

Rapid Watershed Assessment French Creek 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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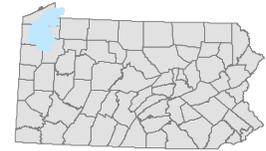
Preface

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.

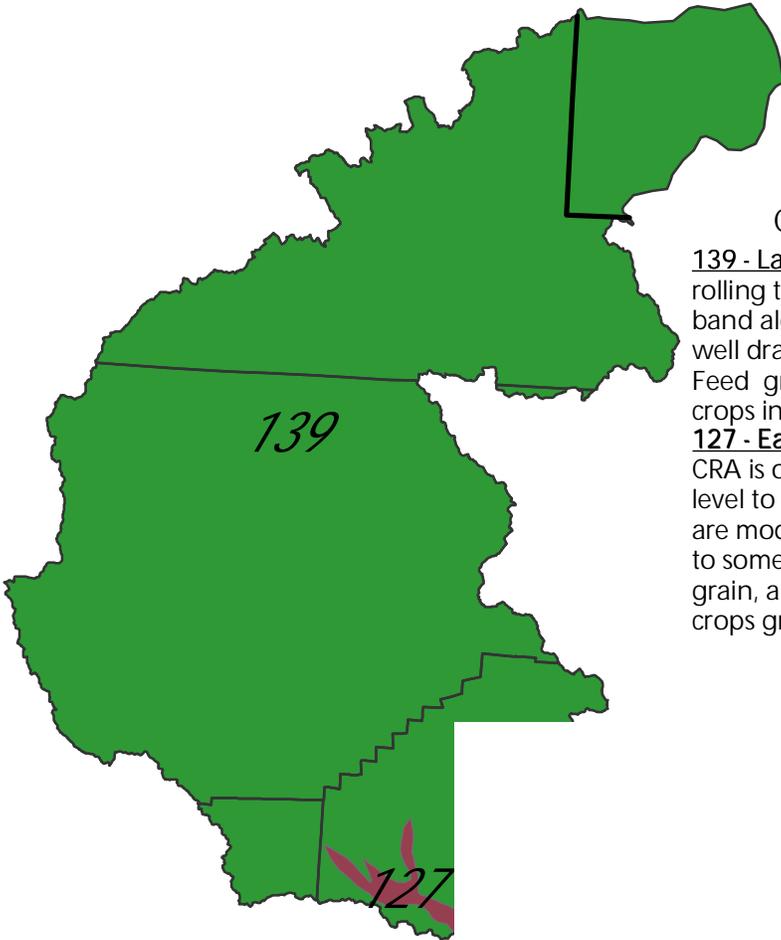
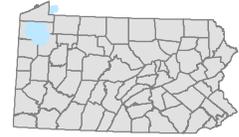
/s/ Craig R. Derickson
Pennsylvania State Conservationist



Introduction

The French Creek Watershed is located in Northwest Pennsylvania in portions of Crawford, Erie, Venango, and Mercer Counties. The French Creek Watershed also included a portion of Chautauqua County in New York State. The watershed is almost 794,000 acres in size, of which over 266,000 acres is farmland. Five Service Centers of the Natural Resources Conservation Service, five county Conservation Districts and parts of the Penn Soil Resource Conservation and Development Council in Pennsylvania and the Seneca Trail Resource Conservation and Development Council in New York provide conservation assistance in this watershed.



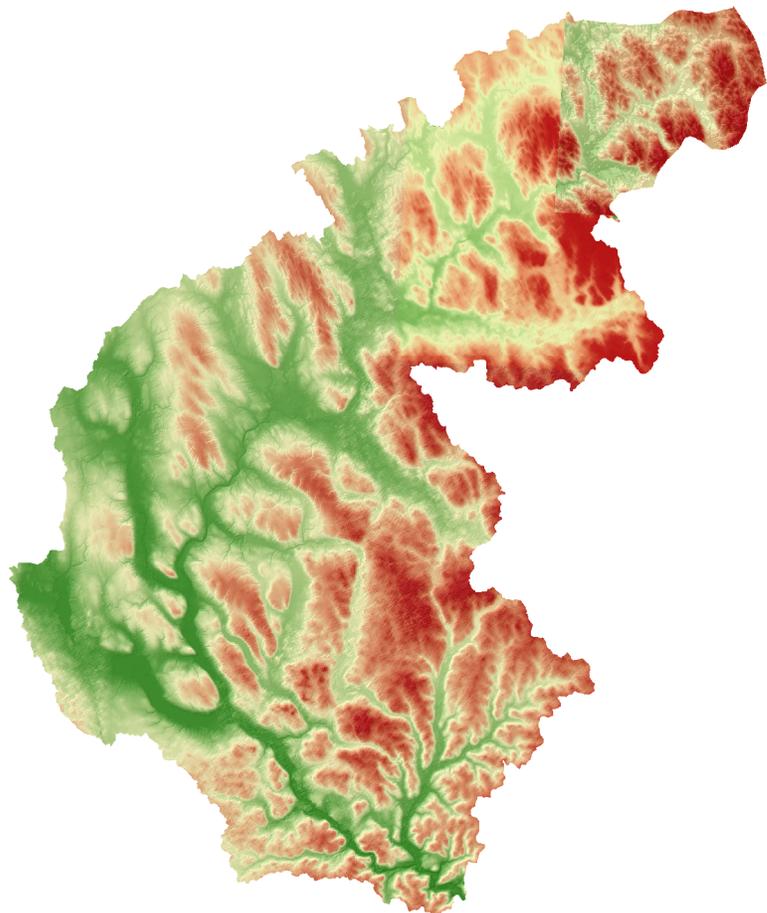


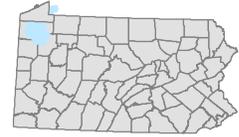
Common Resource Area (CRA)¹

139 - Lake Erie Glaciated Plateau: This CRA is a gently rolling to strong rolling, dissected plateau. A narrow band along Lake Erie is fairly flat. Soils are very deep, well drained to poorly drained, and loamy or clayey. Feed grain and forage for dairy cattle are the main crops in the area.

