



Rapid Watershed Assessment Conococheague-Opequon Watershed

Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best actions to achieve their goals.



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Preface

The Natural Resources Conservation Service (NRCS) is initiating rapid watershed assessments in order to increase the speed and efficiency generating resource information to guide conservation implementation, as well as the speed and efficiency of putting it into the hands of local decision makers. While these rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide a foundation for watershed studies or area planning. In addition, the assessments provide the benefits of NRCS locally-led planning for resource conservation and conservation program implementation in less time and at a reduced cost than more complex studies.

Rapid watershed assessments will be valuable for Farm Bill program delivery, and provide useful information for county, watershed and regional planners. These assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments can help landowners and local leaders set priorities and determine the best actions to achieve their goals.

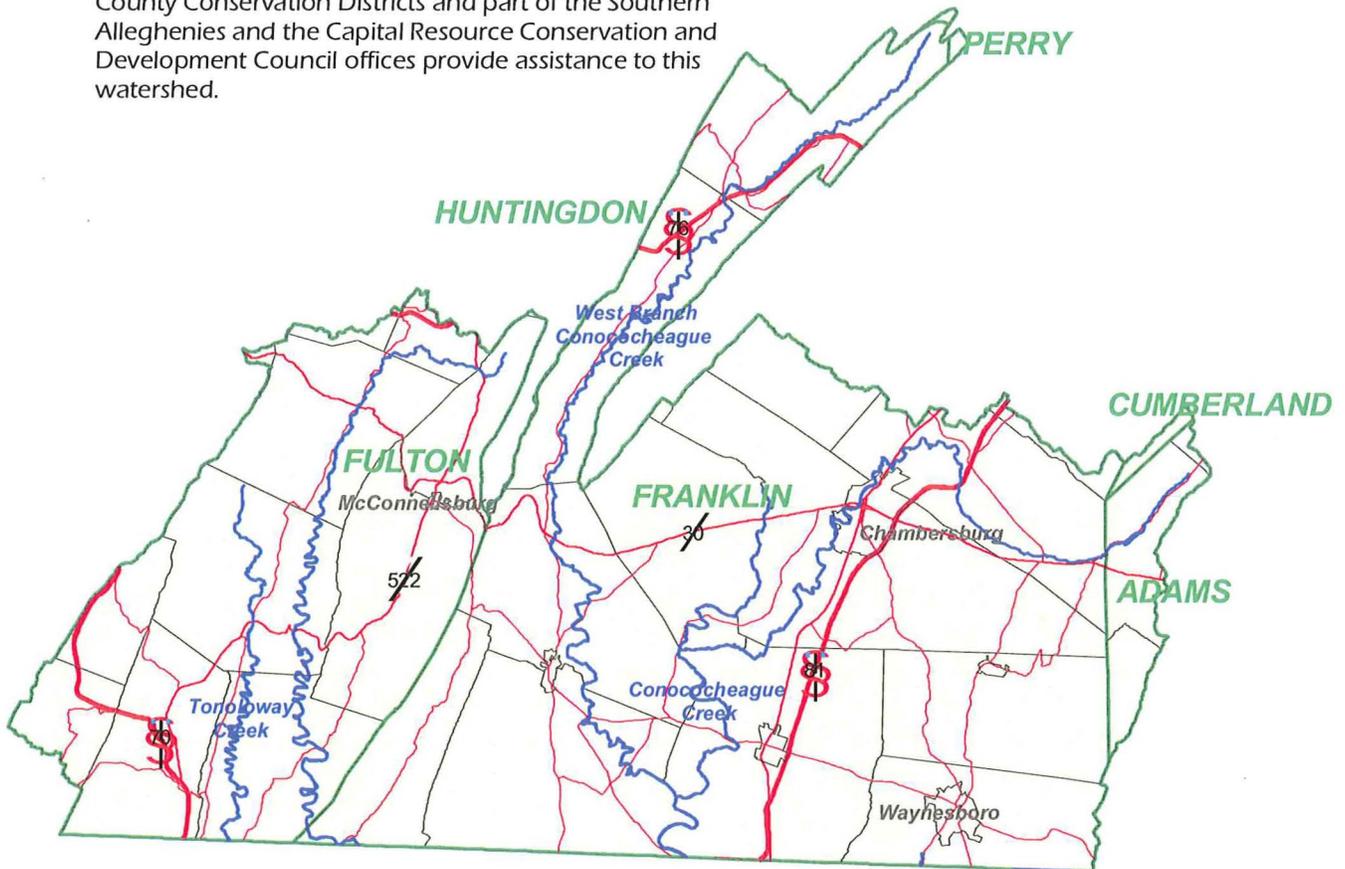
To produce the assessments, quantitative and qualitative data is collected and organized to create a watershed profile using Geographic Information System (GIS) technology. The data is analyzed to allow resource concerns and conditions to become apparent, and to generate maps and information to help people make better decisions about conservation needs and programs.

/s/ Craig R. Derickson
Pennsylvania State Conservationist



Introduction

The Conococheague-Opequon Watershed covers area in four states - Pennsylvania, Maryland, Virginia, and West Virginia. The watershed in Pennsylvania is located in South Central Pennsylvania in portions of Adams, Cumberland, Franklin, Fulton, and Perry Counties and very small area of Huntingdon County. In PA, the watershed is 588,189 acres in size, of which almost 242,000 acres is farmland. Six Service Centers of the Natural Resources Conservation Service, six County Conservation Districts and part of the Southern Alleghenies and the Capital Resource Conservation and Development Council offices provide assistance to this watershed.



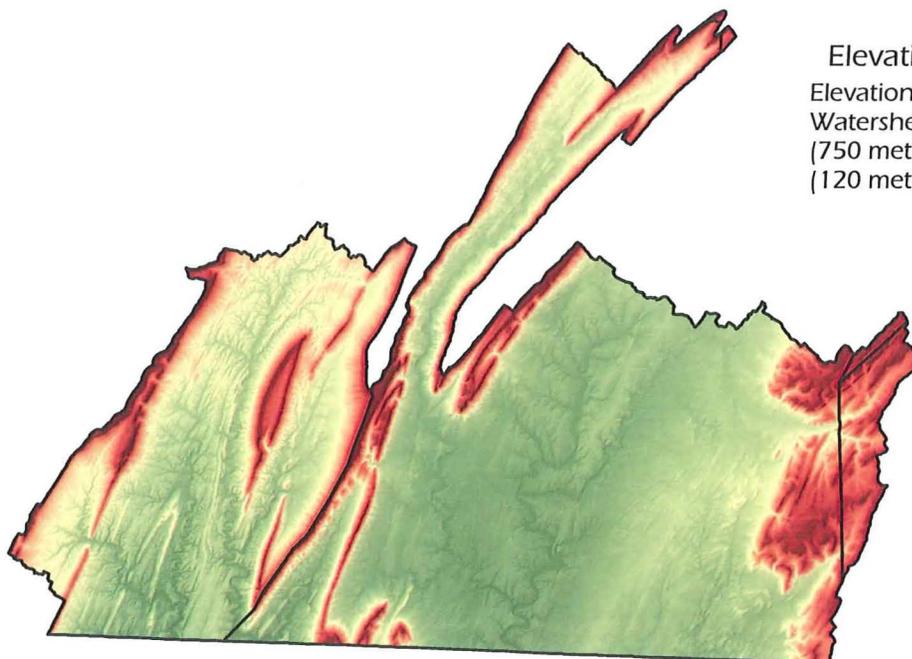
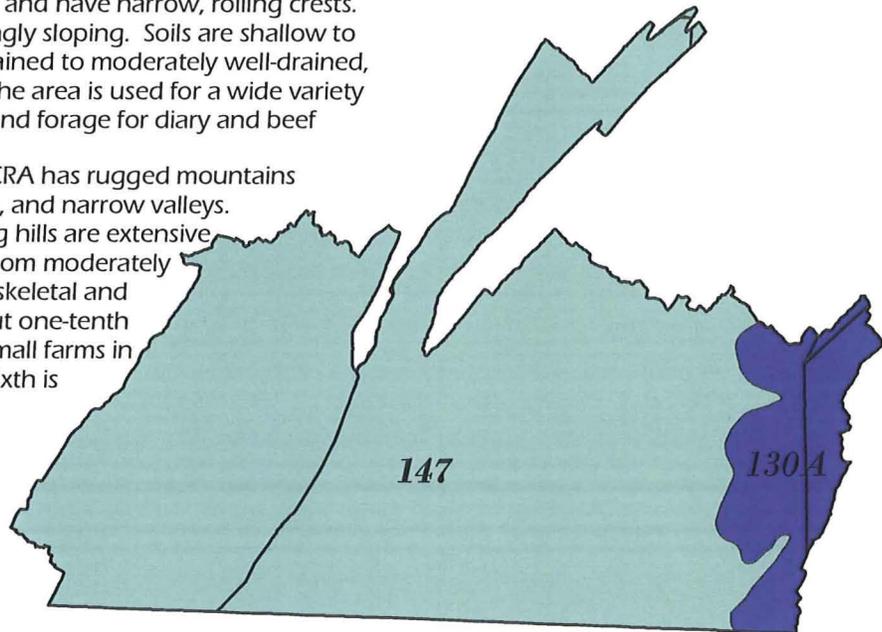
	Acres in HUC	% Acres of HUC
Huntingdon	29	-
Perry	711	.1
Cumberland	1520	.3
Adams	17,619	3.0
Fulton	178,318	30.3
Franklin	389,990	66.3



Common Resource Area (CRA) ¹

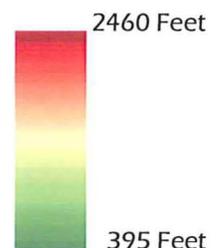
147 - Northern Appalachian Ridges and Valleys: This CRA is a folded and faulted area of parallel ridges and valleys. The ridges are strongly sloping to extremely steep and have narrow, rolling crests. The valleys are mainly level to strongly sloping. Soils are shallow to very deep, generally excessively drained to moderately well-drained, and loamy or clayey. Cropland in the area is used for a wide variety of crops, mainly corn, small grain, and forage for dairy and beef cattle.

130A - Northern Blue Ridge: This CRA has rugged mountains that have steep slopes, sharp crests, and narrow valleys. Broad valleys and basins and rolling hills are extensive throughout the area. Soils range from moderately deep to very deep and from oamy-skeletal and sandy-skeletal to clayey. Only about one-tenth of the area is cropland mainly on small farms in valleys and coves, and about one-sixth is pasture.



