

AGRICULTURAL AND NATURAL RESOURCES CONSERVATION PLAN

Land in the Region varies greatly in its suitability for different intensities of development. Some areas, such as flood-prone creek valleys, very steep sloped lands and wetlands, are not suitable for any development. Other areas are only suitable for very low-intensity development, such as moderately steep areas. Still other areas are appropriate for intensive development.

Open space can be preserved in public, semi-public or private ownership. It is important to preserve open space to:

- recharge groundwater supplies,
- protect the quality of creeks and the groundwater,
- provide an important visual relief between developments,
- preserve areas of scenic beauty, including scenic views,
- avoid development on lands that are prone to erosion or are otherwise not physically suitable for development,
- provide land for recreation, and
- preserve habitats and cover for birds, fish and wildlife.

The Land Use Plan recommends policies, such as promoting Open Space Development, that are intended to steer development away from the creek valleys and other important natural features.

AGRICULTURAL CONSERVATION

This section describes a variety of methods to encourage the continuation of farming in the townships. The Land Use Plan section further describes zoning incentives and disincentives that should be used to seek to preserve farmland.

Figure 1 shows areas with the best soils for corn and similar crops. The vast majority of the undeveloped lands in the region (not including lands that are steeply sloped) include prime agricultural soils. The very best agricultural soils are called "Class I and II." The "Class III" soils are good agricultural soils, but not as productive as Class I and II. Class III soils usually involve rolling hills. Unfortunately, many areas with the highest quality soils for crop farming have been subdivided - particularly because they were the lands that were often the easiest to build upon. For example, the best cropland soils are often the soils that are the most likely to be approved for on-lot septic systems.

However, it is important to remember that this classification system is primarily aimed towards corn, wheat and other crops. There are many other types of agriculture that do not need highly productive soils, such as Christmas tree farms, horse farms, poultry operations and forestry.

Encourage the designation of additional areas as agricultural security areas.

Large areas of farmland in the region have been designated as "Agricultural Security Areas" in Brecknock Township. These areas are shown on the Protected Land map. Cumru Township should work with property-owners to consider whether they are interested in a similar designation. A farmer voluntarily asks the Township Supervisors/Commissioners to include their land as an Agricultural Security Area. An Agricultural Security Area does not result in any additional regulations upon a private property owner, nor upon private development. There are no negative impacts to a private property-owner if they include their land in an Agricultural Security Area. Once designated, the landowner becomes eligible, if they wish, to ask to have their land preserved under an Agricultural Easement (as described below). Moreover, an Agricultural Security Area provides a

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farmer with extra protection against nuisance lawsuits, municipal regulations of agriculture and government condemnation. If a major road improvement or widening is proposed, it may be logical for a township to exclude the specific land areas that may be needed from an Agricultural Security Area.

Continue to promote use of agricultural easements to preserve farmland.



One of the many farms that can be found in the Governor Mifflin Area

The most effective method to permanently preserve farmland is through purchasing the “development rights” of the land. This program uses funds from the State and the County to pay property owners to preserve their land. Property owners voluntarily apply to the County for consideration. The farms are then ranked according to a set of standards, such as the quality of the soils for crops and the proximity to other farms that have been preserved. If selected, the landowner is paid the difference between the market value of the land and the value as farmland. A landowner can voluntarily agree to a payment that is less than this value, particularly if insufficient funds are available to the County for the full amount. In that case, the landowner can deduct the difference on their Federal income tax as a charitable donation. A permanent “Conservation Easement” is then placed on the land that permanently prevents its use for non-agricultural uses. The land remains privately owned and can be sold to another owner, provided the land is not subdivided and is not developed for non-agricultural uses.

Figure 2 shows areas that have been permanently preserved through agricultural easements. There are limited funds available each year to buy easements to preserve farmland, and many farmers must sit on a waiting list for years. During the time it takes a farmer to rise up on the list, he/she may face pressure to sell for development. Also, some farms may not rank high enough according to the standards to be funded – particularly if a farm does not have the best soils for crop farming.

The State now allows the County to make installment purchases of farmland easements. This guarantees a farmer that they will receive certain payments in future years – which should increase participation. It also helps landowners to spread out the income over more than one year, which can reduce the tax rates.

This matter is discussed further under the Natural Resources Conservation section.

Consider expanding Agricultural Conservation Zoning in parts of Brecknock Township, if there is grass roots support.

Agricultural Conservation Zoning typically involves limiting the total number of houses on a tract so that the majority of land is maintained in larger lots. For example, housing may be limited to an average of one home for every 5 or 10 acres. Those new homes would need to be placed on one or two acre lots, to avoid consuming excessive amounts of land. Any other lots would need to include a minimum of 20 acres. The new homes should be placed in locations that would minimize the alteration of prime farmland and that would minimize conflicts with agricultural and livestock activities.

This type of agricultural conservation zoning should be considered if there is grass-roots support for it among the majority of the affected property-owners. For example, out of four adjacent farms, three of the landowners may wish to see their land maintained as agricultural, while the fourth farm in the middle may be interested in development of their entire tract. In that case, agricultural conservation zoning could limit the number of homes on the fourth tract to avoid conflict with the other three tracts. This type of zoning is particularly worthwhile when large amounts of public money have already been spent to purchase conservation easements in a particular area. A farmer may feel more comfortable making large investments in their farm if they are assured there will not be a major housing development next door.

Consider permitting a wide range of farm-based businesses.

Many farmers cannot earn a full-time living on their farm work. Instead, many farmers need supplemental jobs. To encourage the continuation of farming, the townships' zoning ordinances should offer reasonable flexibility to farmers on larger tracts to have small businesses. These businesses could include small engine repair, sharpening services, wood crafting, farm equipment repair, sale of seeds and fertilizers and similar activities. The number of employees and the sizes of the businesses should be limited to prevent it from becoming a major commercial business. These activities can also be useful to encourage the repair and reuse of old barns.

Farm-based tourism is also valuable to increase revenue to farmers, and thereby help farmers afford to farm. These activities can include summer camps, Halloween events (such as haunted hayrides and corn mazes), bed and breakfast guest rooms, and other activities.

Furthermore, State law requires municipalities to allow farmers to conduct retail sales of their agricultural products on their property. These types of sales should be encouraged to help farmers capture a higher percentage of the retail value of their products. Authentic centralized farmers markets should also be encouraged for this purpose. Farmers markets can also be helpful to attract customers to downtowns, particularly on weekends.

Encourage farmers to utilize no-till farming as an option to conventional tilling techniques.

No-till farming is a way of growing crops or pasture from year to year without disturbing the soil through tillage. No-till is an agricultural technique which increases the amount of water that infiltrates into the soil and increases organic matter retention and cycling of nutrients in the soil. In many agricultural regions it can reduce or eliminate soil erosion. It increases the amount and variety of life in and on the soil, including disease-causing organisms and disease suppression organisms.

NATURAL RESOURCES CONSERVATION

Take full advantage of all funding sources for land preservation, including connecting interested landowners with available resources, using "Conservation Easements," and using County and State funds.

There are several other funding sources for land preservation. For example, municipalities, certain other organizations and land conservancies can apply for State grants for acquisition of recreation land.