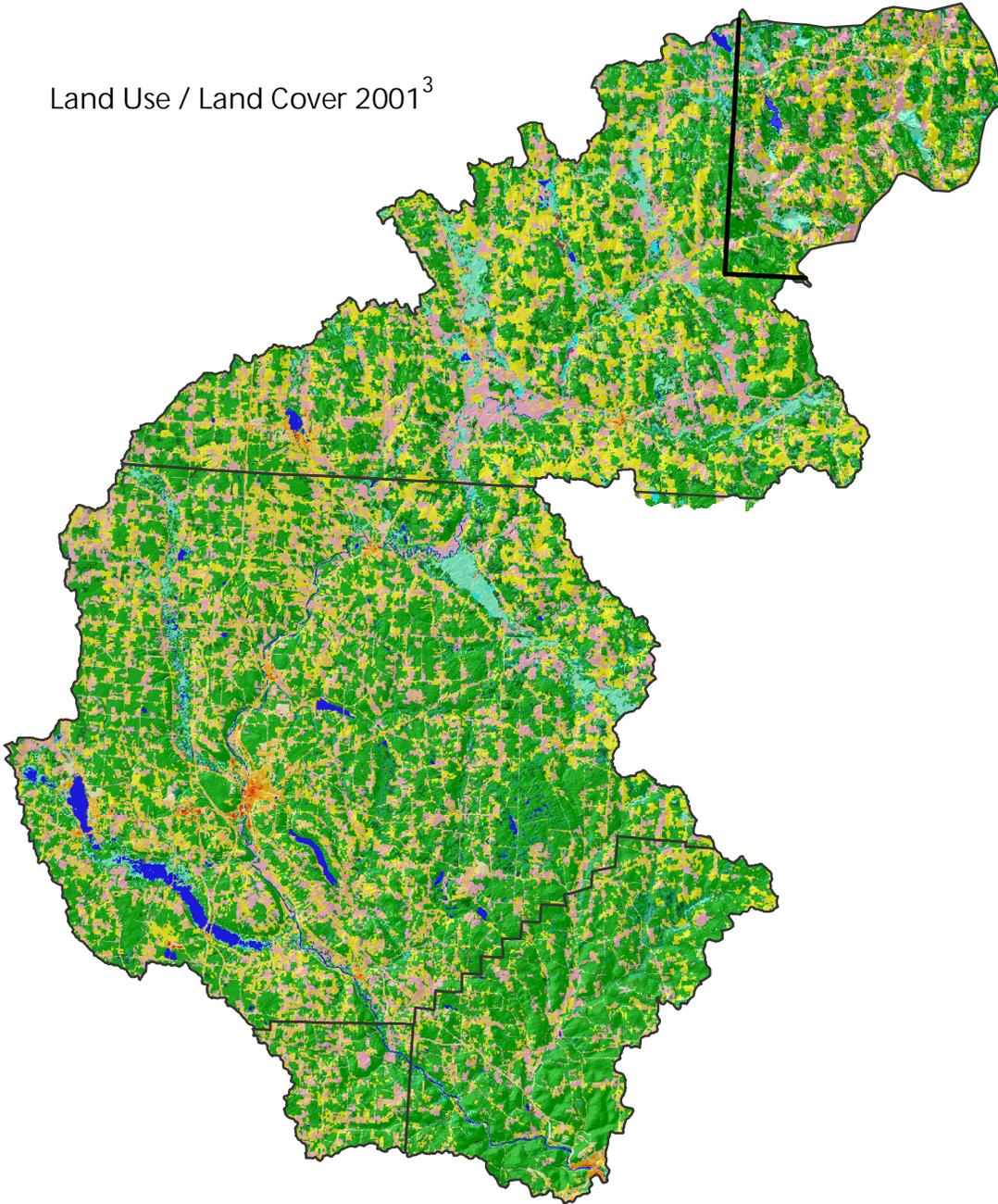
127 - Eastern Allegheny Plateau and Mountains: This CRA is on a dissected plateau with steep slopes and level to gently rolling areas in the northern part. Soils are moderately deep to very deep, excessively drained to somewhat poorly drained, and loamy. Corn, small grain, and feed for dairy and beef cattle are the principle crops grown.

Elevation²
 Elevation in the French Creek ranges from 1942 feet (592 m) at its high point to 960 feet (293 m) at a low point.

