eastern hemlock are common associates with tulip poplar.

In addition to providing wildlife habitat and opportunities for recreation, woodlands provide natural storage for stormwater runoff, filter stormwater pollutants, and stabilize soils on steep slopes. In general, woodland areas are covered with leaves that act as a protective layer to the soil and reduce the possibility of sheet erosion. The decaying litter becomes humus that helps to form a highly permeable layer of soil helping to retard runoff from heavy rainfall and reducing downstream flood peaks while recharging underlying aquifers. These protective values are lost when the forest floor becomes disturbed, increasing the potential for erosion. While forest cover offers protection from floods and erosion, urban street trees provide relief from heat buildup during summer months.

Forests also play an integral role in the protection of the region's streams. Streams surrounded by forests run clear, even after heavy rains, and have stable banks. In areas not forested, streams often run brown with silt, and have eroding banks creating very real problems and costs. Rapid stormwater runoff and flooding become more common as land is cleared for farming, industry and housing.

## **Unique and Endangered Plant and Animal Habitats**

The importance of biodiversity is gaining recognition, whether it be a regional, State, or County-wide effort, it is recognized that all living things are part of a complex and balanced network, and the removal of a single species can negatively alter this balance in sometimes significant ways. Because the full significance of extinction is not always

readily apparent and the long-term impacts are difficult to predict, it is hard to justify to many people the importance of maintaining biodiversity.

The Commonwealth of Pennsylvania maintains the Pennsylvania Natural Diversity Inventory (PNDI) consisting of known locations of those species classified as Endangered, Threatened or Rare as listed by Pennsylvania Department of Conservation and Natural Resources (PADCNR), Pennsylvania Game Commission, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service and species recommended by the Pennsylvania Biological Survey. Information on PNDI is available online at <http://dcnr.state.pa.us/forestry/pndi>.

The Natural Areas Inventory for York County was completed by the Pennsylvania Science Office of The Nature Conservancy. The inventory identifies the location of rare, threatened, and endangered species and the location of the highest quality natural areas in the County. Priority rank values from 1 through 5 (1 as the top priority for protection) are assigned to inventoried sites based on rarity, quality, and threats or management needs of the elements at the site. Protecting sites can conserve the range of biological diversity in the region with the best occurrences of the County's natural communities and by protecting good populations of the County's sensitive plants and animal species. Highlights of the report with specific significance to the region are briefly described below.

State gamelands #243 Site – Lower slopes of a successional forest at this site support a fair quality population of plant species (tentatively undetermined) believed to be in danger of population decline. Two additional plant species of special concern were found at this site during a field visit in 2001. County Rank – 3.

Stone Head – Adjacent to the Camp Tuckahoe site, a PA-candidate animal species has been observed at Stone Head on several occasions during the 1990's. The extent and viability of the population has not been determined and requires further surveys. County Rank – 4.

Camp Tuckahoe – A small poor quality population of a plant species of special concern occurs in a low wet area adjacent to a stream at the camp. Additional fieldwork completed during site visits in 1996 and 1998 identified several additional patches and clumps of the same plant species. The boundary of the site has been enlarged to reflect these new populations. County Rank – 5.

Andersontown Woods – This site is considered to have local significance based on its size, diversity of wildlife and plant life, water quality protection, and recreation potential. High quality natural communities have not been located at the site, but there is potential for their existence. This site consists of a relatively mature forest and is located along the Yellow Breeches adjacent to an Upper Allen Township (Cumberland County) linear park. The forest is notable because of its maturity and the wide spreading crowns on the trees that are visible from the park. The site consists of a diversity of tree species, including eastern hemlock, chestnut oak, American beech, red cedar, and many others. Smooth alder and witch hazel occur in the understory along with ferns and wildflowers. County Rank – 3.

Yellow Breeches Creek Site – A swift flowing portion of the Yellow Breeches with two listed species considered rare in the State; these species require habitat with clean, swift flowing, relatively sediment free waters. County Rank - 4