

## **Chapter VI - Natural Resource Analysis**

### **Regional Setting**

Wayne County is part of several distinct regions from the standpoint of planning. Depending on the matter at hand, it is joined with various contiguous counties. The physical development of the County is, also, very much related to activities and trends within those regional communities, although the regions can differ depending on the issue at hand and that part of the County which is involved.

Most often, Wayne County is viewed, from a marketing perspective, as one of the four Pocono Counties, the others being Carbon, Monroe and Pike. Clearly, this region has much in common from the impacts being felt from the relentless push westward of development from the New York metropolitan area. Wayne, Pike and Monroe are similarly affected by some of these trends, although there are distinct differences that are addressed in Chapter VIII of this Plan.

Indeed, these counties all share many characteristics with Sullivan and Orange Counties in New York and Sussex County, in New Jersey. They are all influenced greatly by growth coming out of the New York City metropolitan region, have the Delaware River in common and share tourism economies. The others, however, are a few years ahead of Wayne in realizing the development impacts from being on the fringe of one the world's largest contiguous urban areas. The Pocono counties have, typically, worked together in addressing economic development issues and promoting tourism, as well as various other issues.

Demographically, Wayne, Pike and Monroe are quite alike and quite different from the remainder of the Commonwealth. They are also frequently served by the same elected representatives at the State and Federal level and all fall within the jurisdiction of the Delaware River Basin Commission. Wayne and Pike are both within the Upper Delaware River basin and this has resulted in close relationships between the two counties and their adjoiners in New York State. Wayne and Pike also share Lake Wallenpaupack and have had cause to cooperate closely with regard to it as well.

A lesser, but still significant, relationship exists with the Scranton/Wilkes-Barre region. Primarily, the links here are commercial and health-related in nature with Scranton area stores and hospitals tending to draw business from Wayne County. These Counties, Lackawanna and Luzerne, share with the Pocono counties and far-removed Schuylkill County, membership in the Northeastern Pennsylvania Alliance (NEPA).

NEPA provides a semi-governmental link with the Scranton/Wilkes-Barre area and there is, too, some sharing of legislators along the western border of the County but the connection is still, primarily, a commercial one. The areas are physically and culturally far apart and typically, have needs and political objectives which contrast sharply with the Poconos as a whole and Wayne County in particular.

**Figure VI-1**



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There are also some connections with Susquehanna County to the West and Delaware and Broome Counties to the north, the northern part of Wayne sharing some characteristics with these. However, the links tend to be quite specific and produce little in the way of general impacts which would define the combined areas as a region. Binghamton influences and the draw of Susquehanna and Hancock as minor shopping areas account for most of the connections. As development marches further westward from New York, Route 17 (now being upgraded to serve as I-86) will become a factor pulling this area eastward in much the same way as the rest of the County now is drawn.

Summarizing, it is what happens in the urban areas to the East that will principally, although not entirely, affect the future development of Wayne County.

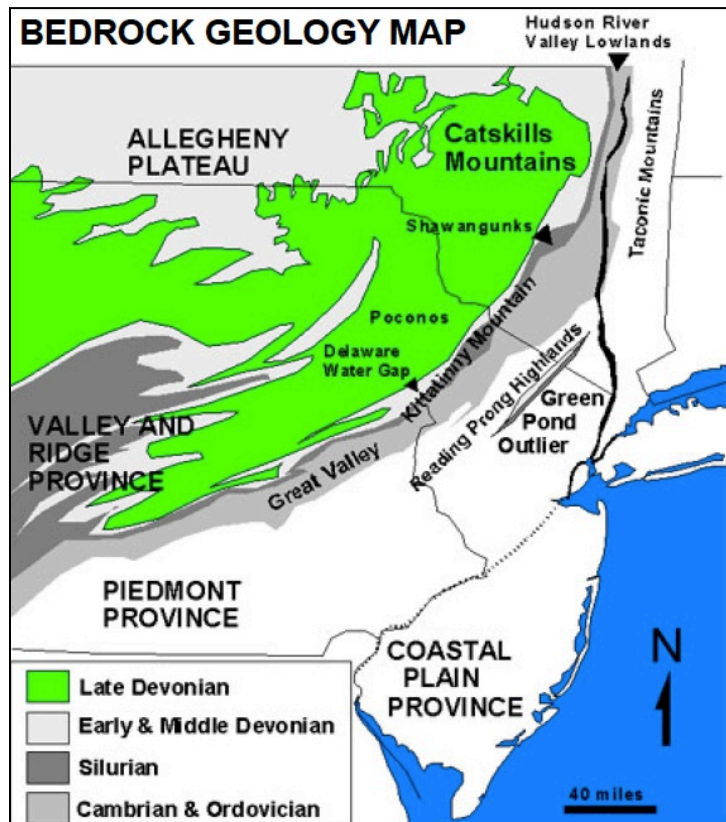
### Geologic History

Wayne County's relief, topography, soils, lakes and streams all were created from bedrock formations and glacial movements that began some 350 million years ago during the Upper or Late Devonian Period (see Figure VI-2). It was then when the Catskill Continental Group, which today covers nearly 95% of Wayne County, was formed. Also known as the Catskill Delta, it constitutes most of the exposed rock in the County.