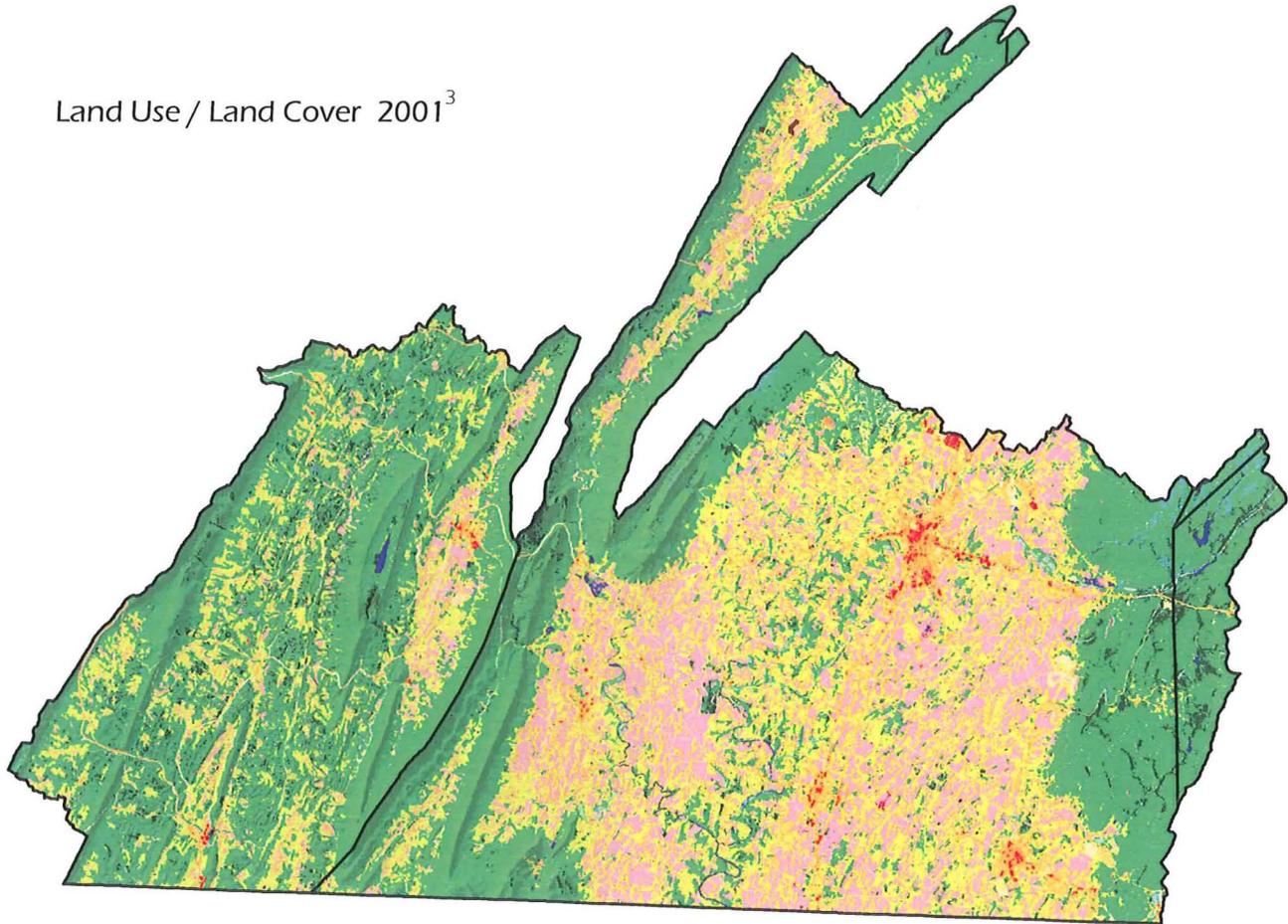
Elevation ²

Elevation in the Conococheague-Opequon Watershed ranges from 2460 feet (750 meters) at it's high point to 395 feet (120 meters) at a low point.

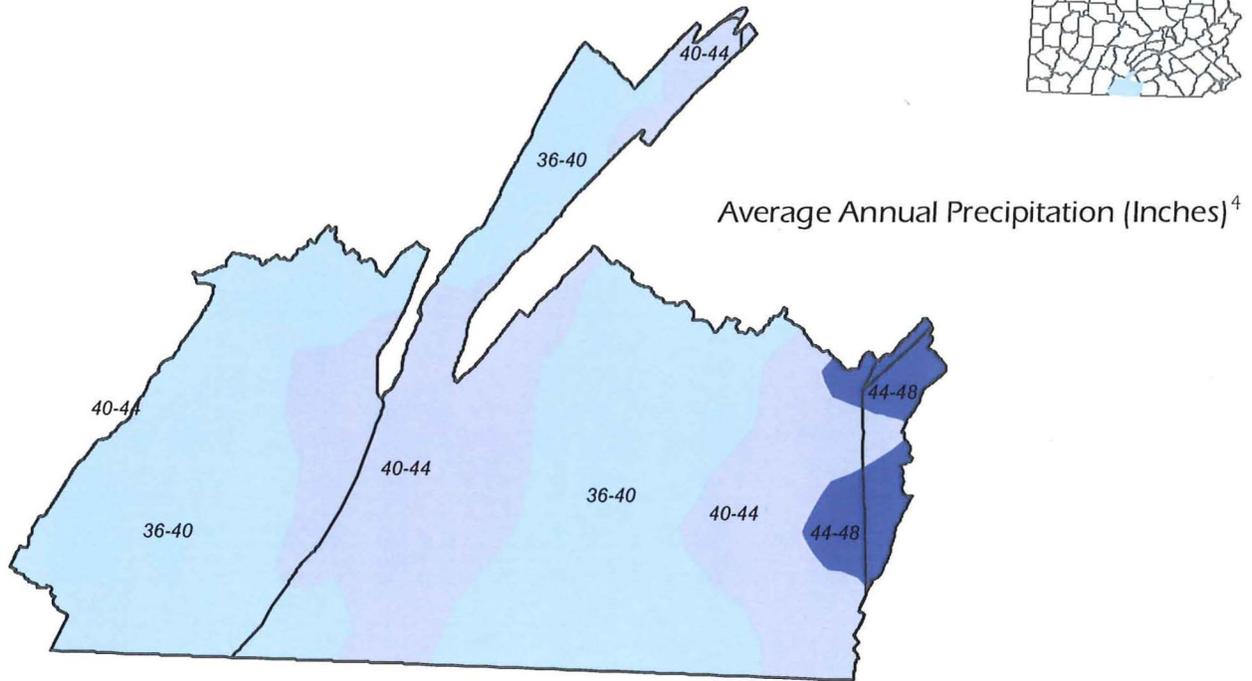




Land Use / Land Cover 2001³



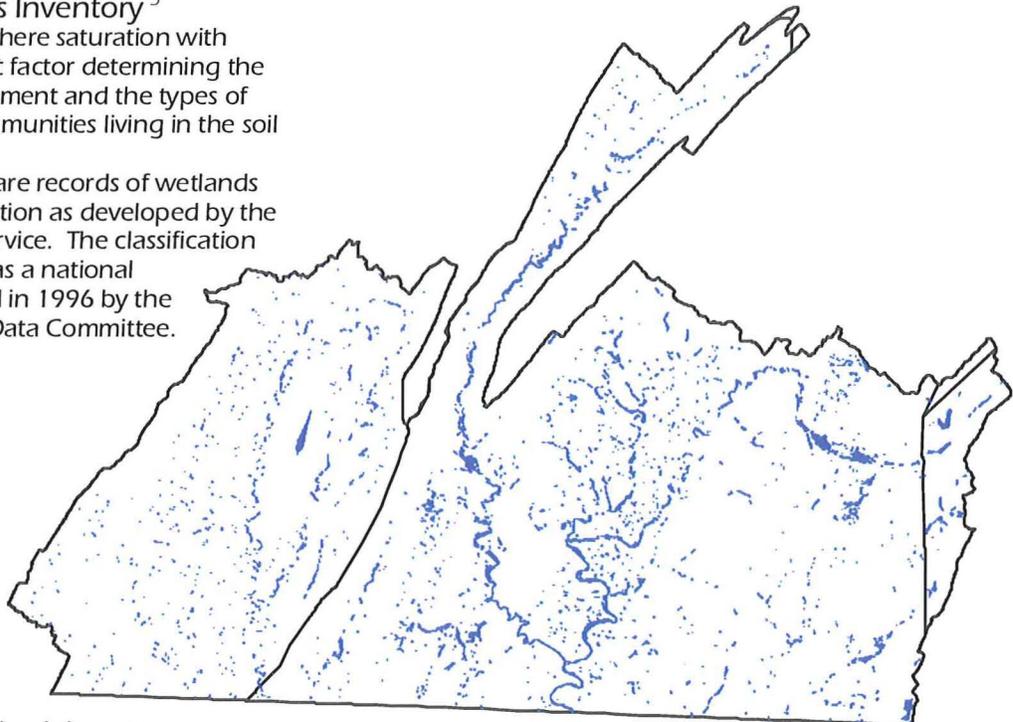
	Acres	Percent
 Water	1900.3	.3
 Developed, Open Space	34,619.3	5.9
 Developed, Low Intensity	20,175.9	3.4
 Developed, Medium Intensity	4064.3	.7
 Developed, High Intensity	1316.5	.2
 Barren Land (Rock, Sand, Clay)	160.6	-
 Deciduous Forest	252,015.0	43.0
 Evergreen Forest	17,344.0	3.0
 Mixed Forest	10,245.9	1.8
 Pasture / Hay	130,902.3	22.4
 Cultivated Crops	110,799.6	18.9
 Woody Wetlands	2197.8	.4
 Emergent Herbaceous Wetlands	881.5	-
 County Boundary		



National Wetlands Inventory⁵

Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface.

NWI digital data files are records of wetlands location and classification as developed by the U.S. Fish & Wildlife Service. The classification system was adopted as a national classification standard in 1996 by the Federal Geographic Data Committee.