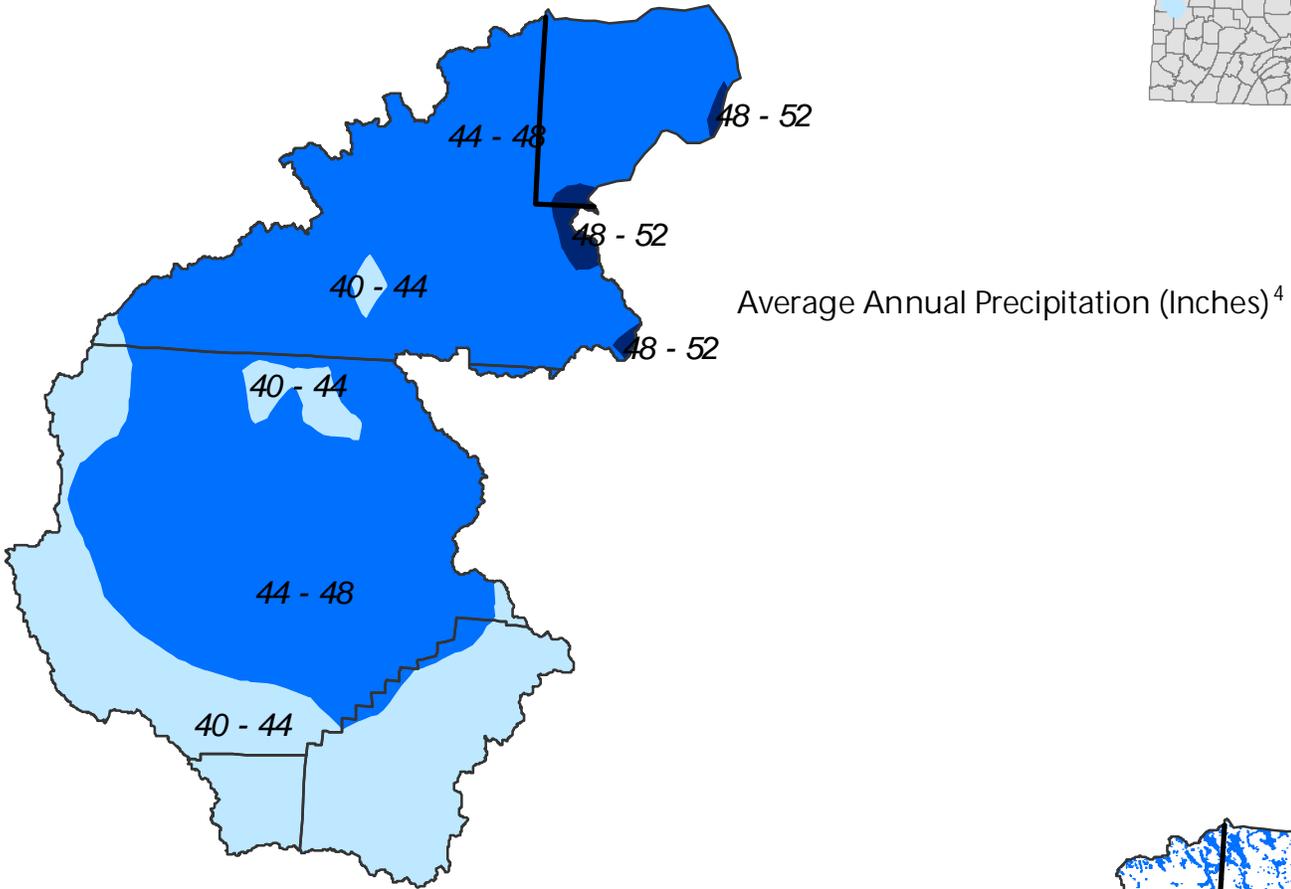
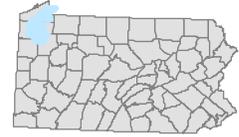




Land Use / Land Cover 2001³

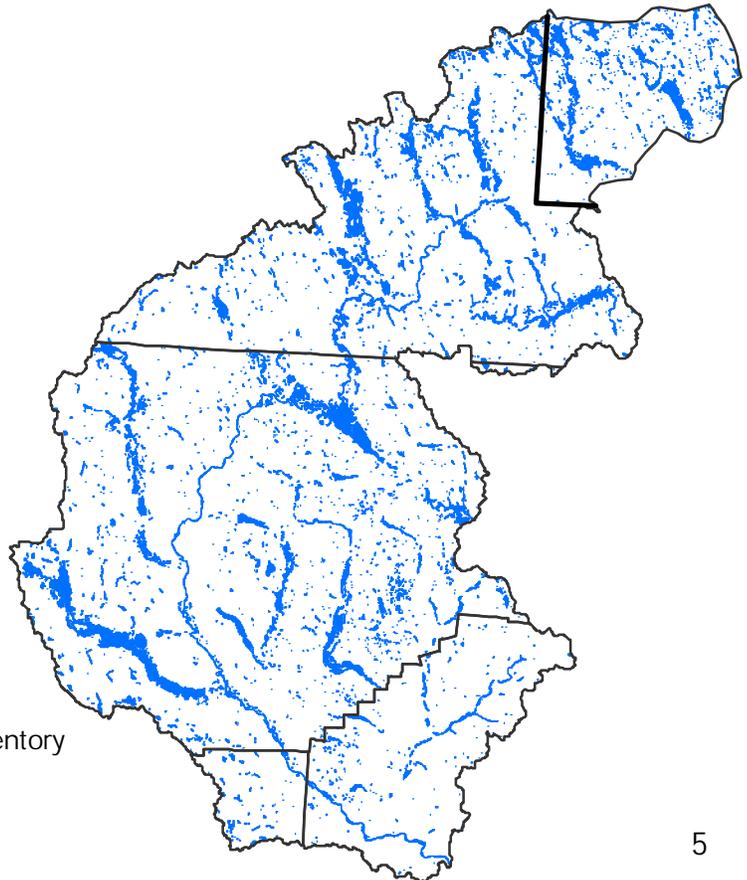


	Acres	Percent		Acres	Percent
 Water	10,473.5	1.3	 Mixed Forest	17,410.5	2.2
 Developed, Open Space	42,482.6	5.4	 Pasture/Hay	144,340.4	18.2
 Developed, Low Intensity	11,762.5	1.5	 Cultivated Crops	121,893.9	15.4
 Developed, Medium Intensity	2,262.6	.3	 Woody Wetlands	25,320.6	3.2
 Developed, High Intensity	449.2	-	 Emergent Herbaceous Wetlands	3,092.7	.4
 Barren Land (Rock/Sand/Clay)	360.0	-	 Shrub / Scrub	9,832.1	1.2
 Deciduous Forest	364,299.5	45.9	 Grassland / Herbaceous	10,064.9	1.3
 Evergreen Forest	29,562.2	3.7			



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.