The Catskill formation is the oldest bedrock in the County. It consists mainly of red to brown sandstones and shales and is the most important source of ground water throughout Wayne County with more wells drilled into this group than any other. The Marcellus Shale layer yields natural gas, and large areas have been leased for this purpose. Development has been taking place in the Susquehanna River watershed with permission of the Susquehanna River Basin Commission and may well occur in that part of the County but is currently prevented in the Delaware River watershed portion of the County by the contrary regulations of the like-governed Delaware River Basin Commission.

The next geologic structural change occurred during the Mississippian Period that took place roughly 310 million years ago. During this period the Mauch Chunk and Pocono formations were created from erosion and weathering of rock formed in the Devonian Period. The Mauch Chunk formation contains red and green shales and some green sandstone, while the Pocono has thick beds of coarse-grained sandstone and conglomerate and some red shale. Both groups harbor large supplies of underground water.

**Figure VI-2**



**Source: U.S. Geological Survey**

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The youngest bedrock in Wayne County was formed some 270 million years ago during the Lower Pennsylvania Period. This formation was created due to the tremendous weight of the large masses of sediment created during the Devonian Period which caused Wayne County's surface to slowly subside. This, in turn, formed a large trough and the extreme northern edge of it can be seen in western Wayne County. It is here, in the trough location, where the youngest rock in the County is located.

The two groups found in the County are the Pottsville and Post Pottsville groups and these consist of coarse sandstone, conglomerate, irregular beds of shale and thin seams of anthracite coal. It was another 260 million years before the surface of Wayne County was again changed into the landscape which we see today. A geologic mapping of the County is available in the *Pennsylvania State Water Plan* and a more thorough discussion of it may be found in the *Wayne County Soil Survey*.

### **Topography**

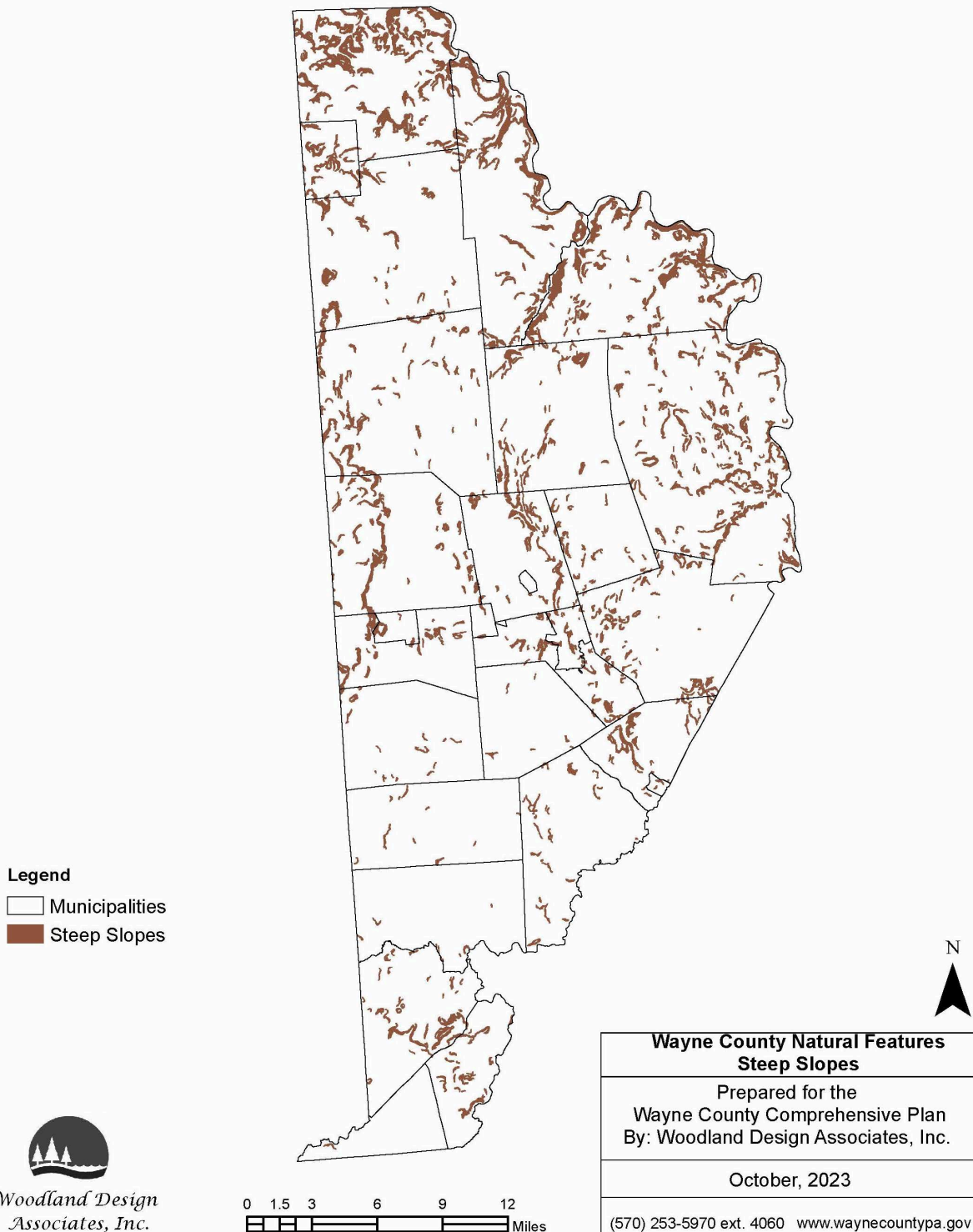
Approximately one million years ago, the Earth experienced a period of glaciation. There were two glacial cycles that covered Wayne County (except Sugarloaf Mountain and Mount Ararat) with the last one occurring during the Wisconsin glacial stage of the Pleistocene Epoch approximately 10,000 to 14,000 years ago. It was during the movement and melting of these glaciers that Wayne County's present relief and topography were largely formed. Some of the outstanding features include the many natural lakes, ponds and wetlands that can be seen throughout the County. Many of these natural lakes exceed 50 feet in depth and serve as groundwater recharge areas.