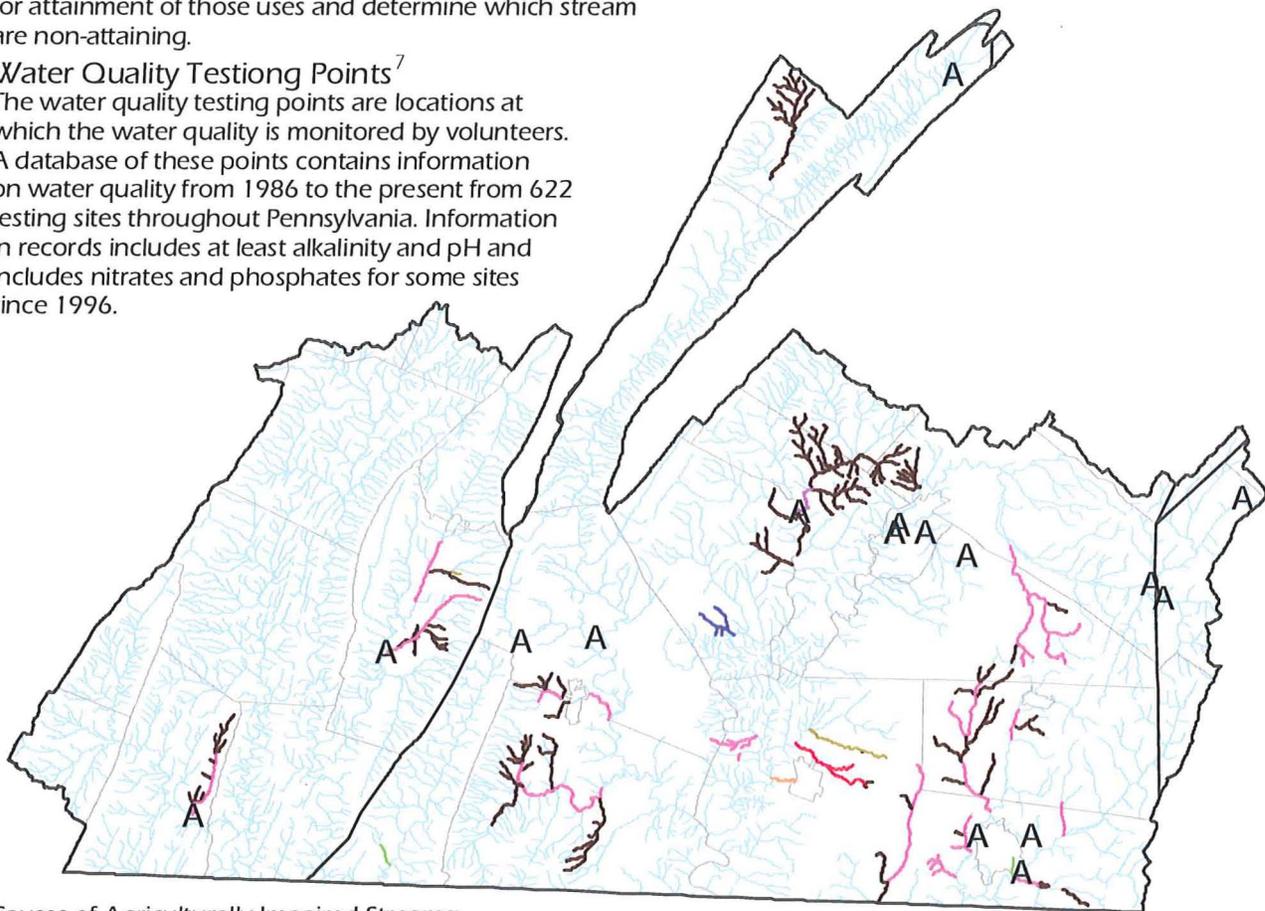


Impaired Streams ⁶

The Streams Integrated List (2006) represents stream assessments in an integrated format for the Clean Water Act Section 305(b) reporting and Section 303(d) listing. PA Department of Environmental Protection protects four stream water uses: aquatic life, fish consumption, potable water supply, and recreation. The 305(b) layers represents stream segments that have been evaluated for attainment of those uses and determine which stream are non-attaining.

Water Quality Testing Points ⁷

The water quality testing points are locations at which the water quality is monitored by volunteers. A database of these points contains information on water quality from 1986 to the present from 622 testing sites throughout Pennsylvania. Information in records includes at least alkalinity and pH and includes nitrates and phosphates for some sites since 1996.

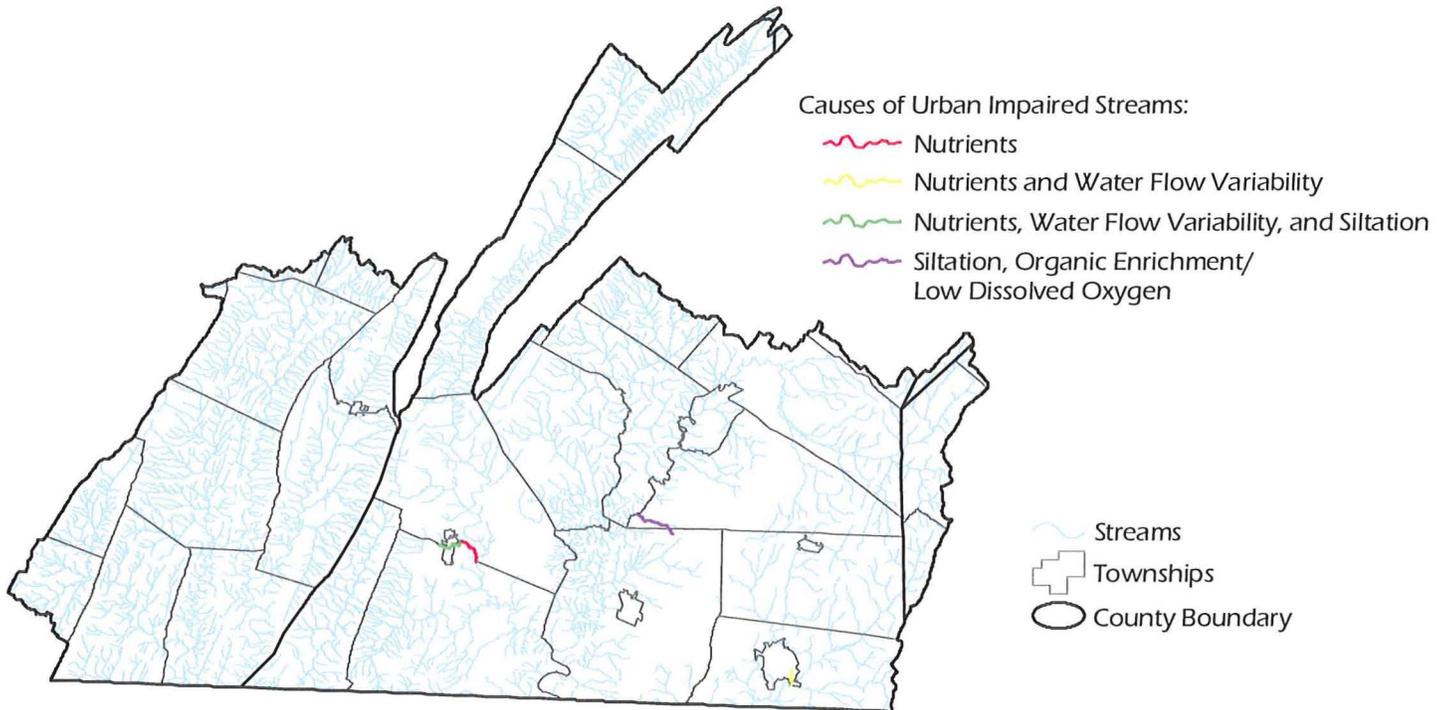


Causes of Agriculturally Impaired Streams:

-  Nutrients
-  Nutrients and Siltation
-  Siltation, Organic Enrichment / Low Dissolved Oxygen, Other Habitat Alterations, Taste & Odor, and Noxious Aquatic Plants
-  Siltation
-  Siltation, Organic Enrichment / Low Dissolved Oxygen, and Other Habitat Alterations
-  Siltation and Other Habitat Alterations
-  Siltation and Turbidity
-  Water Flow Variability

-  Water Quality Testing Points
-  Streams
-  Townships
-  County Boundary

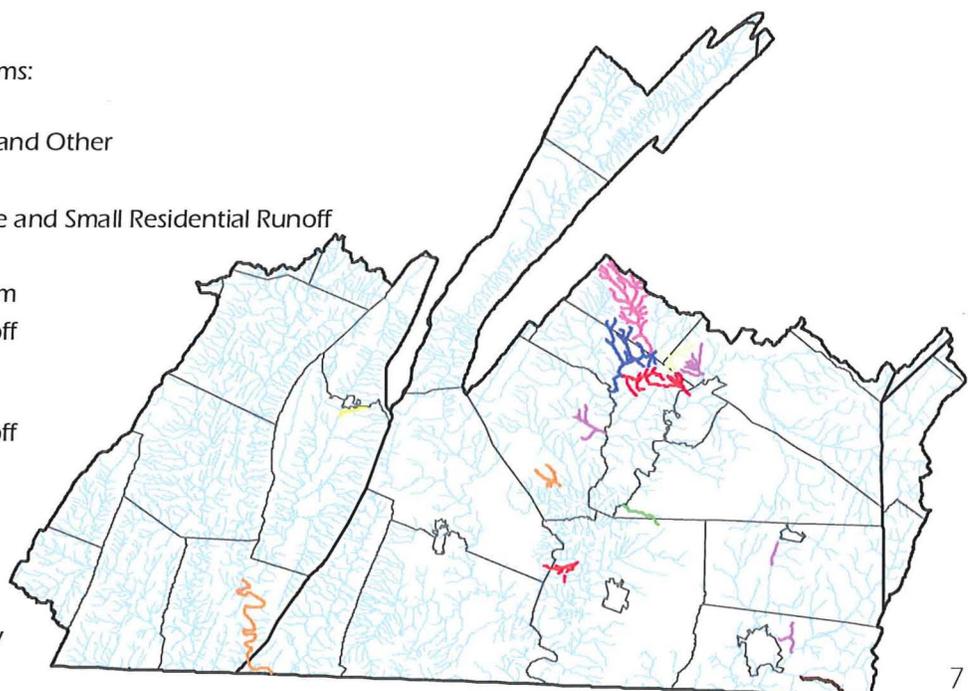
Conococheague-Opequon Watershed



Other Sources of Impaired Streams:

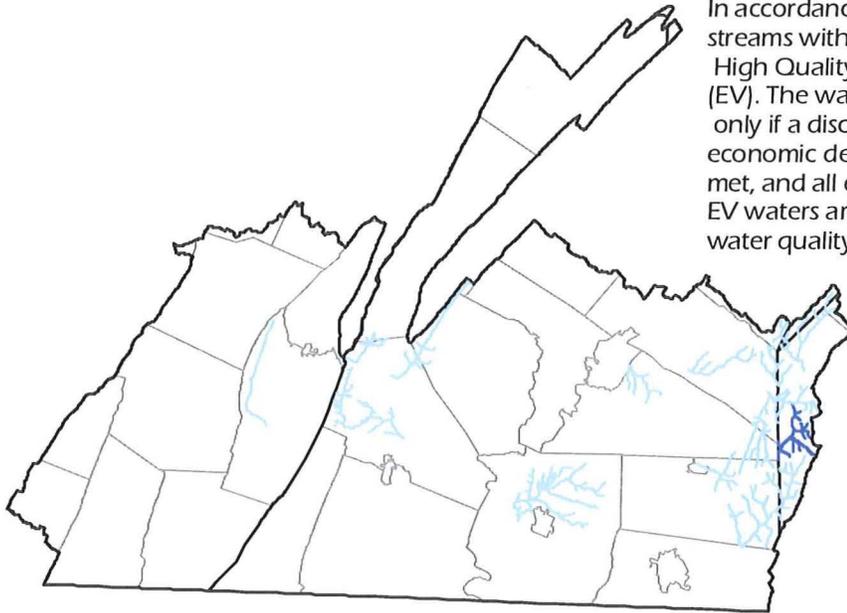
-  Habitat Modification
-  Habitat Modifications and Other
-  Land Development
-  Municipal Point Source and Small Residential Runoff
-  Other
-  Recreation and Tourism
-  Small Residential Runoff
-  Source Unknown
-  Surface Mining and
Small Residential Runoff