Conservancy organizations can work with individual landowners to find ways to preserve their land. This often includes purchasing a property for a price that is lower than market value, and then helping the property-owner receive a Federal income tax deduction for the difference between the market price and the sale price. Conservancies also often work with landowners to find ways to sensitively develop part of their property, while permanently preserving other parts.

"Conservation Easements" can be used to permanently preserve land without outright purchase of the land. With a Conservation Easement, the land remains privately-owned. The easement involves the property owner voluntarily agreeing to donate or sell the right to develop his or her land. The property owner agrees to place a restriction in the deed of the property which becomes binding on all future owners of the land. The easement can be written in many different ways to restrict or not restrict certain types of activities. Most Conservation Easements prohibit the construction of new buildings and subdivision of the land. Conservation easements also may prohibit intensive forestry and re-grading of the land.

Often, a property-owner can receive Federal income tax benefits from donating a Conservation Easement. This could include a complete donation of the easement, or a sale of the easement for a price that is less than the value of the easement. For example, if an area of land is worth \$1 million, the development value might be \$400,000. The remaining \$600,000 would be the residual value of the property after the easement. If the landowner donates a Conservation Easement outright, it may be possible to deduct \$400,000 from their taxable income. Or, if the landowner sells the easement for \$200,000, they may be able to deduct \$200,000

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from their taxable income - \$400,000 of value minus the \$200,000 purchase price. This is known as a “bargain sale.” The same type of deduction could apply if the land is sold outright to a municipality or conservancy for less than its market value.

This type of land preservation is particularly beneficial to private property-owners. They can continue to live on their land, while receiving income from it. Depending upon how the easement is written, they may be able to have a range of income-producing businesses on the land, such as a golf course or a tree farm. With an easement, the property-owner could be paid in cash. In comparison, many developers only offer agreements of sale with many contingencies. The property-owner may not be paid for years, depending upon how long it takes to fulfill those contingencies, such as obtaining all development approvals. If a developer goes bankrupt, the property-owner may never be paid, even though their land has been tied up for years by the agreement of sale.

A landowner could also consider a blend of limited development and land preservation. For example, a landowner could seek approval for a limited number of new homes in locations that maximize the views from those homes. Those homes could look out over permanently preserved open space. As a result, a limited number of high value homesites could produce the same income as many conventional home lots. This concept is discussed under “Open Space Development” in the Land Use Plan section.

A variety of State funds are also available through the State Department of Conservation and Natural Resources for purchase of recreation land or conservation easements. Those programs typically require a 50-50 match with other sources of funding, and are competitive.

Municipalities have additional alternatives to raise money for purchase of recreation land and preservation of open space. A municipality is also allowed to use its own funds to buy easements to preserve land. Township-funded land preservation programs are particularly worthwhile to preserve farms that do not rank highly under the County’s easement program. When State agricultural preservation funds are used by the County, a point system must be used to establish priorities for buying easements. Under this system, the County program must give priority to the lands in the County that have the most productive soils for corn and that are adjacent to other preserved lands, among other factors.

Township funds are particularly valuable to provide matching dollars with State and County grants or funds through conservancy organizations. As noted above, most State land preservation programs require that 50 percent of the funds for an acquisition come from a source other than the State grant.

Once a land area is preserved, then adjacent property-owners are likely to rank higher in the point system when seeking County-State funding for an agricultural easement. Therefore, Township funding of land preservation can serve as “seed money” that makes is more likely to have nearby lands preserved.

One alternative is to require developers to provide recreation land within new developments, or to pay recreation fees “in lieu of” providing recreation land. These types of requirements are allowed under the State Municipalities Planning Code. The Land Use Plan also describes incentives that can be used in zoning to result in higher percentages of open space within new development.

A second alternative is to set aside funds from the general fund budget or to issue a municipal bond for land purchase and preservation.

A third option is to ask voters if they wish to have the municipality fund land preservation. This referendum may also involve asking voters to approve an additional tax that would be dedicated to land purchase. A bond is typically issued, with the annual payments on the bond funded from the tax receipts. State law allows voters to approve an increase in their earned income tax (up to 0.25 percent) or an increase in their real estate tax millage (up to 2 mills) or an increase in the real estate transfer tax (up to 0.25 percent).

The real estate transfer tax increase can be particularly attractive because it only affects properties that are sold, including new construction and re-sales. If a municipality is experiencing a high rate of construction, that

tax increase can generate tremendous revenue without affecting most existing residents. The real estate transfer tax option also has the least impact upon lower income residents who continue to live in their existing homes.

Preserve areas along major creeks in as natural a condition as possible.

Streams are valuable aquatic habitats that provide both active and passive recreation. The Governor Mifflin Region contains several major streams. Wyomissing Creek begins in western Cumru Township and flows northeasterly through Mohnton and Wyomissing, eventually emptying into the Schuylkill River near Center City Reading. Angelica Creek flows through wooded areas of Cumru Township, along the edge of Kenhorst, and then enters the Schuylkill River near Fritz Island. Allegheny Creek begins in Brecknock Township, and flows eastward and then northward to join the Schuylkill River further downriver. Two smaller streams, the Little Muddy and Muddy Creeks, drain southern and western portions of Brecknock Township. These streams eventually reach the Conestoga River in Lancaster County. All of these streams and the Schuylkill River are part of the Chesapeake Bay Watershed and part of the Chesapeake Bay Program. The Program is a regional partnership that directs and conducts the restoration of the Chesapeake Bay, and at this time is a priority of Pennsylvania.



Pond found in Brecknock Township

Land along creeks can be preserved in private ownership, in public ownership or by homeowner associations. The municipalities should seriously consider opportunities to acquire additional land along creeks for public passive recreation, particularly for hiking trails and picnic areas. This can build, for example, upon the large amount of recreation land that has already been preserved along the Angelica Creek and the Wyomissing Creek.

The Berks Conservancy prepared a Conservation Plan for the Wyomissing Creek. One of the main objectives of that Plan was to protect the water quality and fish habitats of the creek. To achieve these objectives, it is vitally important to maintain thick natural vegetation along creeks, and to re-plant areas along creeks where thick vegetation does not exist. This thick vegetation is essential to provide high quality habitat for fish and to filter out eroded soil and pollutants from storm water runoff. At best, to maintain the proper temperature of creeks and filter out pollutants, there should be mature canopy trees over a creek, plus thick underbrush. Dams can also interfere with the natural processes along creeks.

To comply with State requirements, the municipalities already have regulations that limit buildings within flood-prone areas. These regulations apply within the "100-year floodplain", also known as the 1% annual chance floodplain. The 1% annual chance floodplain includes areas forecast to be flooded during the worst flood expected in any given year. Figure 4 shows the 1% annual chance and 0.2% annual chance floodplains associated with the major waterways in the Area. The townships' provisions could be strengthened by prohibiting any new buildings in the 1% annual chance floodplain as opposed to allow new buildings in parts of the floodplain if they are flood-proofed. However, that type of provision is not recommended in the boroughs.