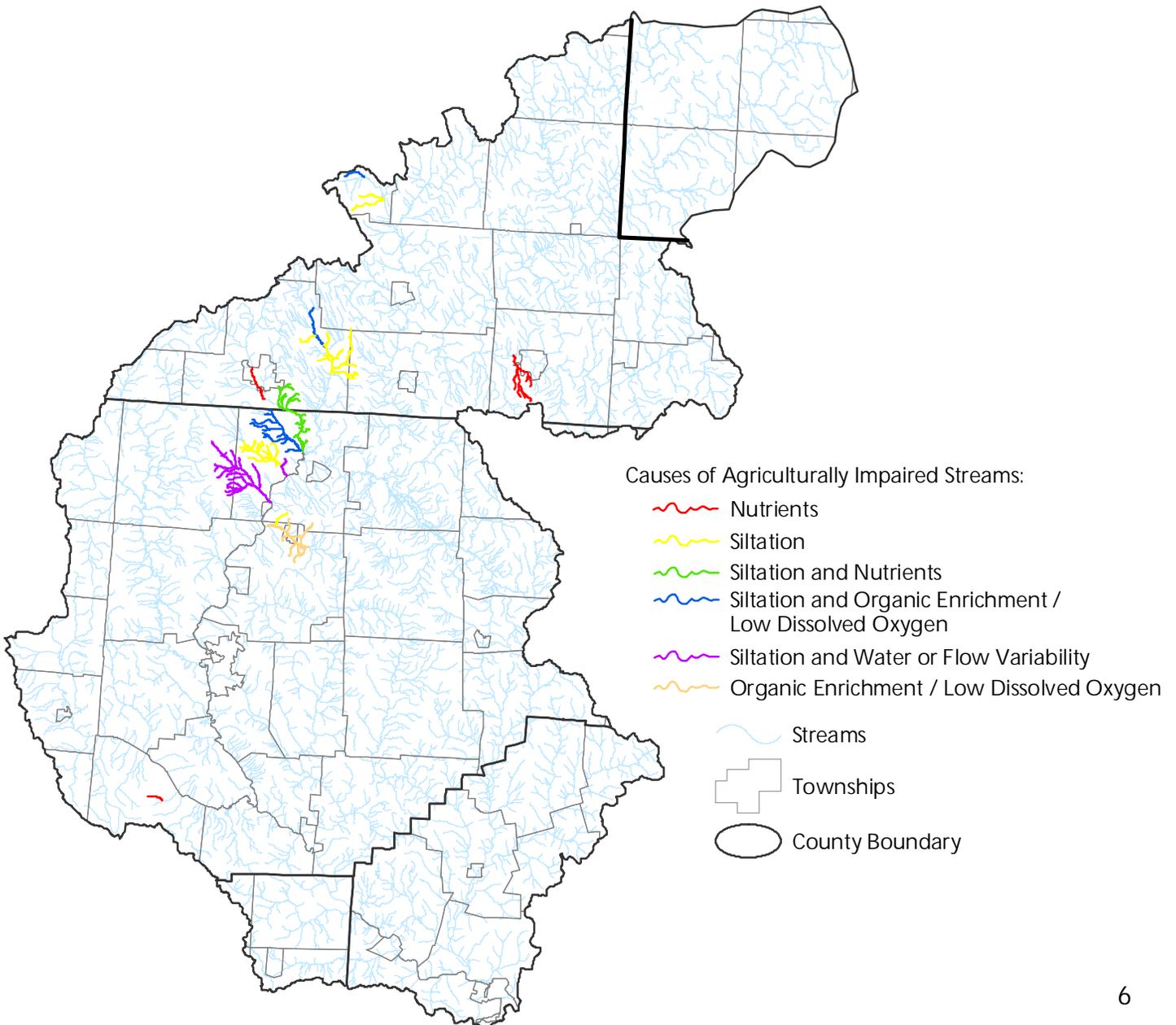


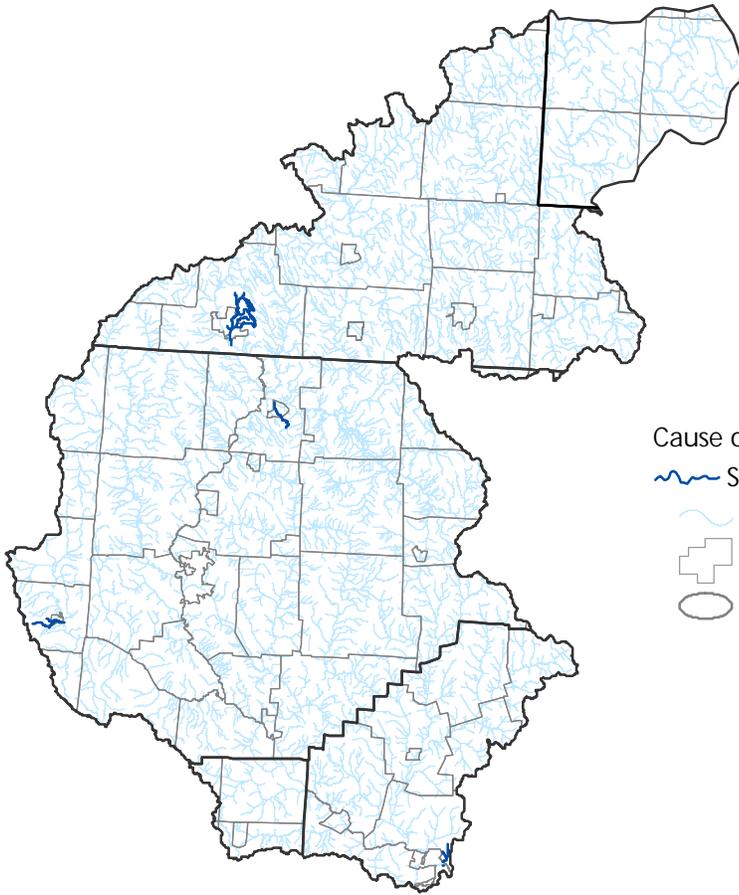
National Wetlands Inventory



Impaired Streams⁶

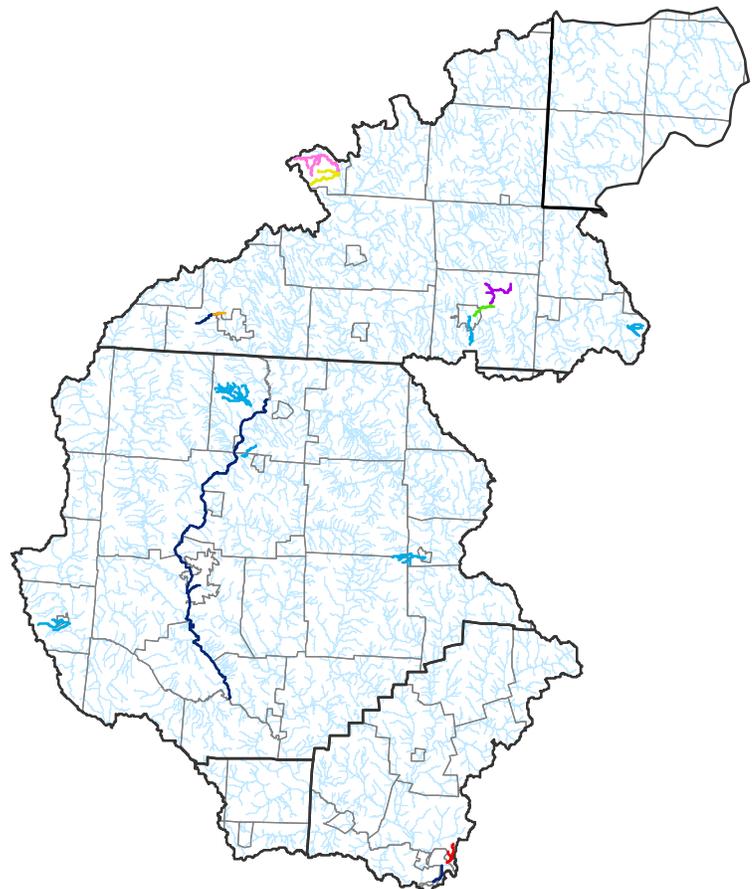
The Streams Integrated List (2006) represents stream assessments in an integrated format for the Clean Water Act Section 305(b) reporting and Section 303(d) listing. PA Department of Environmental Protection protects 4 stream