-  Streams
 Townships
 County Boundary





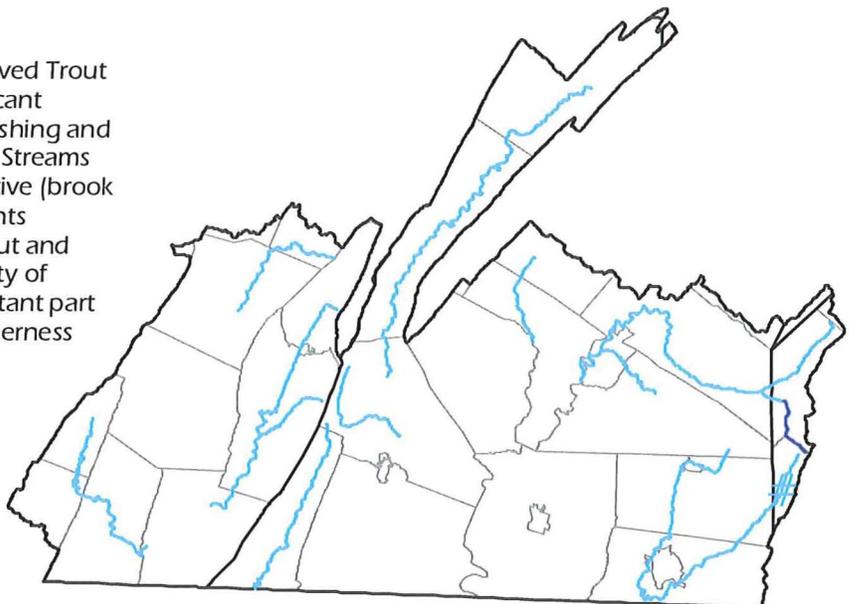
Exceptional Value and High Quality Streams⁸
 In accordance to Chapter 93 of Pennsylvania Code, streams with excellent water quality may be designated High Quality Waters (HQ) or Exceptional Value Waters (EV). The water quality in an HQ stream can be lowered only if a discharge is the result of necessary social or economic development, the water quality criteria are met, and all existing uses of the stream are protected. EV waters are to be protected at their existing quality; water quality shall not be lowered.



-  Exceptional Value Streams
-  High Quality Streams
-  Townships
-  County Boundary

Pennsylvania Trout Waters⁹

Approved Trout Waterbodies and Approved Trout Streams are waters which contain significant portions that are open to the public for fishing and are stocked with trout. Wilderness Trout Streams are designed to protect and promote native (brook trout) fisheries, the ecological requirements necessary for natural reproduction of trout and wilderness aesthetics. The superior quality of these watersheds is considered an important part of the overall angling experience on wilderness trout streams.



-  Approved Trout Waterbodies
-  Approved Trout Streams
-  Wilderness Trout Streams
-  Townships
-  County Boundary



Water Resource Points¹⁰

A Water Resource is a DEP primary facility type related to the Water Use Planning Program. The sub-facility types related to Water Resources that are included are:

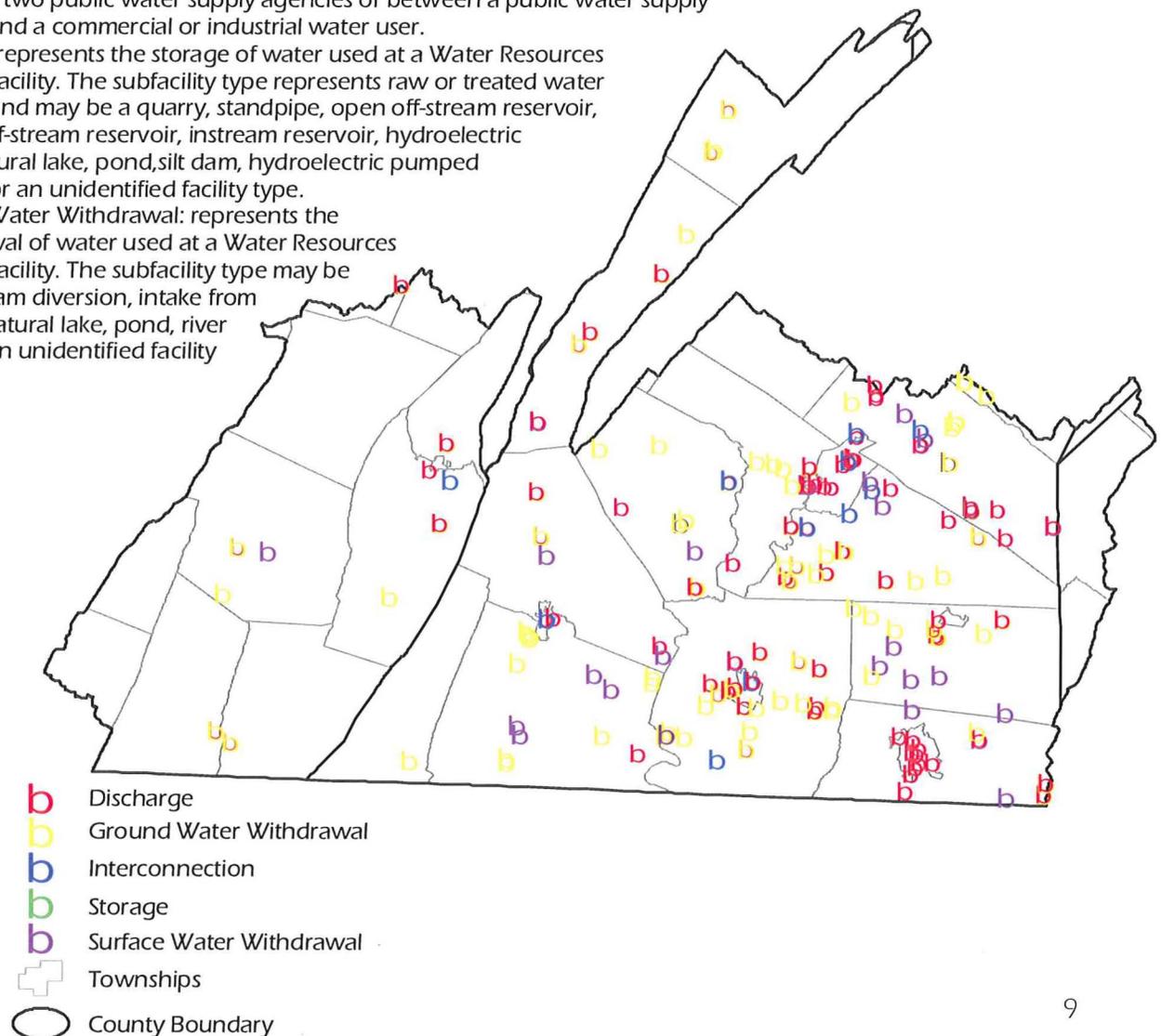
Discharge: represents the return of water used at a Water Resources primary facility. The subfacility type may be a sewage treatment plant, instream discharge, spray irrigation field, groundwater recharge, on-lot septic or an unidentified facility type.

Ground Water Withdrawal: represents the withdrawal of water used at a Water Resources primary facility. The subfacility type may be a well, spring, quarry, infiltration gallery, deep mine, surface mine or an unidentified facility type.

Interconnection: represents the point of interconnection between Water Resources primary facilities. The subfacility type may be for an interconnection between two public water supply agencies or between a public water supply agency and a commercial or industrial water user.

Storage: represents the storage of water used at a Water Resources primary facility. The subfacility type represents raw or treated water storage and may be a quarry, standpipe, open off-stream reservoir, closed off-stream reservoir, instream reservoir, hydroelectric dam, natural lake, pond, silt dam, hydroelectric pumped storage or an unidentified facility type.

Surface Water Withdrawal: represents the withdrawal of water used at a Water Resources primary facility. The subfacility type may be an instream diversion, intake from a dam, natural lake, pond, river well, or an unidentified facility type.





Natural Heritage Inventory Sites ¹¹

These areas are intended to identify outstanding floral, faunal, and geologic features, including natural communities (habitats) and locations of animal and plant species of special concern (endangered, threatened, or rare).

Area Types in this watershed include:

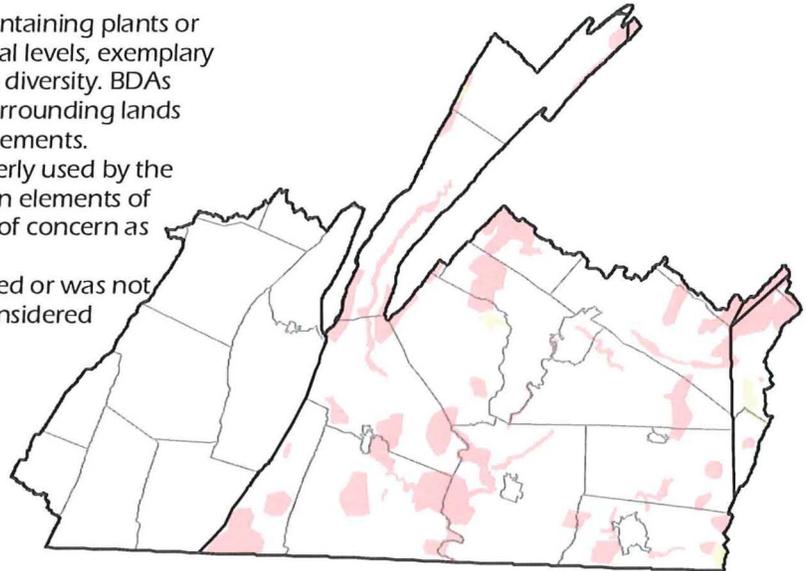
BDA - Biological Diversity Area - an area containing plants or animals of special concern at state or federal levels, exemplary natural communities, or exceptional native diversity. BDAs include both the immediate habitat and surrounding lands important in the support of these special elements.