As the glacier retreated it deposited large masses of rock debris which cover many of the highlands and slopes. The general average elevation of the upland is 1,400 feet above sea level. The highest points in the County are Sugarloaf Mountain at 2,536 feet and Mount Ararat at 2,656 feet above sea level (see topography map excerpt above that depicts Mount Ararat in Preston Township). The lowest elevation is found in Berlin Township by the Delaware River at 680 feet above sea level. Other elevations throughout the County are Hawley at 860 feet, Honesdale at 975 feet, Prompton at 1,087 feet and Waymart at 1,413 feet.

Some of the main streams that flow throughout Wayne County are the Lehigh River, Wallenpaupack and Middle Creeks located in the southern part of the County. Central Wayne County has the East Branch of the Lackawanna River, Dyberry Creek and Lackawaxen River. The north includes the Starrucca Creek and in the northeastern section there are the Delaware tributaries of Shehawken, Equinunk, Little Equinunk, Hollister, Cashes, and Calkins Creeks. The Upper Delaware River of course is the major feature and it drains most of the County with small areas to the West and North in the Susquehanna River Basin.

Mapping of the County's relief and topography is available on the County's Geographic Information System (GIS). A *Steep Slopes* map follows. It depicts slopes of 25% or greater of which there are 31,640 acres in the County (6.6% of the land mass). These slopes are difficult to develop due to their erosion hazards and limitations for on-site sewage disposal. They are found along the Delaware River and its major feeder streams. They are also common in Buckingham, Damascus, Manchester, and Scott Townships and Starrucca Borough; along the Moosic Mountain ridge on the western border of the County and in Dreher and Sterling Townships. Smaller areas of such slopes may be found throughout the County. The extent of these areas is a function of the contour interval used to measure them, but the lands depicted represent the largest contiguous areas of such steep slopes in the County.

## Wayne County Natural Features: Steep Slopes



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### **Soils**

Soils development in Wayne County is a result of the Wisconsin glacial stage. Due to the relatively recent nature of this activity, Wayne County's soils have not fully matured and, therefore, are young, acidic and not noted for good drainage or permeability. A map of *Hydric Soils* (sufficiently wet in the upper part to develop anaerobic conditions during the growing season may be found at the end of this chapter). These soils are scattered throughout the County. They are not especially good for agricultural crops, but can support forests and animal agriculture (e.g., dairy and sheep).

Agricultural soils are divided into eight major classes with Class I and II soils being generally fertile, well drained, easily worked and productive. Wayne County has few areas of Class I and II soils with the majority found along major waterways and floodplains and some of the upland plateaus. Prompton State Park and the Jadwin Dam area currently occupy a large portion of these soils and these are unavailable for production.