water uses: aquatic life, fish consumption, potable water supply, and recreation. The 305(b) layers represents stream segments that have been evaluated for attainment of those uses and determine which streams are non-attaining.





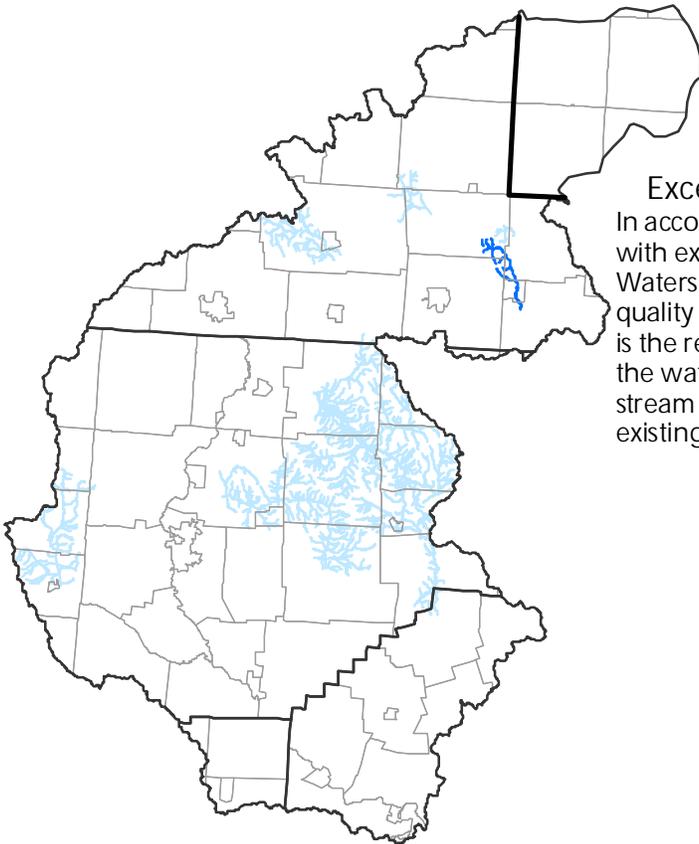
Cause of Urban Impaired Streams:

- Siltation
- Streams
- Townships
- County Boundary



Sources of Other Impaired Streams:

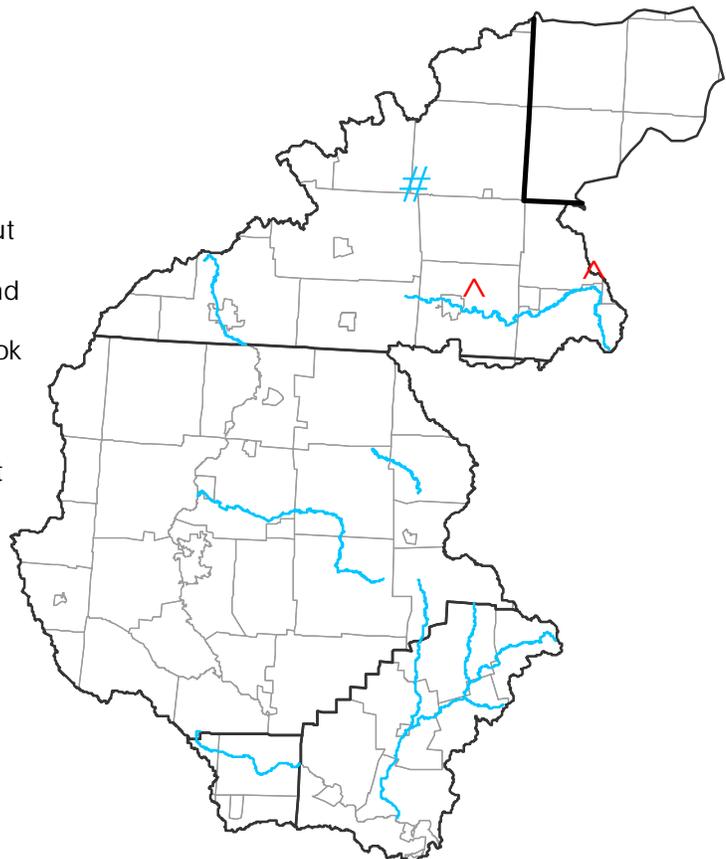
- Channelization
- Municipal Point Source
- Natural Sources
- Other
- Road Runoff
- Source Unknown
- Upstream Impoundment
- Water or Flow Variability and Natural Sources
- Streams
- Townships
- County Boundary



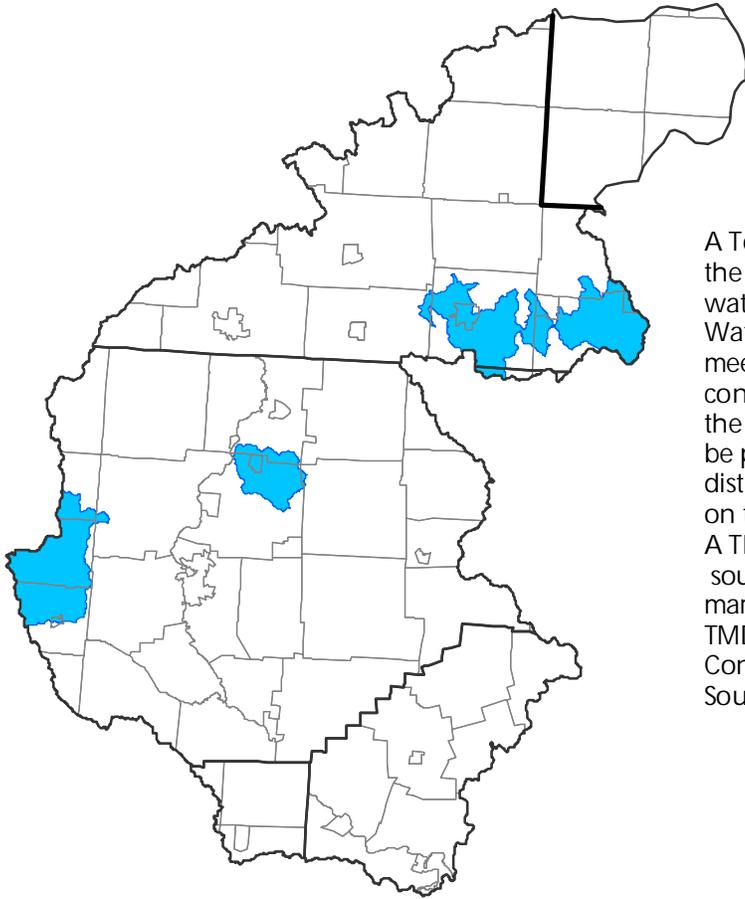
Exceptional Value and High Quality Streams⁷
 In accordance to Chapter 93 of Pennsylvania Code, streams with excellent water quality may be designated High Quality Waters (HQ) or Exceptional Value Waters (EV). The water quality in an HQ stream can be lowered only if a discharge is the result of necessary 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 Waters⁸
 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
-  State Fish Hatcheries
-  Townships
-  County Boundary



Total Maximum Daily Load⁹

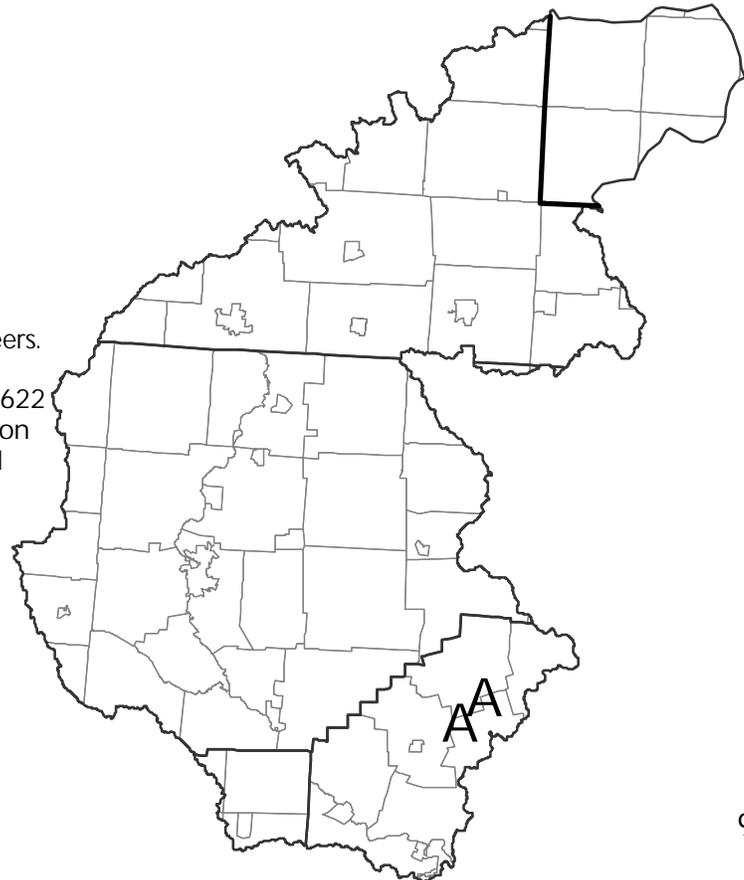
A Total Maximum Daily Load (TMDL) sets a ceiling on the pollutant loads that can enter a water body so the water body will meet water quality standards. The Clean Water Act requires states to list all waters that do not meet their water quality standards even after pollution controls required by law are in place. For these waters, the state must calculate how much of a substance can be put in the water without violating the standard and distribute that quantity to all the sources of the pollutant on that water body.