CNA - County Natural Area - an area formerly used by the Eastern Office of PNHP for sites that contain elements of exemplary natural communities or species of concern as tracked by PNHP.

LS - Locally Significant - site was not surveyed or was not found to contain PNHP elements, but is considered Locally Significant.

Natural Heritage Inventory Sites

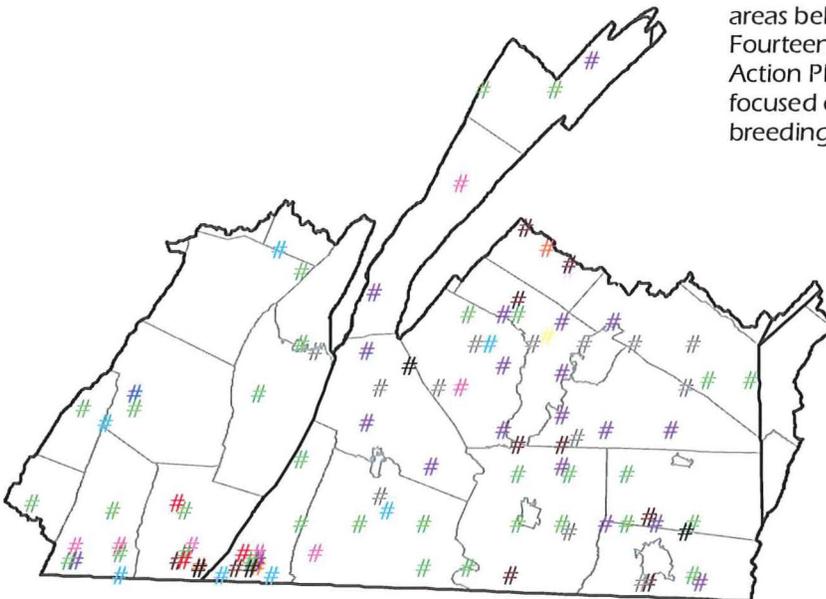
-  BDA
-  CNA
-  LS
-  Townships
-  County Boundary



Pennsylvania Breeding Bird Atlas ¹²

The 1st Pennsylvania Breeding Bird Atlas (1992) assesses the distribution of breeding birds across the state. The areas below are confirmed breeding areas for species. Fourteen birds species from Pennsylvania's state Wildlife Action Plan associated with agricultural landscapes were focused on in this assessment, not all have confirmed breeding area in this watershed.

- # American Woodcock
- # Barn Owl
- # Blackbilled Cuckoo
- Bobolink
- # Dickcissel
- # Eastern Meadowlark
- # Grasshopper Sparrow
- # Henslows Sparrow
- # Northern Bobwhite
- # Northern Harrier
- # Redheaded Woodpecker
- # Whip-poor-will
- # Yellow Breasted Chat
-  Townships
-  County Boundary

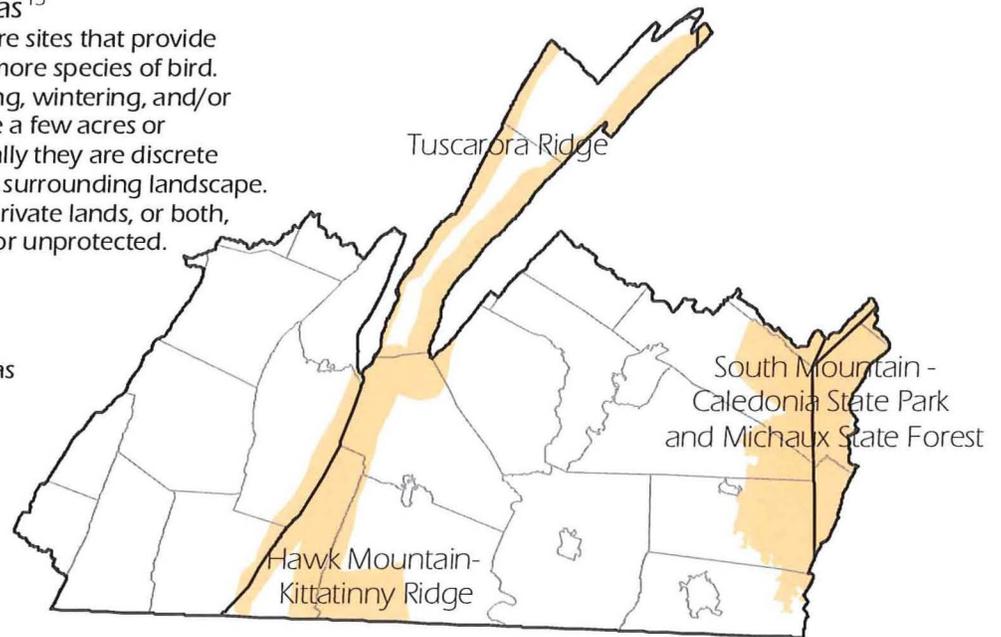




Important Bird Areas¹³

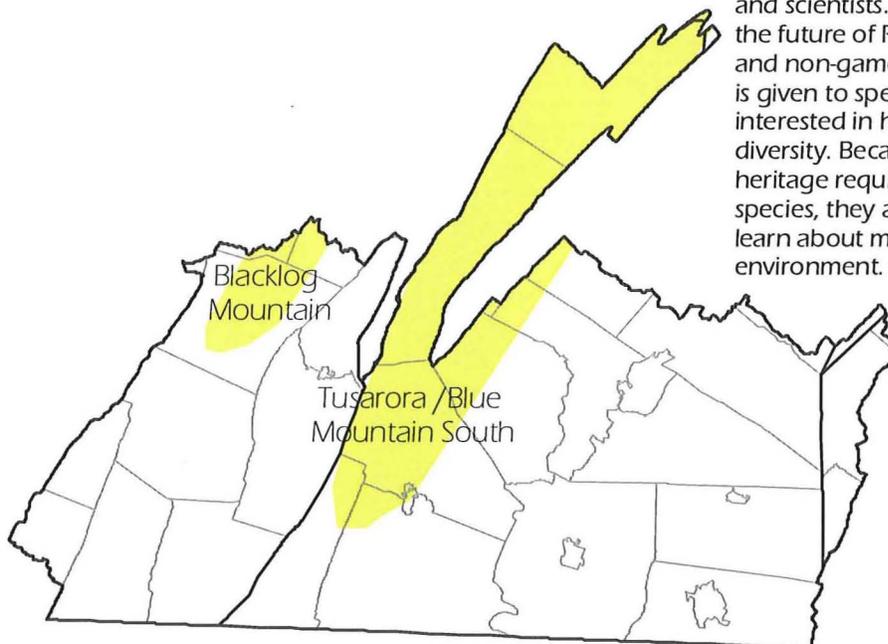
Important Bird Areas (IBA) are sites that provide essential habitat for one or more species of bird. IBAs include sites for breeding, wintering, and/or migrating birds. IBAs may be a few acres or thousands of acres, but usually they are discrete sites that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected or unprotected.

-  Important Bird Areas
-  Townships
-  County Boundary



Important Mammal Areas¹⁴

The Important Mammal Areas Project is being carried out by a broad based alliance of sportsmen, conservation organizations, wildlife professionals, and scientists. The primary concern is to help ensure the future of Pennsylvania's wild mammals, both game and non-game species. Although particular attention is given to species of special concern, they are also interested in habitats that simply have high mammal diversity. Because a commitment to preserve natural heritage requires understanding the needs of native species, they also identify places where people can learn about mammals and enjoy them in their natural environment.



-  Important Mammal Areas
-  Townships
-  County Boundary

Soils ¹⁵



Drainage Classification

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized – excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."



Drainage Classification

Drainage Classification	% Area
Excessively - Somewhat excessively drained	3.6
Well drained	69.6
Moderately well drained	18.8
Somewhat poorly drained	1.8
Poorly -Very poorly drained	4.2
Water	.4
Unclassified	1.6
County Boundary	



Farmland Classification

Farmland classification identifies soil map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No. 21, January 31, 1978.



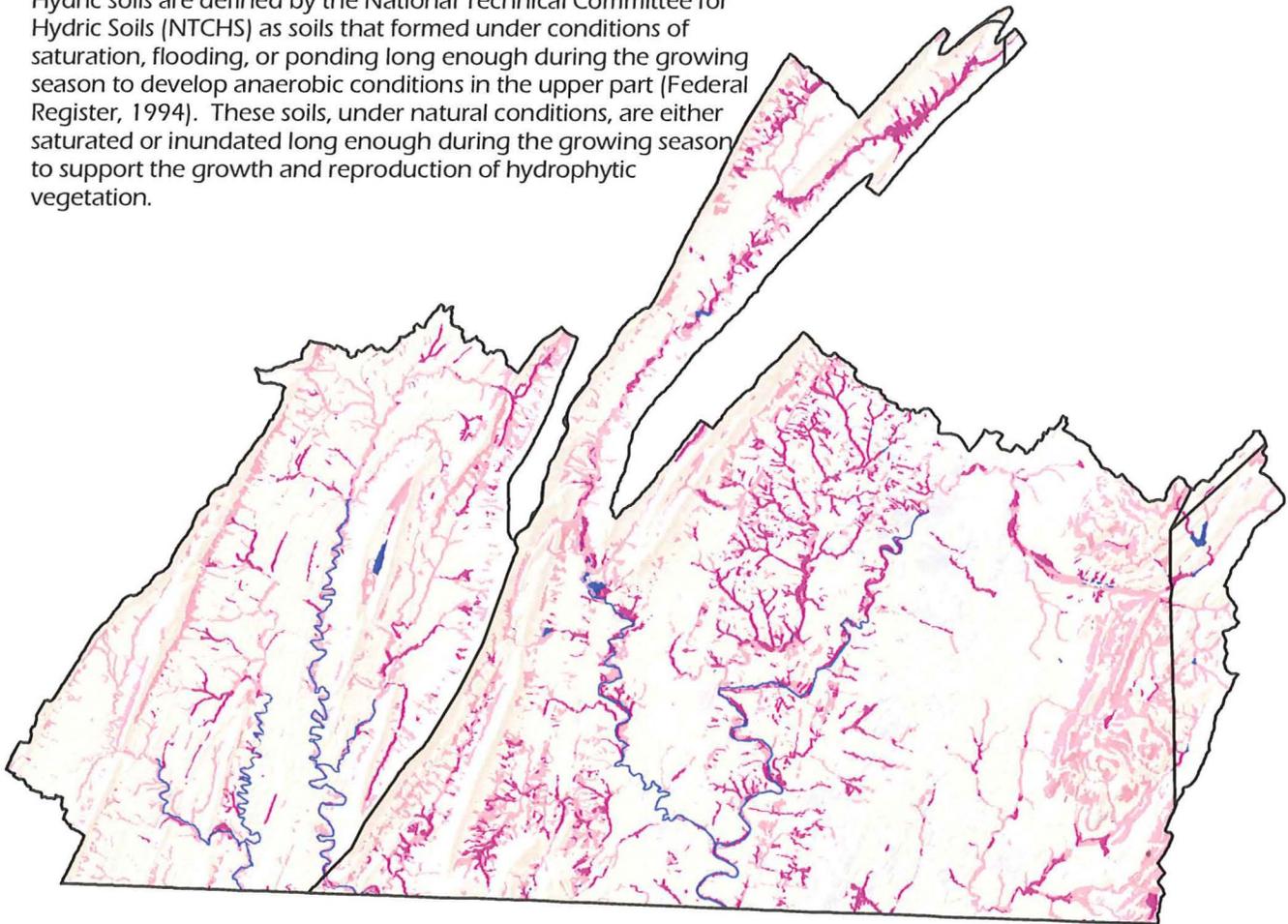
Farmland Classification		% Area
	All areas are prime farmland	23.8
	Farmland of statewide importance	22.4
	Not prime farmland or statewide importance	53.8
	County Boundary	



Hydric Soil Classification

This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.