The municipal zoning ordinances could also be strengthened by requiring a setback of approximately 25 to 100 feet from the bank of major perennial creeks. These setbacks should vary by zoning district. A relatively narrow width (such as 25 feet) may be necessary in denser areas of the boroughs. A larger setback (such as 100 feet from the Schuylkill River and 50 feet from other perennial creeks) would be appropriate in less densely developed areas. This setback should apply for buildings, parking areas and business storage. These distances assume that the setback would be measured from the top of the primary bank. If the distance would

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be measured from the centerline of a creek, then a larger setback could be appropriate.

The preservation and creation of vegetated drainage swales should be encouraged. These types of channels slow runoff, allow recharge and filter out pollutants.

Many of the policies described in the Land Use and Housing Plan section can work to preserve the creek corridors, including promoting Open Space Development and Transfer of Development Rights and establishing very low density conservation residential zoning where appropriate. Property-owners may be required to restore wetlands where they have been altered in the past.

Continued efforts are needed to educate owners of properties with on-lot septic systems about the need for proper operation and maintenance of these systems to avoid groundwater pollution. The municipalities should continue to work to identify malfunctioning septic systems and inadequate cesspools and require their repair or replacement. Lower income homeowners can be linked with low interest loans from PennVEST to help fund repairs.

It may be appropriate to modify municipal Weed Ordinances to make sure that they do not prohibit appropriate natural landscaping (such as encouraging meadows that might only be mowed twice a year). Thick high vegetation is particularly appropriate along creeks. Furthermore, thick vegetation should be planted and permitted to grow along creeks and drainage swales in municipal parks.

Consider seeking a higher water quality classification for creeks in the Region.

The Pennsylvania Department of Environmental Protection (DEP) classifies all creeks according to water quality standards. The highest level of protection are “Exceptional Value” or “Outstanding Natural Resource Water” creeks. The next highest level of protection are “High Quality” creeks. The higher levels of protection involve much stricter regulations upon water quality, particularly for effluent from sewage systems.

Then, a basic level of protection involves “Warm Water Fisheries” or “Cold Water Fisheries.” Cold Water Fisheries are streams that should be protected as habitat for cold water fish and other fauna and flora indigenous to cold water. High Quality Cold Water Fisheries are cold water fisheries with excellent water quality and other environmental attributes. Trout Stock Fisheries are streams that qualify for trout stocking by the Pennsylvania Fish and Boat Commission.

Within the region, the Wyomissing, Angelica and Allegheny Creeks are all designated as Cold Water Fisheries. Muddy Creek is a Trout Stock Fishery from its source near Interstate 176 until its confluence with Little Muddy Creek in Lancaster County. While all of these streams are relatively healthy, none are designated as High Quality Fisheries.

Consideration should be given to working with local conservancies to seek a higher level of water quality protection for creeks in the region. This would require the submission of water quality studies and a petition to DEP.

Protect the amounts and quality of groundwater and creek waters. Stress recharge of storm water into the ground to maintain groundwater supplies and reduce storm water runoff.

Too often, developments are engineered to channelize storm water runoff towards a creek, without encouraging recharge of groundwater into the ground. We should think of stormwater as a resource that should be managed, and not as something to be “gotten rid of.” Groundwater recharge can be encouraged through the Manual entitled “Best Management Practices for Developing Areas in Pennsylvania,” which is available through the County Conservation District. For example, storm water can be held within “retention basins” that allow some storm water to be absorbed into the ground. Depending upon soil conditions, infiltration trenches and french drains can be used to recharge some runoff into the ground. However, care is needed in areas with limestone-based geology to avoid sinkholes. The natural drainageways should be left in place as much as possible, with wide swaths of green space that allow storm water to be absorbed.

The total percentage of a lot that is covered by buildings and paving should be limited to make sure that there are areas available for absorption of groundwater. For parking areas that are not used on a daily basis, alternative surfaces and materials (such as “porous paving”) should be considered that encourage groundwater recharge.

Ordinance provisions should be reviewed to make sure that they do not unintentionally increase the amount of land covered by paving. For example, sidewalks should only be required where they are truly needed. Front yard setbacks should be modest so that long driveways are not needed. Where cul-de-sac streets are used, a landscaped island should be considered in the middle of the cul-de-sac. Excessive amounts of parking should be avoided. Where there is a question about the amount of parking that may be needed, a developer can be allowed to reserve land for parking that would only be paved if the municipality determines it is actually needed after the use has been in operation. Adjacent businesses should be encouraged to share parking, which can reduce the total amount that is needed.

The Best Management Practices manual also includes recommendations of ways to control the water quality of runoff by avoiding the mixing of pollutants into runoff. For example, devices can be used to separate oils, greases and sediment from runoff. Whenever there is major earthmoving, a developer is required to prepare an erosion control plan that meets the requirements of the County Conservation District. It is equally important to regularly inspect construction sites to make sure that these erosion control measures are actually carried out.

The Clean Water Act Amendments of 1987 established new stormwater regulations to address stormwater that might impact water quality. Phase II of this regulation affected municipalities located within an “urbanized area” as defined by the 1990 and 2000 Census. These affected municipalities were required to apply for a National Pollutant Discharge Eliminations System (NPDES) permit in order to discharge storm water from their municipal separate storm sewer system (MS4). The permit is essentially the action plan for municipalities to incorporate 6 requirements of the permit, called minimum control measures (MCMs), into their stormwater management programs. The 6 MCMs include Public Education, Public Participation, Illicit Discharge Detection and Elimination, Construction Site Storm Water Runoff Control, Post-construction Storm Water Management in New Development and Redevelopment, and Pollution Prevention/Good Housekeeping for Municipal Operations Maintenance. Figure 5 shows the portions of the Region designated as “urbanized area” for the 2000 and 2010 Census. As well, the map indicates which watershed the urbanized areas are part of.

On June 4, 2016, the Department of Environmental Protection (DEP) published a final, renewed NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (PAG-13) in the *Pennsylvania Bulletin*. It is imperative that the municipalities review their current permits and new requirements for renewing permits in order to avoid potentially costly penalties for non-compliance.

A link to the PAG-13 General Permit and supporting documents are available through DEP’s website, www.dep.pa.gov/MS4.

Carefully manage wooded areas and avoid clear-cutting.

South of Mohnton, Shillington and Kenhorst, much of the Region is a patchwork of woodland and open fields. There are several notable clusters of contiguous woodland in Cumru and Brecknock Townships. The largest wooded area can be found in the extreme southern tip of Brecknock Township. While much of this enclave of wooded hillsides is privately owned, some is contained within State Game Lands # 52. In the center of Cumru Township, Nolde Forest Environmental Education Center contains nearly 700 acres of second-growth forest. Once the estate of a wealthy industrialist, Nolde is a scenic and recreational resource



Woodlands found at Nolde Forest Environmental Education Center in Cumru Township

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just minutes from the population centers of the Governor Mifflin Area. Other heavily wooded areas include the Mohnton Game Preserve lands on Welsh Road, Sheerlund Forest (across Route 625 from Nolde), and land surrounding the Horseshoe Trail near Route 625 at the county line. These three areas are all privately owned.

Most forested areas of the Region are located on areas that were too steep, too wet or too rocky for crop farming. The woodlands in the region add character to the landscape, help preserve the water quality of creeks and provide important wildlife habitats. Trees also are important to purify the air and control erosion.