The County does have large areas of Class III soils with fair cropland productivity. However, these are difficult to cultivate and require practices such as crop rotation or limited crop varieties. The majority of these soils are located in the Damascus Township area. A map of *Important Farmland Soils* follows. It depicts not only prime farmland (45,957 acres), but also "farmland of statewide importance" (84,039 acres) as defined by the USDA. This valuable farmland is found throughout central and northern Wayne County and especially from Cherry Ridge north. Some such soils are found further south but are less cultivated.

Soils are further classified by series and associations. The following are the names of soils series commonly found in Wayne County, along with a brief description of each. More detailed information on all soils found in the County may be obtained from the updated *Wayne County Agricultural Land Use / Land Cover Study*.

**Arnot** - shallow and somewhat excessively drained to well drained

**Basher** - deep and moderately well drained and somewhat poorly drained; they have a seasonal high water table

**Holly** - deep and poorly drained and very poorly drained; they have a high water table most of the year

**Lordstown** - moderately deep and well drained

**Mardin** - deep and moderately well drained; they have a fragipan and seasonal high water table

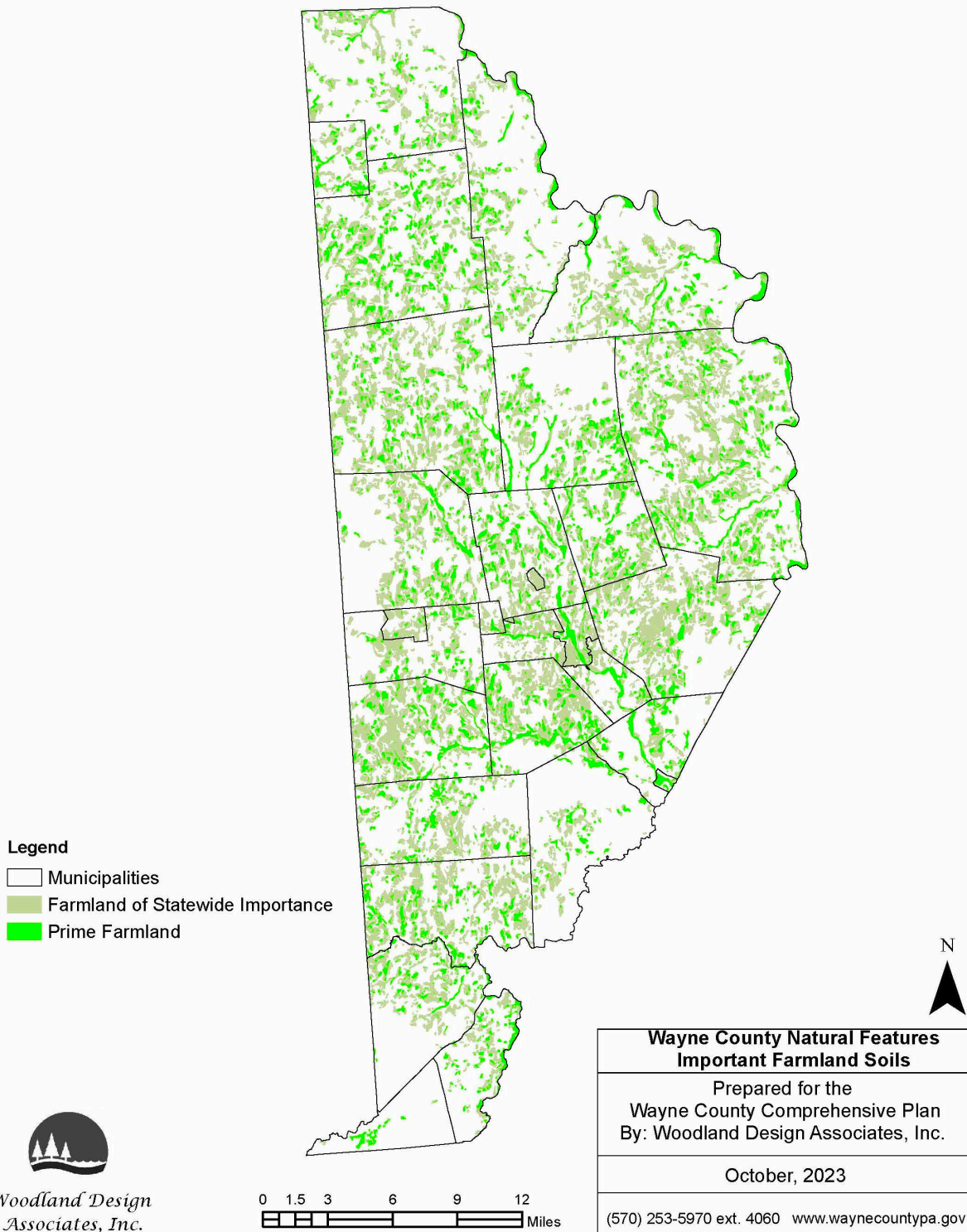
**Morris** - deep and somewhat poorly drained; they have a fragipan and seasonal high water table