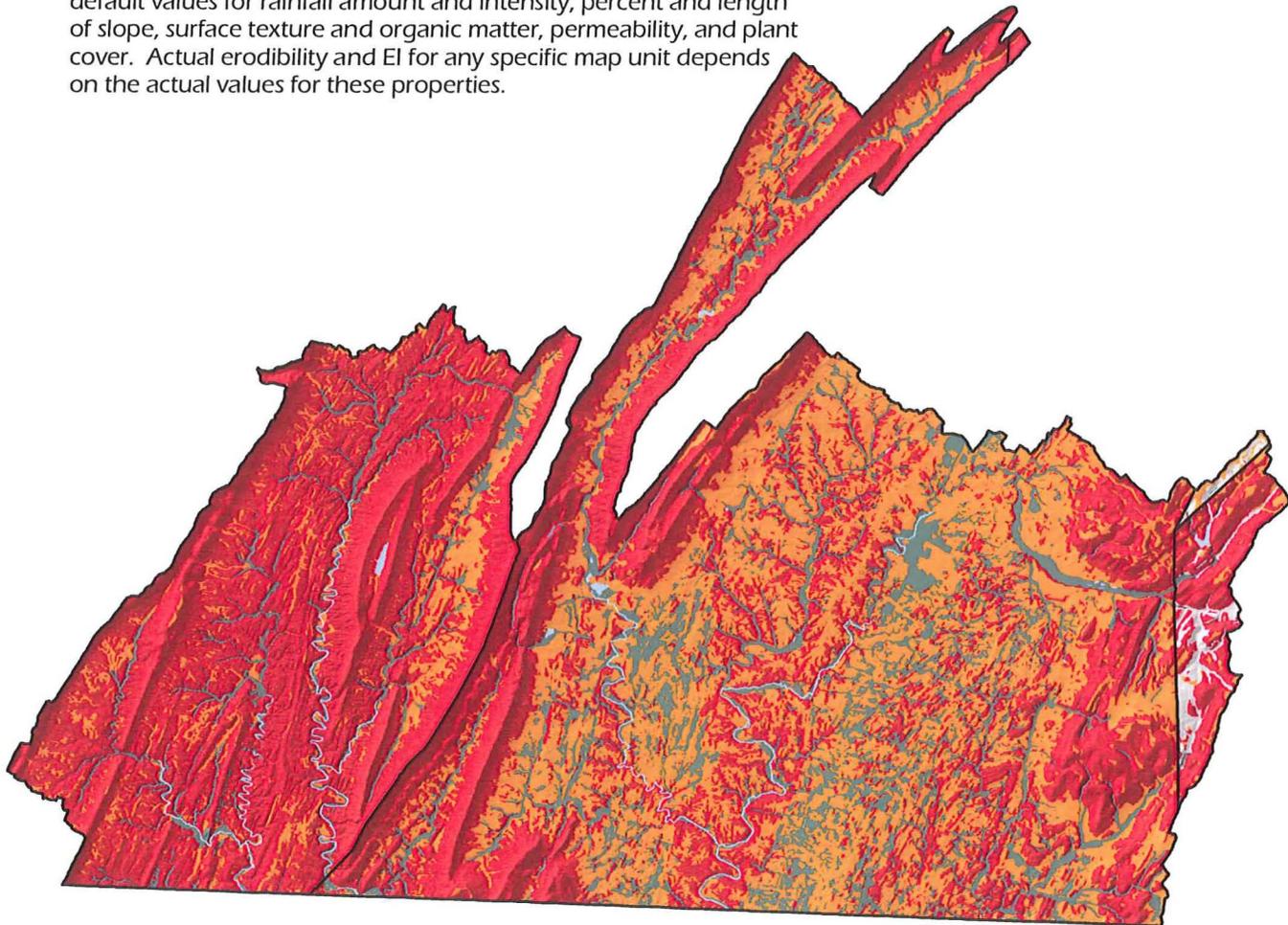
Hydric Classification

	% Area
Not Hydric	79.6
 Partially Hydric	12.6
 All Hydric	4.2
 Water	.4
 Unknown	3.2
 County Boundary	



Highly Erodible Land

A soil map with an erodibility index (EI) of 8 or greater is considered to be highly erodible land (HEL). The EI for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil in the FOTG as of January 1, 1990. Potential erodibility is based on default values for rainfall amount and intensity, percent and length of slope, surface texture and organic matter, permeability, and plant cover. Actual erodibility and EI for any specific map unit depends on the actual values for these properties.

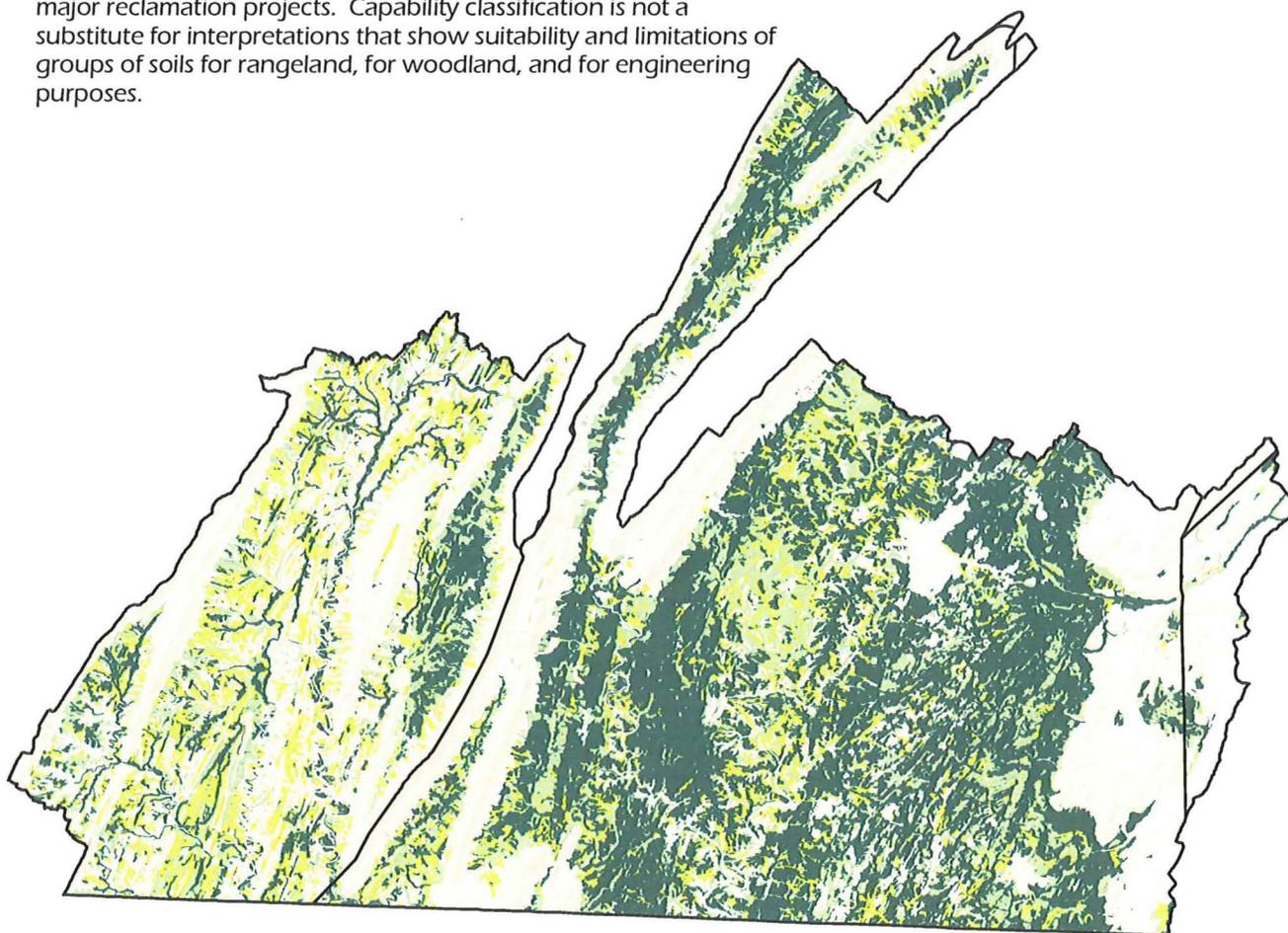


Erosion Classification		% Area
	Not highly erodible land	11.1
	Potentially highly erodible land	33.6
	Highly erodible land	54.2
	Water	.4
	Unrated	.7
	County Boundary	



Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

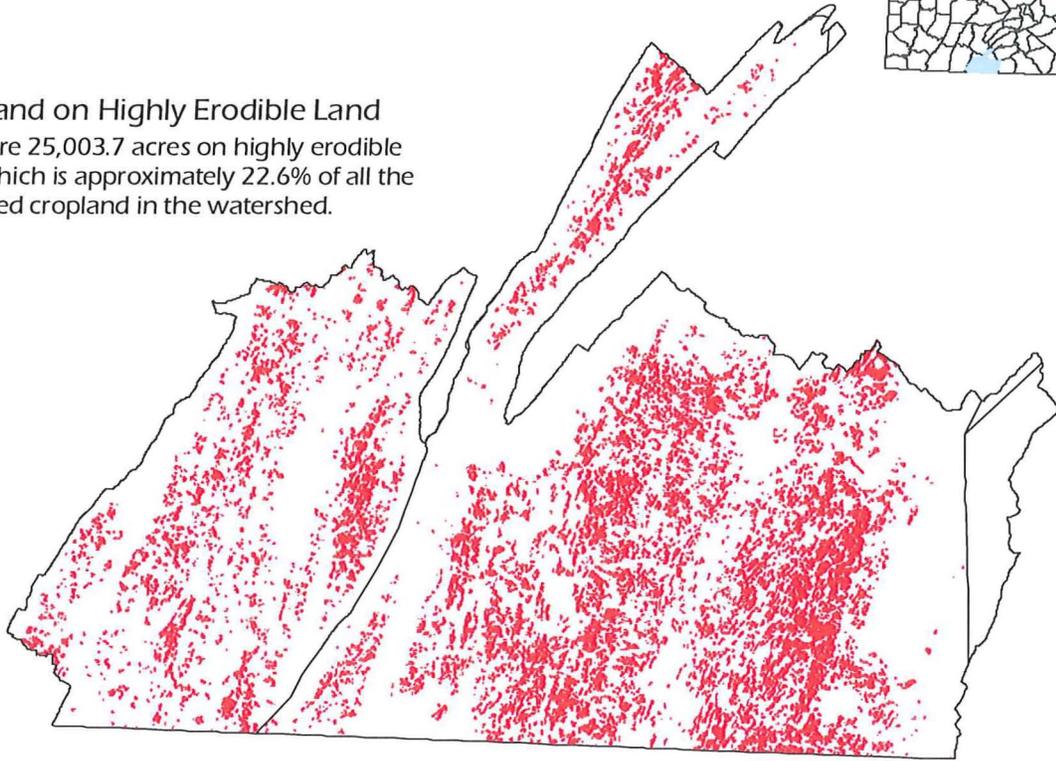


Land Capability Classification	% Area
 Well Suited (Capability Class 1 -2)	29.9
 Moderately well suited (Capability Class 3)	17.5
 Poorly suited (Capability Class 4 -5)	11.7
 Unsuited (Capability Class 6 - 8)	40.9
 County Boundary	



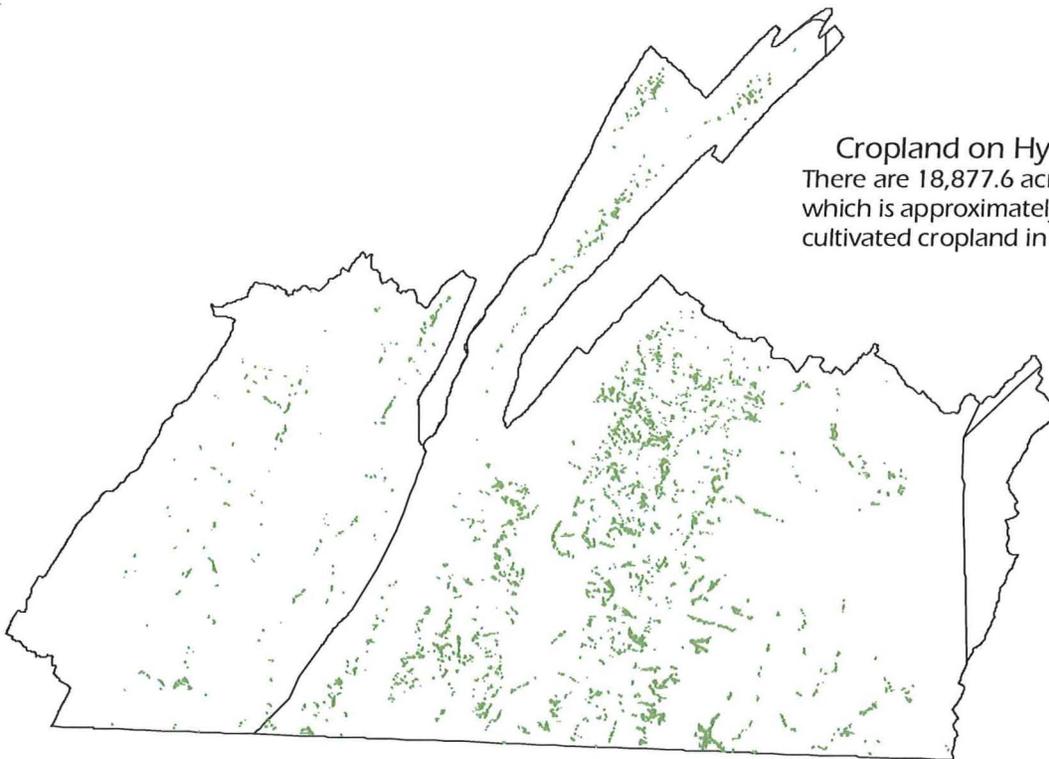
Cropland on Highly Erodible Land

There are 25,003.7 acres on highly erodible land, which is approximately 22.6% of all the cultivated cropland in the watershed.

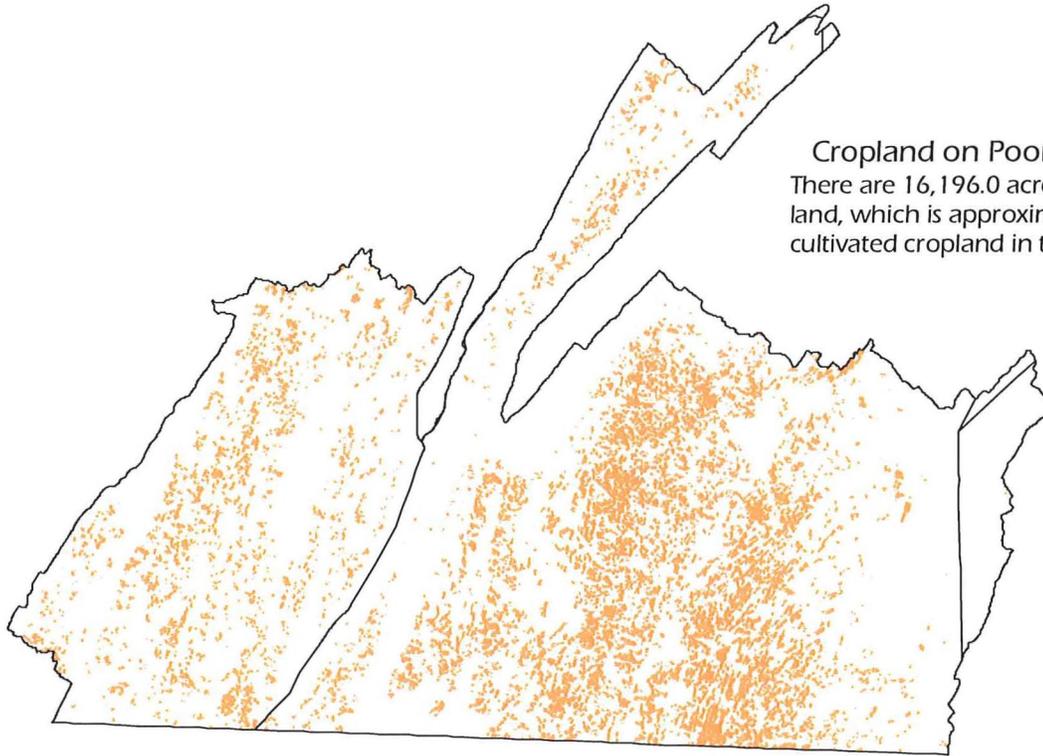


Cropland on Hydric Soils

There are 18,877.6 acres on hydric soils, which is approximately 17.0% of all the cultivated cropland in the watershed.

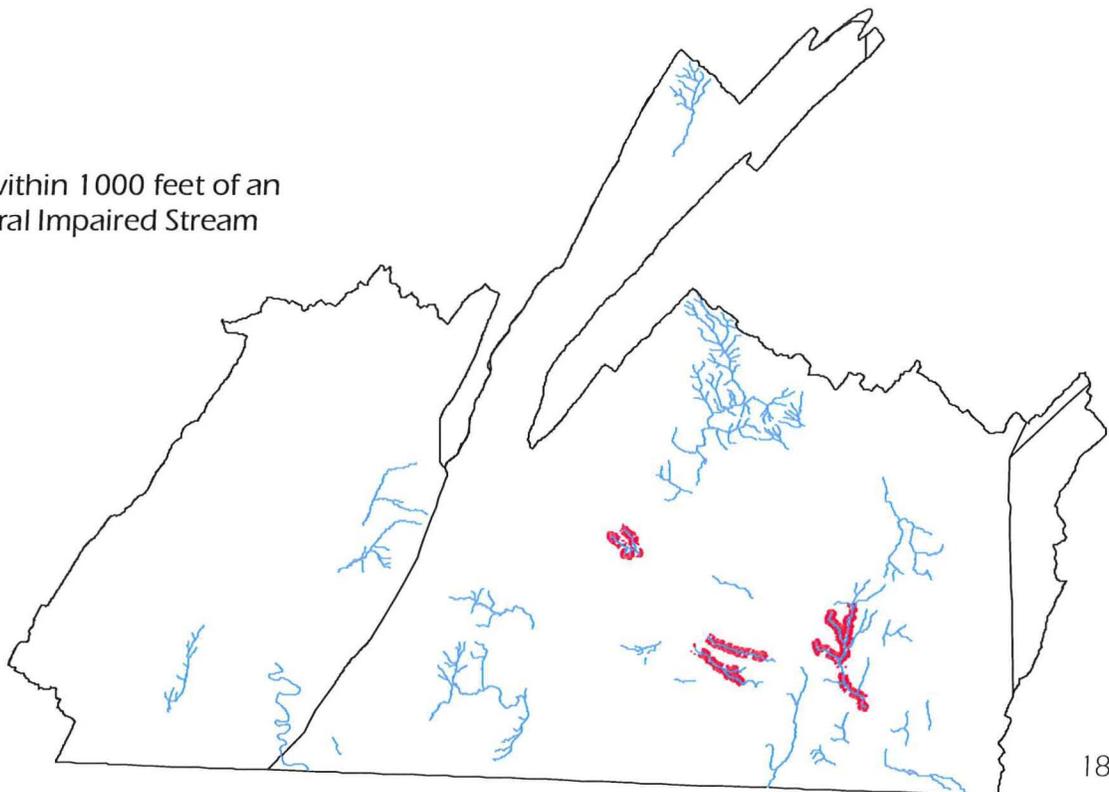


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Cropland on Poor or Unsuited Soil
There are 16,196.0 acres on poor or unsuited land, which is approximately 14.6% of all the cultivated cropland in the watershed.