Forestry must be allowed under State law. However, clear-cutting of woods should be prohibited, proper erosion controls should be in place for any large-scale tree-cutting, and other appropriate forest management practices should be used. Intensive forestry can be prohibited along creeks and be carefully limited on erosion-prone steeply sloped areas.

In development plans, developers should be required to show that they have minimized the removal of woods as part of their project. Great care should be used during construction to minimize the number of trees that are removed. Trees can add substantial value to a residential lot. During construction, temporary wood fences should be placed around trees to prevent the compaction of root systems by equipment and to prevent damage to tree trunks.

Certain areas of the region should be considered for re-forestation – particularly steep lands and lands along creeks. Funding for tree-planting programs are available from a few sources, including the Federal Urban Forestry Program, the Federal Transportation Enhancement Program (along a major highway) and Federal and State water quality programs. Some programs are limited to public lands, while others provide funding to private property owners. A Federal conservation program also provides funding to farmers who take steep areas and areas along creeks out of crop production.

Carefully control large-scale withdrawals of groundwater and spring water.

The municipalities should consider regulations that require careful review of large withdrawals of groundwater and water from springs. The applicant should be required to provide professional hydrological studies showing that the withdrawals will not harm the water supplies of neighboring homes and farms, particularly during drought conditions. This concern particularly involves water bottling operations that remove large volumes of water out of the area. If a large water withdrawal is proposed, it should be accompanied by permanent preservation of substantial amounts of surrounding land to allow sufficient groundwater recharge.

However, municipalities need to recognize that Delaware River Basin Commission regulations and State law may pre-empt the ability of a municipality to prohibit or severely regulate a large water withdrawal.

Carefully minimize sinkhole threats in limestone areas.

Portions of the northern part of the Region have limestone-based geology that is prone to sinkholes. This is also known as “karst” or “carbonate” geology. Limestone-based areas can be particularly vulnerable to sinkholes when there are mining activities, which can affect changes to the groundwater levels.

Stormwater runoff has a major role in the creation of sinkholes and other subsidence. The most important issue is usually to carefully design stormwater facilities and to use great care near isolated low spots in the ground, which are known as topical depressions. Water line breaks also often result in very severe sinkholes.

It may be appropriate for Cumru Township to consider provisions in its Subdivision Ordinance to address limestone geology issues as part of new development. These regulations could require a study by a specialist in this type of geology before any significant development is approved. This type of study may require soil borings. This study should consider the most vulnerable locations for sinkholes and state what types of measures should be carried out during development to reduce the threat of sinkholes. This study should then be reviewed by a second expert selected by the municipality but funded by the developer.

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In limestone-based areas, stormwater detention basins should be required to have an appropriate liner. Where development is proposed near a sinkhole, the sinkhole should be required to be re-mediated. This often involves excavating the area and filling it with concrete or other approved material. Sinkholes should be repaired as soon as possible before they expand in an uncontrolled manner. Stormwater should not be directed towards a sinkhole that has not been re-mediated.

Make sure that any changes to suspected wetlands comply with state and federal regulations.

Wetlands are areas that have vegetation and soil types characteristic of a permanently or frequently saturated environment. Wetlands are delineated based upon soil types, depth of the water table and the types of vegetation. Wetlands not only include swamps, but also areas that are typically wet during parts of the year.

Hydric soil types can also indicate the approximate locations of areas that may include wetlands. There are many other wetlands which would need to be identified by a qualified professional at the time any individual site is proposed for development.

Wetlands mainly exist along the creek valleys and the Schuylkill River floodplain. Wetlands also surround many of the man-made ponds and small lakes in the area.



The Schuylkill River in Cumru Township.

It is extremely important to protect wetlands to protect water quality, control flooding, provide aquatic habitats and recharge groundwater. The municipalities and local residents need to help State and Federal agencies make sure that there is compliance with wetland regulations. In addition, attention is needed regarding areas with hydric soils that are likely to include wetlands. Within these areas, an applicant for development should be required to provide a study by a qualified professional to determine whether wetlands will be impacted.

Each municipality should consider requiring a setback of at least 20 feet between a designated wetland and a proposed new building. This setback is valuable to help keep construction equipment out of the wetlands and to avoid other alterations to wetlands after construction.

Minimize development on steeply sloped lands.

Much of the Region is covered by land with steep grades, due mostly to the prevalence of intertwining ridges and steep ravines. An especially steep area runs west-to-east, running south of Mohnton, Shillington and Kenhorst. This incline continues eastward along the banks of the Schuylkill River. Another concentration of very steep slopes is north of Mohnton. The flattest areas in the Region are found in the Borough of Shillington, and on the north side of Allegheny Creek along Route 568.

A 15 percent slope would have a rise of 15 feet for every 100 feet of horizontal distance. Moderately steeply sloped lands (15 to 25 percent) should be limited to low intensity development, such as one acre minimum single family detached house lots. Very steep lands (over 25 percent) are generally not suitable for any development.

If development occurs on over 25 percent slopes, a large lot size should be required (such as over 2 acres). The disturbance of trees and other natural vegetation on the steep areas should be minimized to avoid erosion.

It is important to limit development on steep slopes to avoid the following: erosion problems, high speed storm

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water problems, overly steep roads and driveways, excessive costs to construct and maintain roads and utilities, and destruction of scenic natural resources.

Consideration should be given to strengthening zoning regulations to control development on steeply sloped lands. For example, if a new principal building would be proposed on steep slopes, larger lot sizes could be required. These additional requirements would not apply if a portion of a lot was steeply sloped but was not proposed for any development.

For example, in the townships, it would be desirable to require a minimum lot size of at least one acre if a principal building would be built on 15 to 25 percent slopes, and two to five acres if the building would be built on slopes over 25 percent.

Seek to maintain interconnected corridors for wildlife.

Ideally, corridors along steeply sloped areas and along creeks would be permanently preserved as interconnected open space. In addition to the benefits of preserving natural features, these inter-connected corridors also provide cover for wildlife to move throughout the region. It is particularly important to have areas with woods or other thick natural vegetation that connect large areas that have been preserved. Too often, land preservation involves fragmented areas that do not allow for wildlife travel.

Work to conserve Outstanding Natural Areas.

In 2014, the Pennsylvania Natural Heritage Program updated the Berks County Natural Heritage Inventory, a list and mapping of “critical” land areas with unique natural features. In most cases, these areas provide habitats that could support rare and endangered plants or animals. The Natural Heritage Inventory contains a) sites of local importance and b) sites of statewide significance.

These critical habitat areas are included on the Pennsylvania Natural Diversity Index (PNDI), a comprehensive database of outstanding natural habitats and sensitive plant and animal species on a state level. Species in the PNDI are given endangered, threatened, special concern or concern status. More information can be found on the PNDI website at: <http://www.naturalheritage.state.pa.us/>. Through this website, the latest version of the county’s inventory can be accessed which provides a site description, threats and stresses, and conservation recommendations for each natural heritage area.