**Oquaga** - moderately deep and well drained

**Swartswood** - deep and are well drained and moderately well drained; they have a fragipan and seasonal high water table



## Wayne County Natural Features: Important Farmland Soils



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**Volusia** - deep and somewhat poorly drained; with fragipan and seasonal high water table

**Wellsboro** - deep and moderately well drained and somewhat poorly drained; they have a fragipan and seasonal high water table

**Wyoming** - deep and somewhat excessively drained

Most of Wayne County, with the exception of land along the Delaware River, consists of Morris-Wellsboro and Oquaga soils groups. The limiting characteristics are seasonal high water table, slow permeability, shallow depth and steep slopes.

Hydric soils are a primary limitation for development, as well as agriculture (see *Hydric Soils* map following). They account for 31,984 acres of land or roughly 6.7% of the County.

All these various soil groups can have restrictions for on-lot sewage systems. Generalized mapping is provided in the *Wayne County Soil Survey* along with analysis based on national criteria which may or may not be applicable to Wayne County.

The *Soil Survey*, for example, takes no account of Pennsylvania standards for on-site sewage disposal or new technologies, leading it to classify almost all of the County unsuitable for such systems based on seasonal high water table, which is only a completely disqualifying characteristic if within 10-20 inches of the surface. The 1975 *Sewage Facilities Plan Update* for the County consolidated these maps and classified them by suitability for on lot disposal in terms of then-existing criteria.

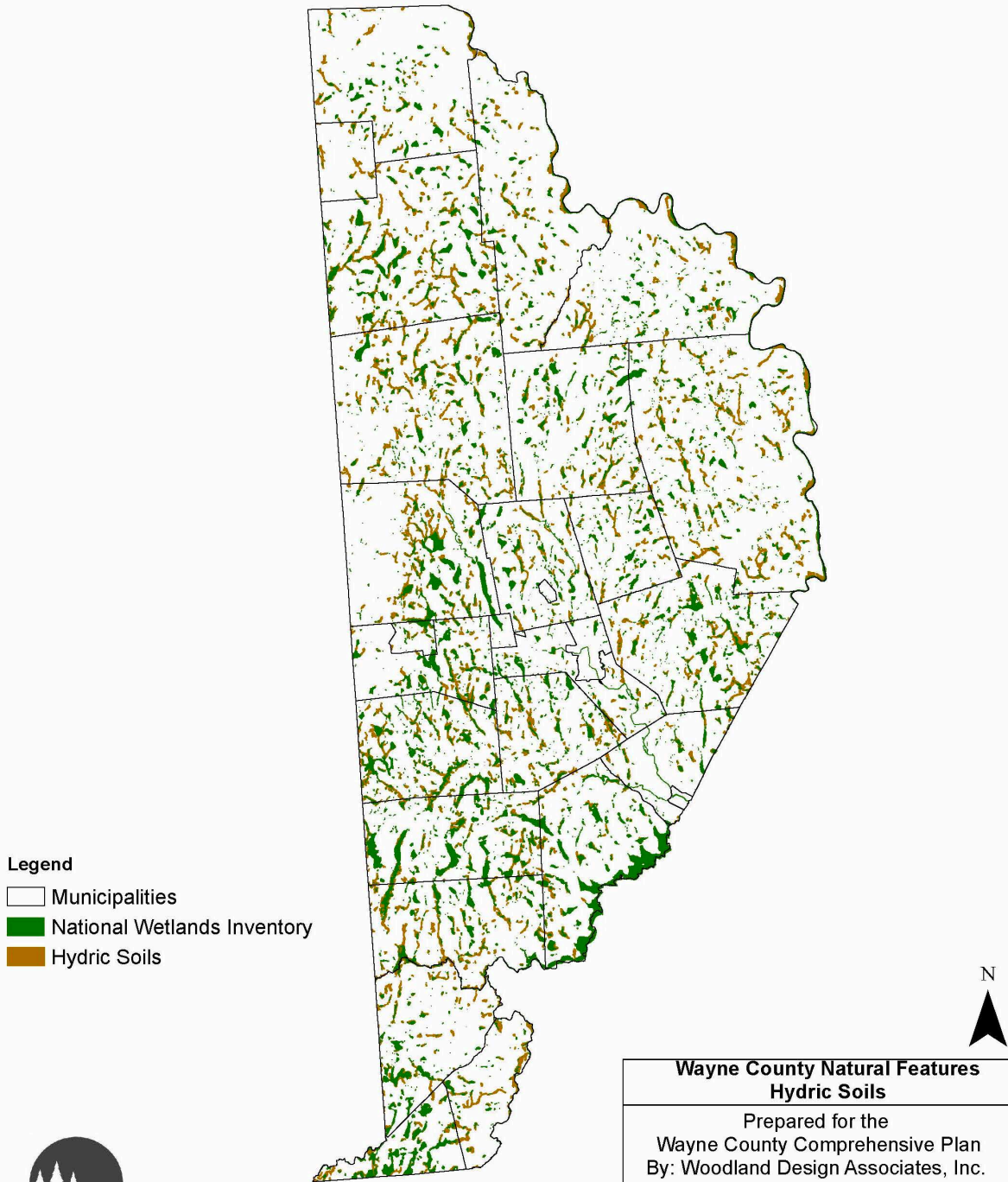
Soils are also, for more general analysis purposes, classified into soil associations by the Soil Conservation Service and there are seven of these. The following is a description of each association.