A TMDL plan includes waste load allocations for point sources, load allocations for nonpoint sources, and a margin of safety.

TMDL plans were completed in the shaded areas of Conneaut Lake in 2001 and on Gravel Run and the South Branch French Creek in 2003.

Water Quality Testing Points¹⁰

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.





Water Resource Points ¹¹

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:

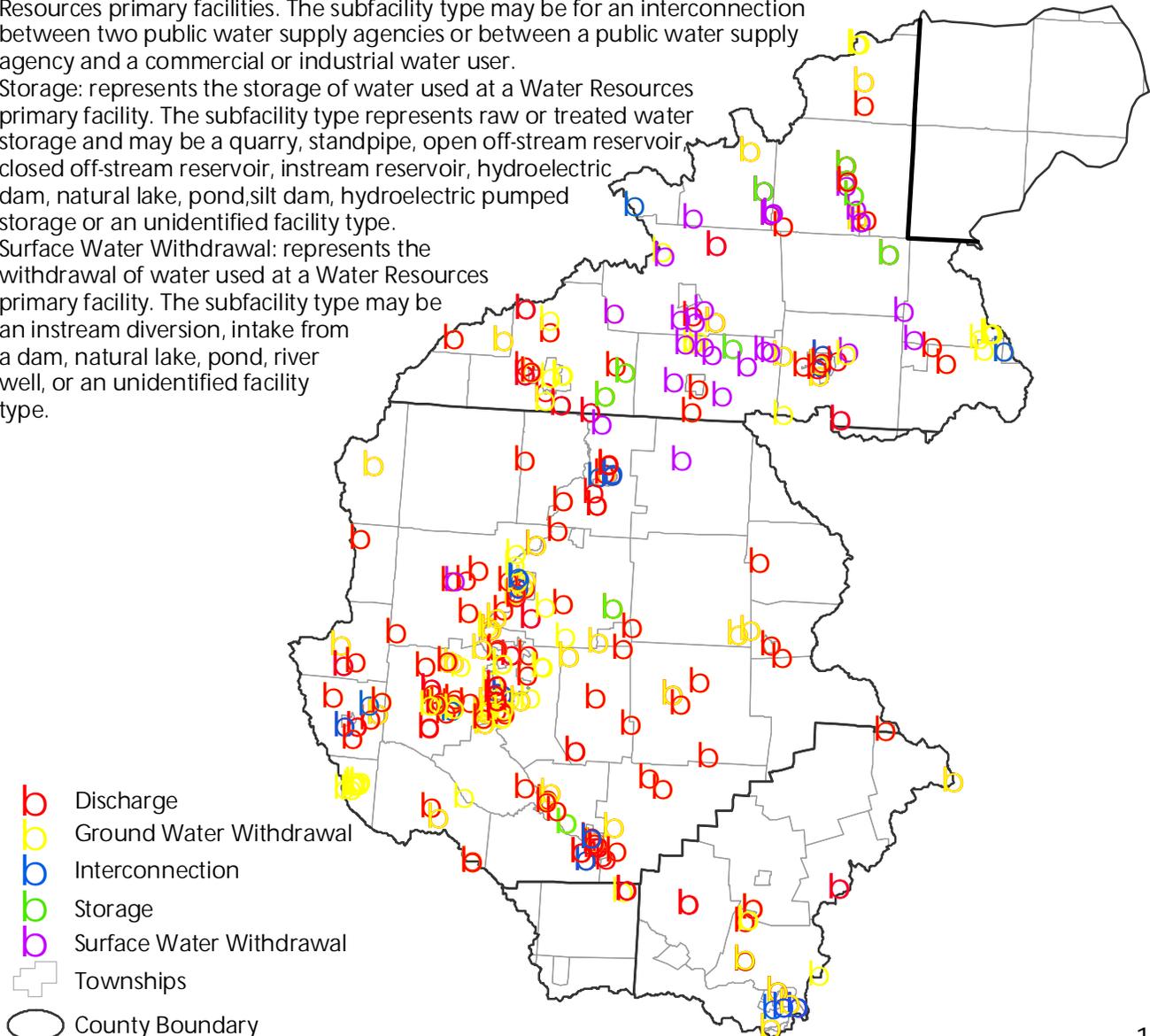
Discharge: represents the return of water used at a Water Resources primary facility. The subfacility type may be a sewage treatment plant, instream discharge, spray irrigation field, groundwater recharge, on-lot septic or an unidentified facility type.