Within the Governor Mifflin Region, Neversink Mountain is a natural heritage area with a regional significance ranking. Regional ranks include sites which have regional importance for biological diversity and these Pennsylvania sites are important for maintaining representation of the species in the greater Northeast/mid-Atlantic region. Sites in this category generally contain one or more occurrences of species of global concern or concentrations of species of lower significance. Neversink Mountain, an isolated formation of the Reading Prong, rises 700 feet above the Schuylkill River and the City of Reading. Neversink is known to contain habitat for two butterfly species of concern, seven plant species of concern, and one sensitive species of concern. While a transmission line clear cut and several residences exist on the mountain, much of the remainder is a designated “reserve” area. Neversink Mountain lies within six different municipalities, which can pose challenges in the alignment of preservation ordinances.

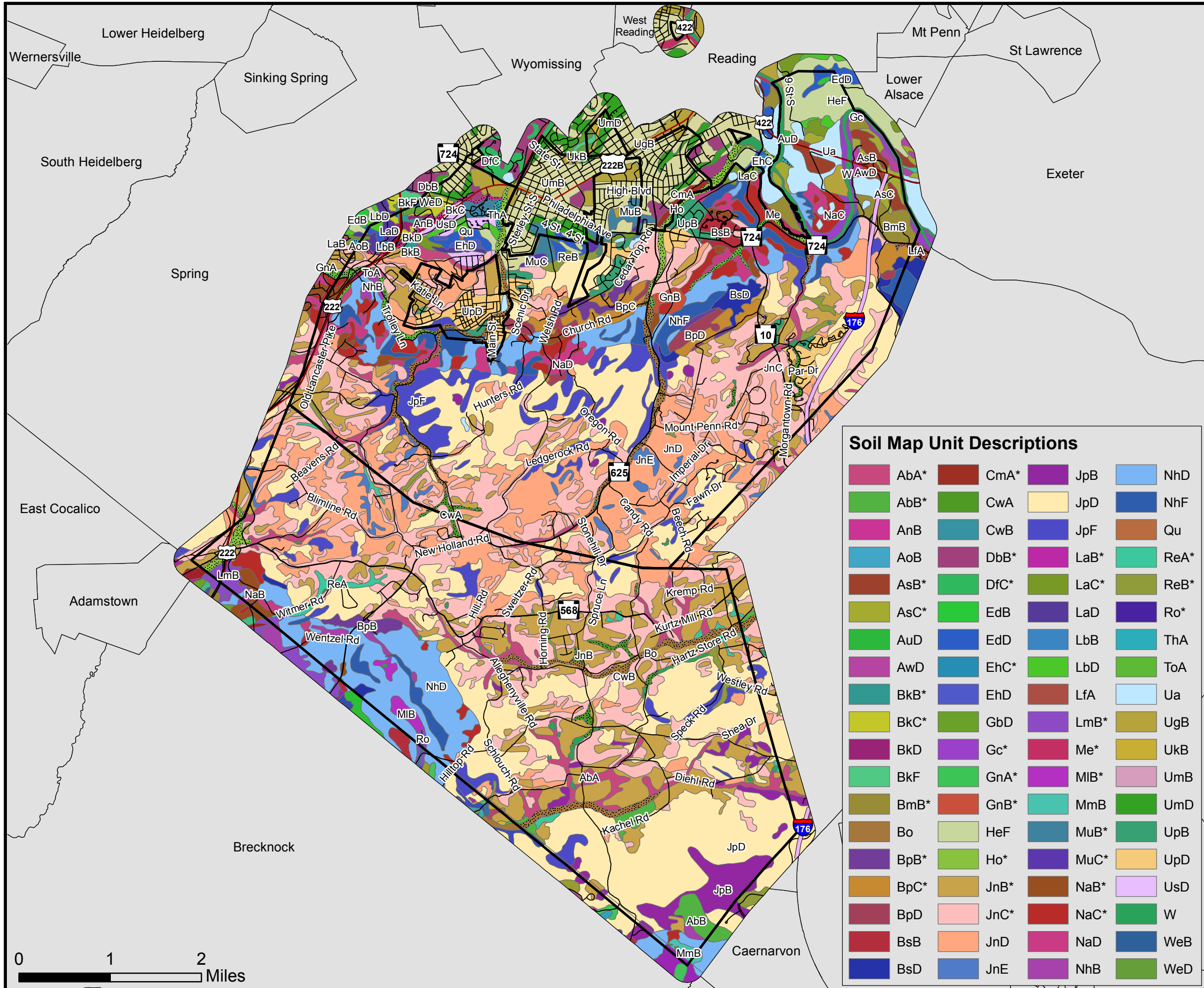
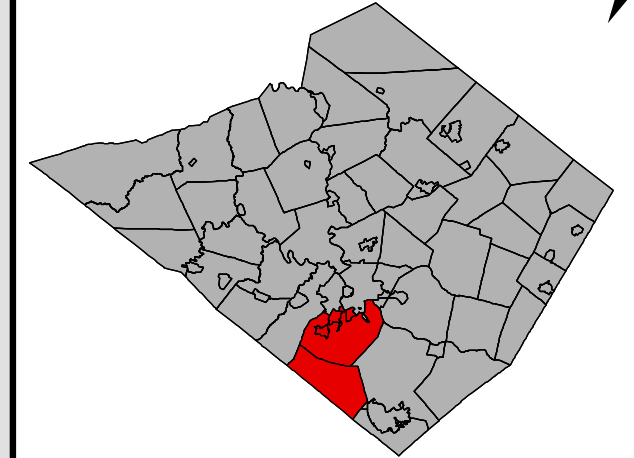
Another regionally significant natural heritage area in the Region is the Schuylkill River. Located in northern Cumru Township, this area supports three sensitive species of concern as well as two state imperiled butterflies: cobweb skipper and dusted skipper.

State ranked natural heritage areas in the Region include Allegheny Creek, Hilltop Road, Little Muddy Creek, Maple Grove Road Farm, and Nolde Forest Environmental Education Center. State ranks have smaller populations or extents, or have generally lower biodiversity scores than Regional ranked areas. These areas apply to maintain the species representation in Pennsylvania.



Nolde Forest Environmental Education Center is a natural heritage area and contains nearly 700 acres of woodlands

Soils



Soil Map Unit Descriptions

AbA*	CmA*	JpB	NhD
AbB*	CwA	JpD	NhF
AnB	CwB	JpF	Qu
AoB	DbB*	LaB*	ReA*
AsB*	DfC*	LaC*	ReB*
AsC*	EdB	LaD	Ro*
AuD	EdD	LbB	ThA
AwD	EhC*	LbD	ToA
BkB*	EhD	LfA	Ua
BkC*	GbD	LmB*	UgB
BkD	Gc*	Me*	UkB
BkF	GnA*	MIB*	UmB
BmB*	GnB*	MmB	UmD
Bo	HeF	MuB*	UpB
BpB*	Ho*	MuC*	UpD
BpC*	JnB*	NaB*	UsD
BpD	JnC*	NaC*	W
BsB	JnD	NaD	WeB
BsD	JnE	NhB	WeD