**Oquaga-Wellsboro-Arnot** - Some 28% of Wayne County is covered by this soil association which make-up includes 30% Oquaga, 20% Wellsboro, 15% Arnot and 35% minor soils. These soils largely benefit woodlands, being too steep and stony for pasture or cropland use. They also have potential for development of wildlife habitat and recreation use.

**Morris-Wellsboro** - Some 26% of Wayne County is covered by this association the make-up of which includes 40% Morris, 32% Wellsboro and 28% minor soils. The soils are dominantly nearly level and gently sloping. Much of this association is used for farmland and dairying, in particular. The soil has medium to high potential for cropland in cleared areas. There is a moderately high potential for woodlands. Non-farm uses are limited by seasonal high water tables, slow permeability and stoney surfaces found in some areas.

**Wellsboro-Morris-Oquaga** - Some 17% of Wayne County is covered by this association which make-up includes 36% Wellsboro, 28% Morris, 18% Oquaga and 18% minor soils. There is, in this association, an equal distribution of woodland and farmland. There is a high potential for crop and pasture land if cleared. Noncleared areas typically are stony surfaced and there is limited use for crop and pasture land but these soils are good for woodlands. These areas are also good for wildlife and recreation uses.

## Wayne County Natural Features: Hydric Soils



**Legend**

- Municipalities
- National Wetlands Inventory
- Hydric Soils



Woodland Design  
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Miles



**Wayne County Natural Features  
Hydric Soils**

Prepared for the  
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October, 2023

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**Mardin-Volusia-Lordstown** - Some 11% of Wayne County is covered by this association which make-up includes 40% Mardin, 30% Volusia, 20% Lordstown and 10% minor soils. This association is suitable for wildlife, recreation, cultivated crops in areas cleared of trees and stones and pasture. The area has high potential for woodlands.

**Holly-Basher-Wyoming** - About 10% of Wayne County is covered by this association which make-up includes 15% Holly, 12% Basher, 10% Wyoming and 63% minor soils. The soils in this association have high potential for cropland and pasture if not flooded. Non-farm uses are limited by high water tables. There is potential for wildlife and recreation uses.

**Lordstown-Mardin-Volusia** - Some 6% of Wayne County is covered by this association which make-up includes 40% Lordstown, 35% Mardin, 10% Volusia and 15% minor soils. The soils in this association have only medium potential for cropland and pasture and limited to non-farm uses if cleared because of bedrock depth and seasonal high water tables. There is high potential for woodland, wildlife and recreation uses, however.

**Mardin-Swartswood-Volusia** - Some 2% of Wayne County is covered by this association which make-up includes 25% Mardin, 30% Swartswood, 20% Volusia and 25% other soils. The soils in this association have a low potential for farm uses and limited non-farm uses due to stony surfaces and seasonal high water tables. There is high potential for woodland, wildlife and recreation uses.

These various associations are mapped in the *Wayne County Soil Survey*.

### **Hydrology**

Wayne County is blessed with an abundance of streams, ponds and lakes and with water being the most important commodity in a functioning ecosystem, the County's hydrology is perhaps, its most natural important feature. The County includes 16,230 acres of water, some 3.4% of the County land mass. The two largest water areas are the Delaware River and Lake Wallenpaupack. Both areas provide vast amounts of recreation and Lake Wallenpaupack is the largest recreational attraction in the Poconos.

The Lacawac Sanctuary is also located near Lake Wallenpaupack and covers more than 632 acres including the 52 acre Lake Lacawac, which is an unpolluted glacial lake designated as a National Natural Landmark (depicted to the right). The majority of the County's water resources remain unpolluted and are a major attraction to anglers, campers and second-home and seasonal visitors. Many of these lakes and ponds are, however, small and shallow, limiting self-cleansing capabilities. Along with these natural lakes there are, also, man-made lakes dotted throughout the County which contain impermeable soils.