Cropland within 1000 feet of an Agricultural Impaired Stream





Resource Concerns

Major resource concerns in the area include:

- erosion
- sedimentation
- maintenance of organic content
- productivity of soils

Conservation Practices

Common conservation practices for cropland:

- conservation tillage
- cover crops
- contour farming
- field borders
- grassed waterways
- diversions
- riparian buffers

Common pasture management practices:

- nutrient management
- pest management
- prescribed grazing

Conococheague-Opequon Watershed



PRS Performance Measures ¹⁶

	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Total
Total Conservation Systems Planned (acres)	4107	30,341	3734	9501	6754	NA	3998	8782	67,217
Total Conservation Systems Applied (acres)	1242	10,570	2962	11,349	5245	NA	2398	10,441	44,207
Key Conservation Treatments									
Waste Storage Facility (number)	11	13	33	10	2	0	0	12	81
Riparian Forest Buffer (acres)	14	145	22	168	279	130	98	78	934
Erosion Control Total Soils Saved (tons/year)	4849	11,708	4181	5490	5379	NA	NA	NA	31,607
Nutrient Management (acres)	3433	12,482	4572	6341	5609	936	677	1063	35,113
Pest Management (acres)	0	0	0	121	333	0	271	37	762
Prescribed Grazing (acres)	94	1935	560	801	1016	877	321	584	6,188
Tree and Shrub Establishment (acres)	12	1	14	87	32	0	0	1	147
Residue Management (acres)	3745	18,245	0	3487	3167	692	945	463	30,744
Wildlife Habitat (acres)	0	393	319	1989	1612	82	523	1134	6,052
Wetlands Created, Restored, or Established	0	0	0	18	22	31	0	30	101
Acres in Conservation Programs									
Conservation Technical Assistance									
Planned	4082	30,341	3063	6106	4341	NA	2979	7430	58,342
Applied	1242	10,570	2607	9513	3084	NA	1311	5533	33,860
Conservation Reserve Program									
Planned	86	0	671	2598	1467	NA	665	485	5,972
Applied	0	0	355	1436	1805	NA	745	4320	8,661
Environmental Quality Incentive Program									
Planned	1	40	218	316	565	NA	694	1508	3,342
Applied	0	22	25	0	227	NA	3	429	706
Farmland Protection Program/Farm and Ranch Land Protection Program									
Planned	1231	663	0	0	0	NA	0	0	1,894
Applied	603	51	0	0	0	NA	0	0	654
Forestry Incentive Program									
Planned	40	0	0	10	0	NA	0	0	50
Applied	40	0	0	20	0	NA	0	0	60
Grasslands Reserve Program									
Planned				0	0	NA	0	215	215
Applied				0	0	NA	6	28	34
Grazing Lands Conservation Initiative									
Planned	110	551	1211						1,872
Applied	55	136	530						1,442
Wildlife Habitat Incentive Program									
Planned	45	455	0	37	0	NA	36	0	573
Applied	0	107	0	42	0	NA	1	22	172
Wetlands Reserve Program									
Planned	0	0	0	0	0	NA	0	0	0
Applied	0	0	0	0	0	NA	0	30	30

NA - Reporting was unavailable by Hydrologic Unit Code



Social and Census Data¹⁷

	Perry	Cumberland	Adams	Fulton	Franklin	Total
Farms (number)	2	4	67	356	1117	1546
Land in farms (acres)	258	573	9,597	63,865	192,864	267,157
Total cropland (acres)	179	461	7,157	34,032	150,596	192,425
Principal operator by primary occupation - Farming (number)	1	3	37	195	770	1006
Farms by Size						
1 to 9 acres	0	0	6	22	93	121
10 to 49 acres	0	1	27	43	255	326
50 to 179 acres	1	2	21	173	407	604
180 to 499 acres	0	1	9	97	293	400
500 to 999 acres	0	0	3	20	55	78
1,000 acres or more	0	0	1	3	13	17
Livestock and Poultry						
Cattle and calves inventory (farms)	1	2	24	195	712	934
Cattle and calves inventory - Beef cows (farms)	0	1	14	140	230	385
Cattle and calves inventory - Milk cows (farms)	0	1	3	36	384	424
Hogs and pigs inventory (farms)	0	0	3	30	77	110
Sheep and lambs inventory (farms)	0	0	3	19	58	80
Layers 20 weeks old and older inventory (farms)	0	0	5	32	118	155
Broilers and other meat-type chickens sold (farms)	0	0	0	4	23	27
Crops Harvested						
Corn for grain (acres)	17	77	1076	2443	15,197	18,810
Corn for silage or greenchop (acres)	23	88	464	3936	40,976	45,487
Wheat for grain, all (acres)	8	30	728	920	5955	7641
Oats for grain (acres)	4	6	33	914	1002	1959
Barley for grain (acres)	3	13	66	629	3706	4417
Soybeans for beans (acres)	14	44	804	174	10,963	11999
Forage - land used for all hay and all haylage, grass silage, and greenchop (acres)	72	145	2,156	17,595	53,740	73,708
Vegetables harvested for sale (acres)	0	4	24	10	556	594
Land in orchards (acres)	0	2	913	13	3075	4003
Total cropland harvested (acres)	139	396	6,152	25,923	129,922	162,532
Farm Operator by Ethnicity						
White	2	6	99	523	1665	2295
Black or African American	0	0	0	1	6	7
Asian	0	0	0	0	2	2
Hispanic	0	0	1	3	9	13
American Indian/Alaskan Native	0	0	0	1	1	2
Pacific Islander	0	0	0	0	1	1
Women	0	2	27	112	396	537



Partnership Groups:

A cooperative project involving NRCS and conservation partners, including:

- State Conservation Commission
- Pennsylvania Department of Environmental Protection
- Pennsylvania Game Commission
- Pennsylvania Grazing/Forage Lands Conservation Coalition
- Pennsylvania Fish & Boat Commission



Footnotes/Bibliography

All data is provided "as is". There is no warranties, express or implied, including the warranty of fitness for a particular purpose, accompanying this document. Use for planning purpose only.

- 1. Common Resource Area**
Common Resource Area (CRA) delineation is defined as a geographical area where resource concerns, problems, or treatment needs are similar. More information can be found online at <http://soils.usda.gov/survey/geography/cra.html>
- 2. National Elevation Dataset (NED)**
The NED is a seamless mosaic of the best-available elevation data. The primary source data were the USGS 7.5-minute (30-meter or 10-meter resolution) DEM's. A hillshade grid was also created using the DEM and used to create a 3-D effect. More information on NED can be found online at <http://ned.usgs.gov/>
- 3. Land Use / Land Cover 2001**
Land Use / Land Cover map was created using the National Land Cover Dataset. The National Land Cover Dataset was compiled from Landsat satellite TM imagery with a spatial resolution of 30 meters and supplemented by various ancillary data (where available). More information can be found online at <http://landcover.usgs.gov/>
- 4. Average Annual Precipitation**
The average annual precipitation data for this map layer were produced through a partnership between NRCS and the Spatial Climate Analysis Service at Oregon State University (OSU). The average annual precipitation is from 1961 through 1990. More information can be found online at <http://www.ncgc.nrcs.usda.gov/products/datasets/climate/index.html>
- 5. National Wetlands Inventory (NWI)**
The NWI maps do not show all wetlands since the maps are derived from aerial photointerpretation with varying limitations due to scale, photo quality, inventory techniques, and other factors. More information can be found online at <http://www.fws.gov/nwi/>
- 6. Impaired Streams**
Impaired Streams were derived from Pennsylvania Department of Protection Office of Water Management, 2006 list on Non-Attaining Streams. More information can be found on DEP website at <http://www.depweb.state.pa.us/dep/site/default.asp>
- 7. Water Quality Testing Points**
Water Quality Testing Points monitor water quality with emphasis on stream acidity in Pennsylvania with an associated database. The database contains more than 33,466 records on water quality from 1986 to the present from 622 testing sites throughout Pennsylvania. Information in the records includes alkalinity and Ph and includes nitrates and phosphates for some sites since 1996. The information is maintained by the Alliance for Aquatic Resource Monitoring. More information can be found online at <http://alpha.dickinson.edu/storg/allarm/allarm%20projects/database.htm>
- 8. Exceptional Value and High Quality Streams**
Exceptional Value and High Quality Streams were taken from the Chapter 93 data layer received from Pennsylvania Department of Environmental Protection. For more information on what qualifies a stream as exceptional value or high quality or any information on Chapter 93 streams go to <http://www.pacode.com/secure/data/025/chapter93/chap93toc.html>



Footnotes/Bibliography

9. Pennsylvania Trout Waters

Pennsylvania Trout Water data is compiled by the Pennsylvania Fish and Boat Commission. This layer was created based on the 1:24000 National Hydrography Dataset (NHD) water bodies layer. More information can be found online at

<http://www.fish.state.pa.us/fishpub/summary/troutwaters.html>

10. Water Resource Points

A Water Resource is a DEP primary facility type related to the Water Use Planning Program. More information can be found <http://www.depweb.state.pa.us/dep/site/default.asp>

11. Natural Heritage Inventory Sites

The Natural Areas polygons were developed by the Pennsylvania Natural Heritage Program (PNHP) County Natural Heritage Inventory (CNHI) Program. Natural Areas were identified using map and air photo interpretation, aerial reconnaissance, and field surveys. More information and county reports can be found online at <http://www.naturalheritage.state.pa.us/>

12. Pennsylvania Breeding Bird Atlas

Data was taken for the 1st Pennsylvania Breeding Bird Atlas (1992). For this watershed assessment, fourteen bird species were chosen to be focused on. More information about all bird species can be obtained at <http://www.carnegiemnh.org/atlas/home.htm>

13. Important Bird Areas

The Important Bird Areas Program (IBA) is a global effort to identify and conserve areas that are vital to birds and other biodiversity. For more information nationally and/or on the state level go to <http://www.audubon.org/bird/iba/>

14. Important Mammal Areas

Important Mammal Areas Project, IMAP, the first program of it's kind, was created by the Mammal Technical Committee of the Pennsylvania Biological Survey (PaBS). For more information go online to <http://www.pawildlife.org/imap.htm>



Footnotes/Bibliography

15. Soils

Soil Survey spatial and tabular data were used for the following survey areas:

- Adams County (PA001)
- Cumberland County (PA041)
- Franklin County (PA055)
- Fulton County (PA057)
- Huntingdon County (PA061)
- Perry County (PA099)

Spatial and tabular data can be downloaded at <http://soildatamart.nrcs.usda.gov/>

16. Performance Results System (PRS)

PRS data was extracted from PRS by year, conservation system, conservation practice, and programs by hydrologic unit code. More information can be found online at the PRS homepage

<http://ias.sc.egov.usda.gov/prshome/>

17. Social and Census Data

Ag census data and ethnicity data were downloaded from the National Agricultural Statistics Service (NASS). The data was adjusted by percent of hydrologic unit in the county. More information can be found online at http://www.nass.usda.gov/Census_of_Agriculture/index.asp