Legend

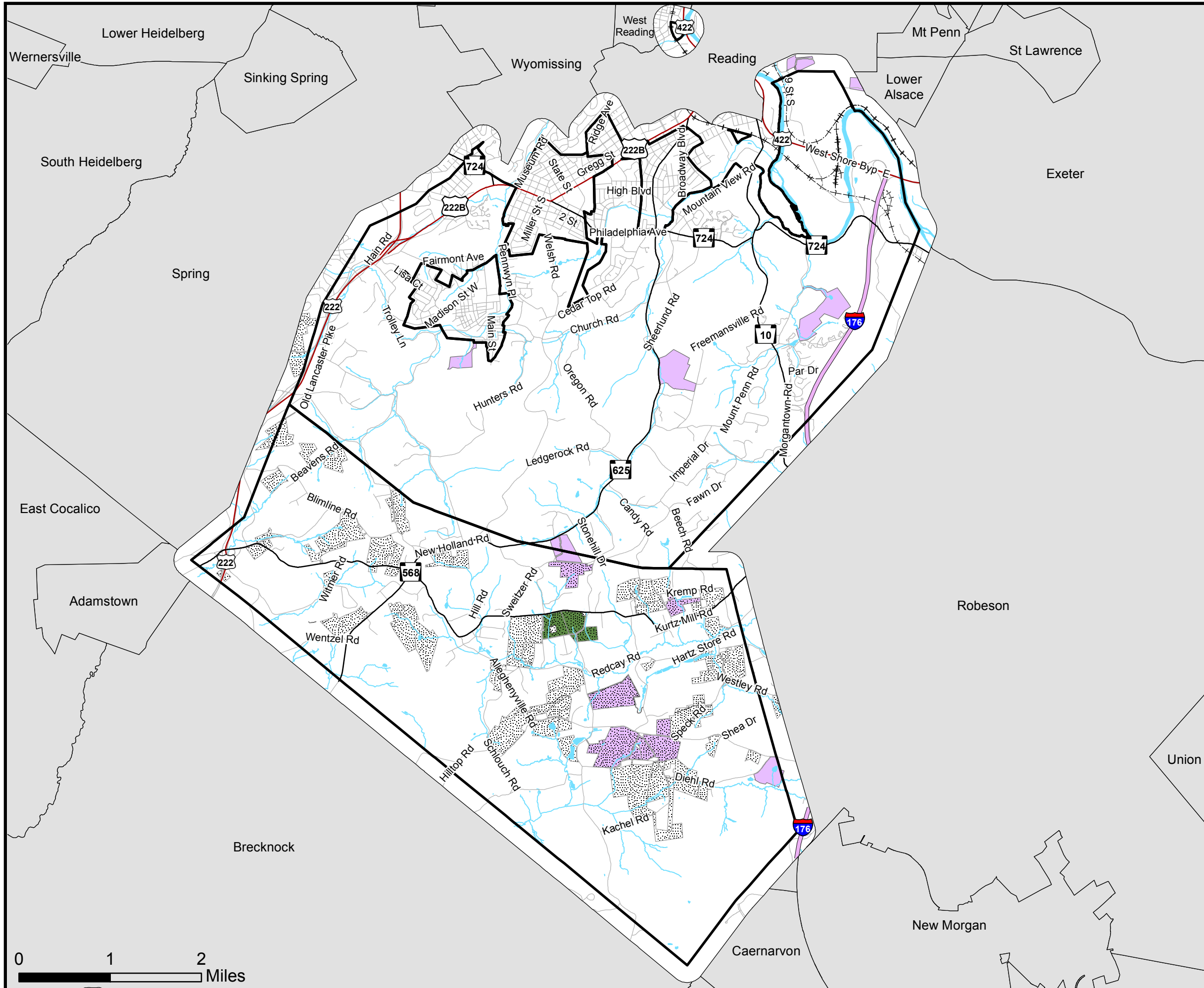
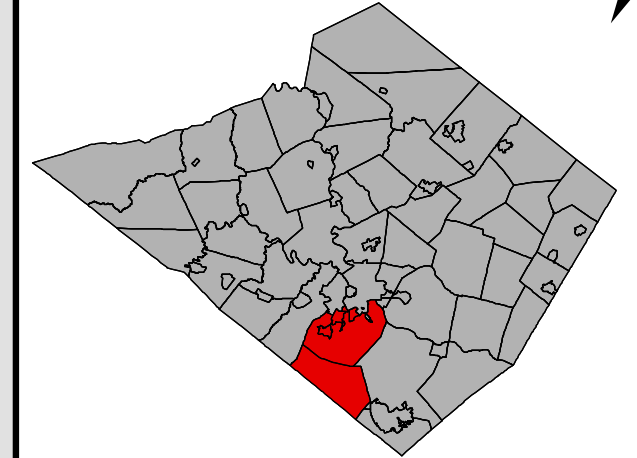
- Poorly Drained Soils
- Roads
- Railroads
- Municipal Boundaries

* Prime Agricultural Soils (Classes 1-3)







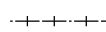

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, USDA NRCS
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Protected Land