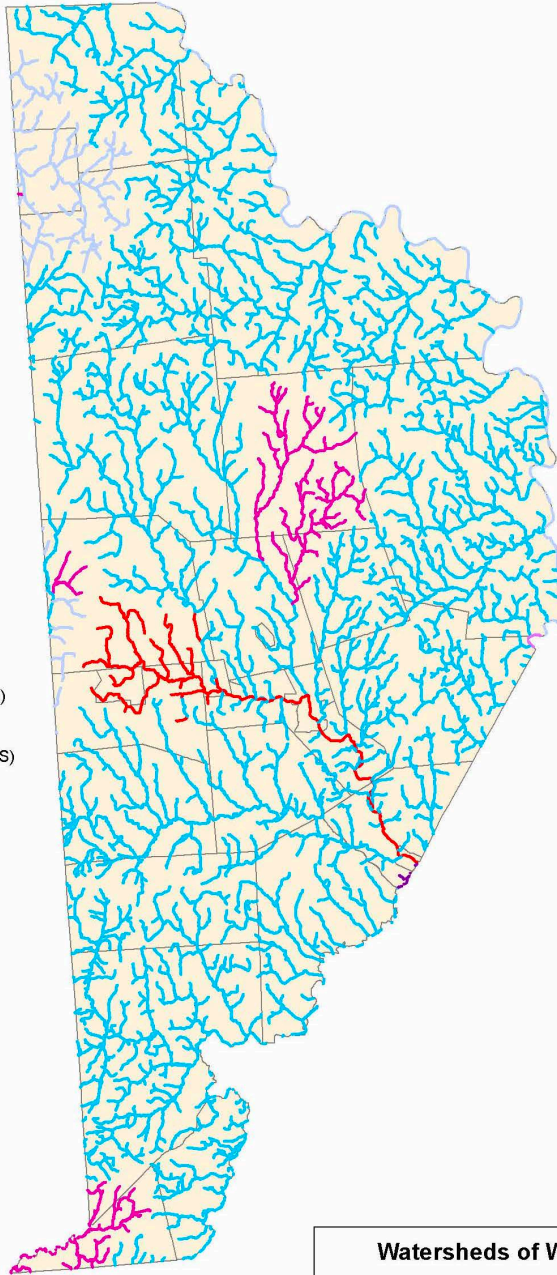
These soils are excellent liners but they hold pollutants and effluents as well. A wide variety of fish species populate the County's lakes and streams. One of the most popular game fish is the trout and the West Branch of the Delaware River enjoys a national reputation for fly fishing for this species. Largemouth, Smallmouth and Striped Bass also are a popular game fish.

## Watersheds of Wayne County

### Legend

#### Designated Use Streams

- CWF(COLD WATER FISHES)
- EV(EXCEPTIONAL VALUE)
- HQ-CWF(HIGH QUALITY-COLD WATER FISHES)
- HQ-TSF(HIGH QUALITY-TROUT STOCKING)
- HQ-WWF(HIGH QUALITY-WARM WATER FISHES)
- WWF(WARM WATER FISHES)
- Wild Trout Reproduction
- Municipalities



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Miles

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Other species of fish found in Wayne County waters include Muskellunge, Walleye, Pickerel, Pike, Shad, Carp, Catfish, Crappie, Rock Bass, Sunfish, and Perch. Clean waters and a stocking program conducted by the Pennsylvania Fish Commission result in excellent fishing throughout the County. The Pennsylvania Fish Commission may, indeed, have more public investment in water access areas, commission stocked and operated lakes, ponds and streams as well as a hatchery, within Wayne County than any other county in the Commonwealth.

Another important aspect of these lakes, ponds and streams is the attraction they offer for recreational visitors and second-home owners. Land along water, such as the Delaware River, is often more appealing and results in higher prices. This natural feature, therefore, is very much an economic asset which must be conserved. The increased development of areas adjacent to these water bodies will help the County capitalize on this economic value, but care must be taken to not destroy the resource through such use.

### **Forests**

Wayne County is blessed with an abundance of forests covering over 65% of the land area. The forest consists of second, third and fourth growth trees. The woodlands of Wayne County are 33% maple-beech-birch forest, 24% oak-hickory forest, 17% elm-ash-red maple forest, 16% aspen-birch forest and 10% white pine forest. The large variety of species found in the County contributes to spectacular scenery and a diverse wood products industry.

Lumbering was an extremely important industry in Wayne County during the 1920's and prior and resulted in extensive cutting. As a result there is little first growth found throughout the County. Few, if any, such areas remain today. Woodlands play a critical role in erosion control as well as maintaining good air quality. They constitute both an environmental and economic resource. Modern timber harvesting, which has become more and more mechanized, continues to play an important role in maintaining the health of the resource.

### **Natural Areas and Wildlife**

The natural areas of Wayne County provide exceptional habitat for a variety of wildlife and preserve important species of both animals and plants that are sometimes rare. A Natural Resources Inventory of Wayne County was conducted in 1991 by The Nature Conservancy and identified several of these natural areas. It is recommended this study be updated to reflect changes in conditions that may have taken place since the original inventory was conducted.

There is an abundance of nongame and large and small game wildlife found throughout the County. Nongame animals include a large variety of songbirds, reptiles, amphibians and small mammals. Other species of wildlife found in Wayne County include large game animals such as the white tailed deer and the black bear. Black bears largely inhabit the woodland areas. However, with increased development the bears are experiencing much closer contact with humans.

The white tailed deer population continues to increase and is now at a point where in many instances is clearly a pest. It may be appropriate for the Game Commission to increase the annual harvest to address this problem. Small game hunting animals such as snowshoe hare, cottontail rabbit, gray squirrel, wild

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turkeys, ruffed grouse, ring-necked pheasant and woodcock are plentiful. They can be found on farmland, in forested areas and along the waterways.

Waterfowl such as Canada geese, wood ducks, black ducks and mallards inhabit the many ponds, lakes and streams in the County and American Bald Eagles and osprey are also common. Fur bearing animals such as beaver, muskrat, fox and raccoon make trapping a popular form of recreation. Otters are also present in the area. Aided by Pennsylvania Game Commission stocking programs, wildlife is everywhere and the County is a popular attraction for hunters, which contributes to much tourism.

The Pennsylvania Game Commission manages and maintains 20,806 acres in Wayne County and combined with numerous rod and gun clubs make the County a major hunting and fishing area. This is another important economic resource.

### **Scenery**

Pennsylvania designated [US Route 6](#) a State Heritage Corridor in 2005 and, as such, is part of the Pennsylvania Heritage Areas Program. The Pennsylvania Route 6 Heritage Corridor stretches 400 miles from Crawford County on the Ohio border to Pike County on the New York border. It promotes Pennsylvania Route 6 as a destination in itself and encourages visitors to follow it and discover and explore the great wealth of opportunities and experiences that can be found in the many communities located along US Route 6 in Pennsylvania. Route 6 is also the principal corridor for Bike Route Y, officially designated by PennDOT.

There are also numerous scenic spots and routes located throughout the County. Also, Route 17 between Hancock and Deposit, New York is a nationally recognized Scenic Highway and most of that scenery is Wayne County land. The Upper Delaware River valley, however, contains no continuous highway within Pennsylvania that is parallel to the river to offer any scenic views. State Route 1016 offers only limited view of the Delaware but does have other scenic qualities.

Route 191 offers a similar situation. There are also access areas along the river from major bridges that offer some views. However, once again, there is a New York State highway, Route 97, which does parallel the River and offers spectacular views, all of which, from Narrowsburg north, are of Wayne County. It is designated as the *Upper Delaware Scenic Byway*.

Some of the most popular scenic attractions are the rail excursions operated over the Stourbridge Line. Throughout the year residents and visitors are provided the opportunity to ride the train and view the Lackawaxen River and other areas as it travels from Honesdale to Hawley and the river valley, as a result, has gained considerable common recognition as a scenic area.

Another scenic train excursion, Steamtown, runs trains through Gouldsboro. Other scenic routes include Routes 170 and 670 traveling towards Mount Pleasant plus Route 191 above Equinunk. Route 247 is another in Northern Wayne which offers remarkable scenery and Routes 196 and 296 also present good views in both Southern and Northern Wayne County.

There are numerous other small routes and highways throughout Wayne County, for biking, walking and riding, that offer scenic and historical viewing for both residents and visitors. During the Fall Foliage periods



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these areas present outstanding beauty that attracts much tourism and as an economic resource this scenery should be promoted and conserved. Special natural resources include Lake Lacawac, the Browning Beaver Meadow and a wetland bog located near Lake Ariel on Route 191, all of which have been preserved as sanctuaries through the efforts of local foundations.

The Upper Delaware Scenic and Recreational River (discussed in detail in the separately published Wayne County Recreation Plan), despite the lack of a major highway such Route 97 along its Pennsylvania length, also provides numerous outstanding scenic sites along Route 191 and the several secondary river roads north and south of it. These include views from multiple boating and fishing accesses, the one at Tammany Flats across the river from Callicoon, New York, being a prime example.