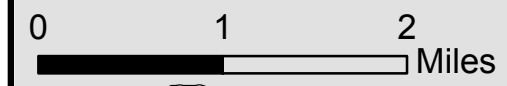


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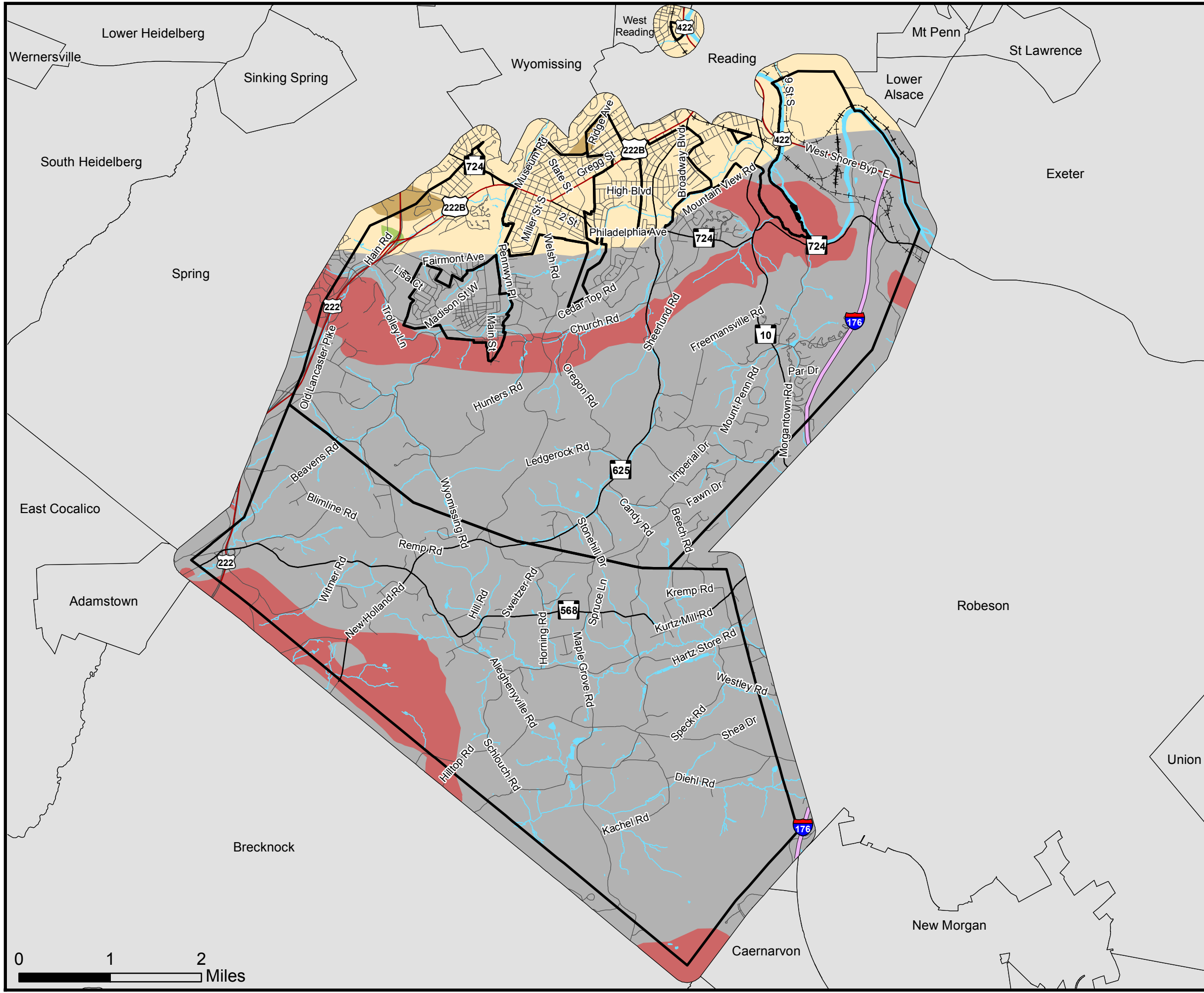
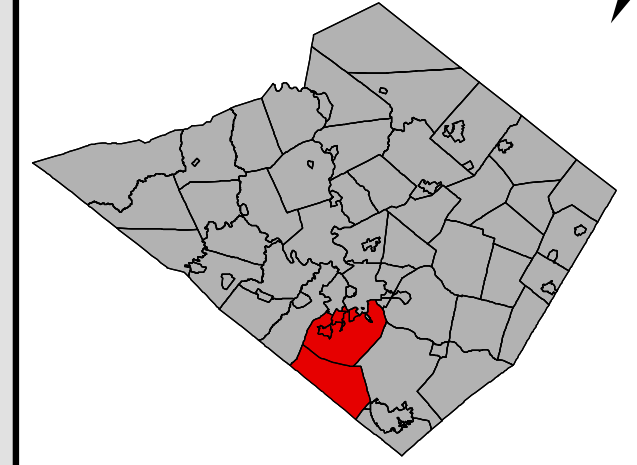
-  Berks County Agricultural Conservation Easement
-  Agricultural Security Area
-  Conservation Easement
-  Water Bodies
-  Streams
-  Roads
-  Railroads
-  Municipal Boundaries

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, Berks Nature, Brecknock Township
 Published by the Berks County Planning Commission

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Geology



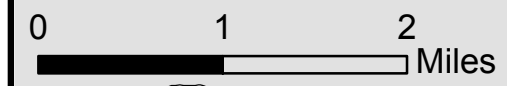
Geologic Period

- Precambrian
- Cambrian
- Ordovician
- Silurian
- Triassic
- Jurassic
- Water Bodies
- Streams
- Roads
- Railroads
- Municipal Boundaries

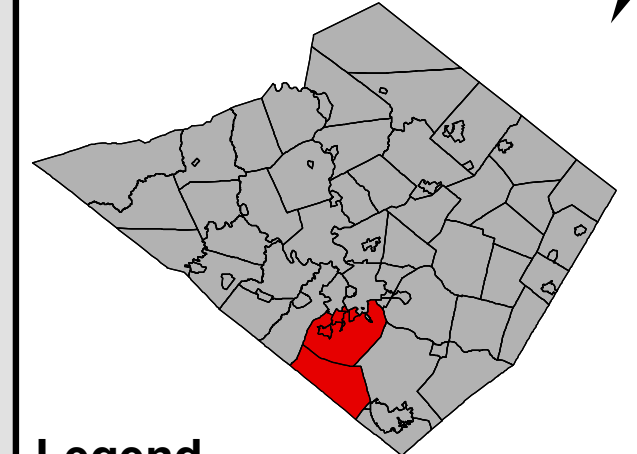
Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, USDA NRCS

Published by the Berks County Planning Commission












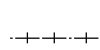

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Natural Resources



Legend

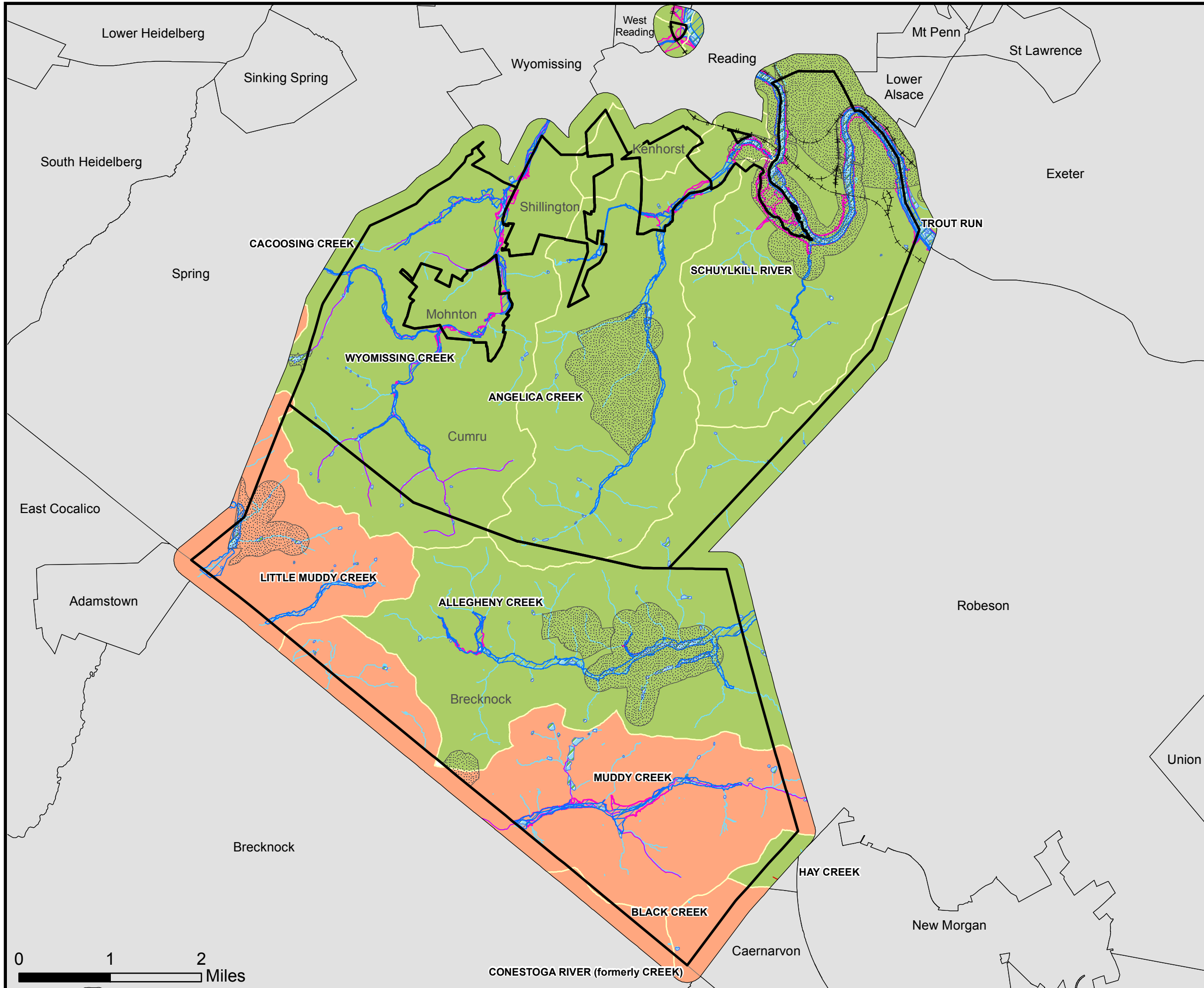
-  Schuylkill Watershed*
-  Conestoga River Watershed**
-  Subwatersheds
-  1% Floodplain
-  0.2% Floodplain
-  Wetlands
-  Natural Heritage Area- Core Habitat
-  Exceptional Value Streams
-  High Quality Streams
-  Water Bodies
-  Streams
-  Railroads
-  Municipal Boundaries

* Drains to Delaware River
** Drains to Susquehanna River

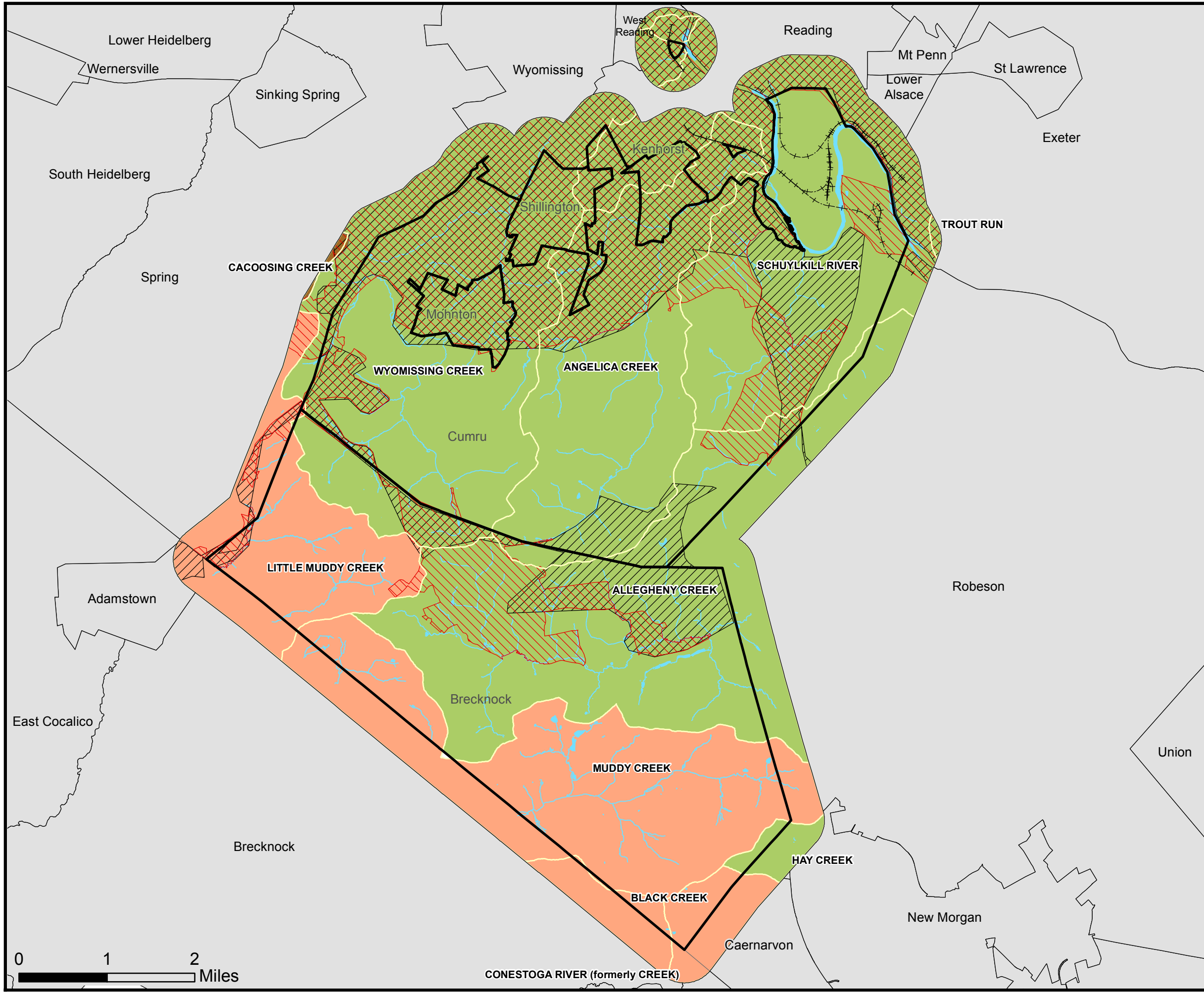
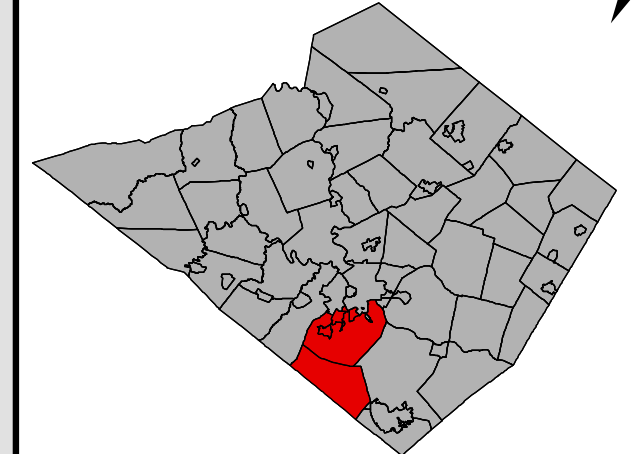
Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, FEMA, Western Pennsylvania Conservancy, SRBC

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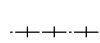

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MS4 Areas



Legend

-  Urbanized Area 2000
-  Urbanized Area 2010
-  Schuylkill Watershed*
-  Conestoga River Watershed**
-  Tulpehocken Creek Watershed*
-  Subwatersheds
-  Water Bodies
-  Streams
-  Railroads
-  Municipal Boundaries

* Drains to Schuylkill River
** Drains to Susquehanna River

Source data: Berks County Planning Commission GIS, Berks County GIS/IS, Berks County Mapping, Berks DES, SRBC, U.S. Census Bureau

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