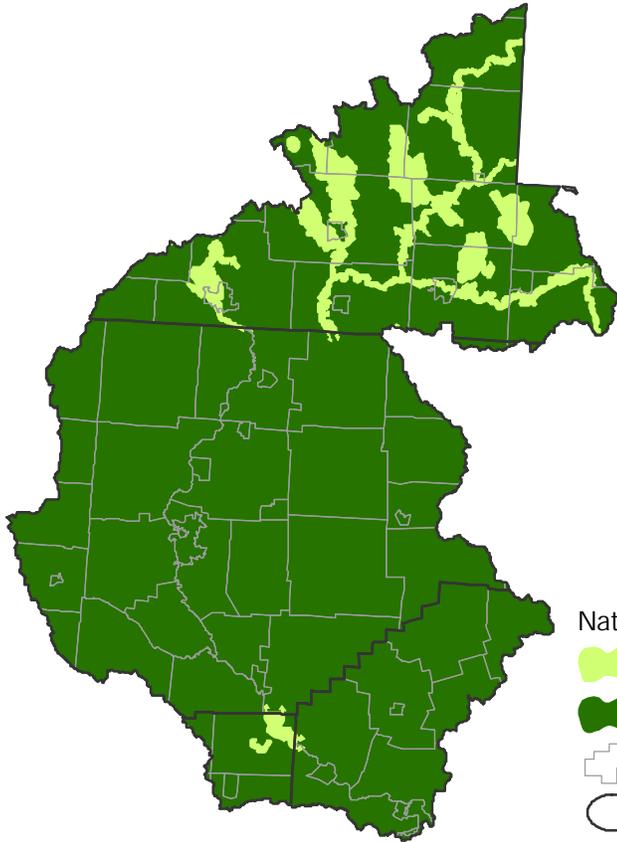
Ground Water Withdrawal: represents the withdrawal of water used at a Water Resources primary facility. The subfacility type may be a well, spring, quarry, infiltration gallery, deep mine, surface mine or an unidentified facility type.

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 Sites¹²

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.

LCA - Landscape Conservation Area - a large contiguous area that is important because of its size, open space, habitats, and/or inclusion of one or more Biological Diversity Areas. Although an LCA includes a variety of land uses, it typically has not been heavily disturbed and thus retains much of its natural character.

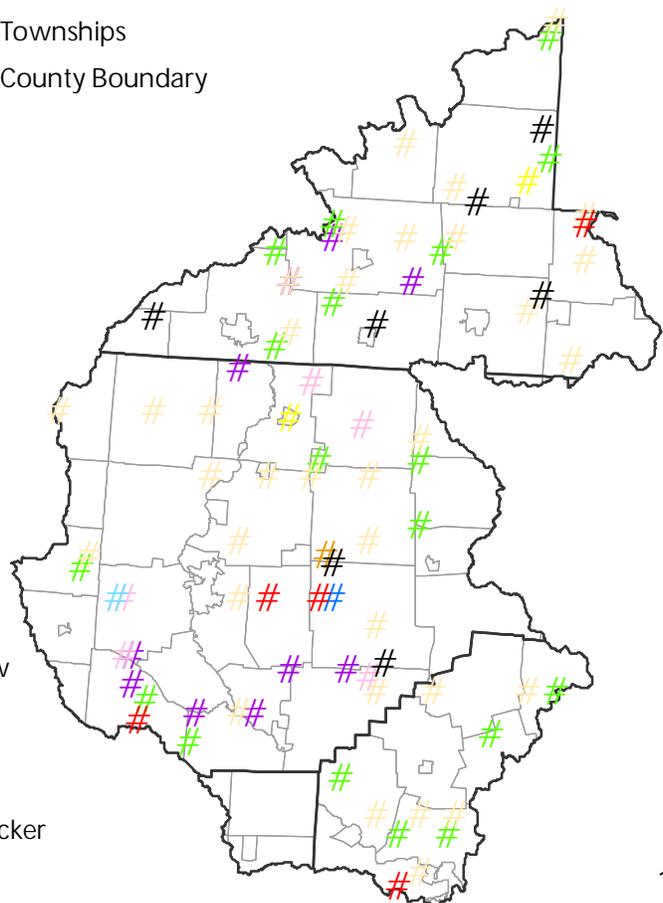
Natural Heritage Inventory Sites

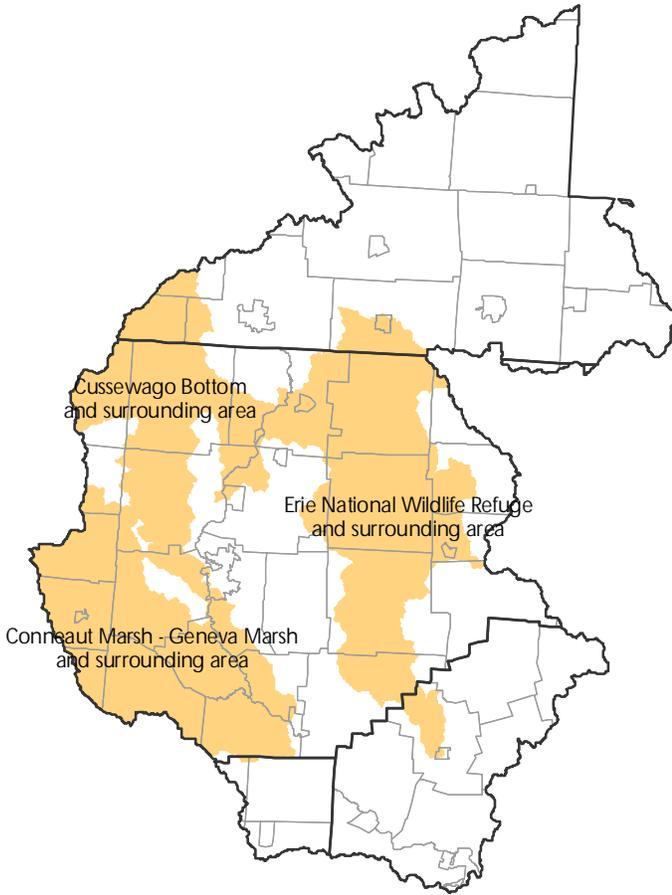
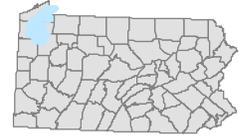
-  BDA
-  LCA
-  Townships
-  County Boundary

Pennsylvania Breeding Bird Atlas¹³

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
-  Eastern Meadowlark
-  Grasshopper Sparrow
-  Henslows Sparrow
-  Marsh Wren
-  Northern Bobwhite
-  Redheaded Woodpecker
-  Townships
-  County Boundary





Important Bird Areas¹⁴

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.

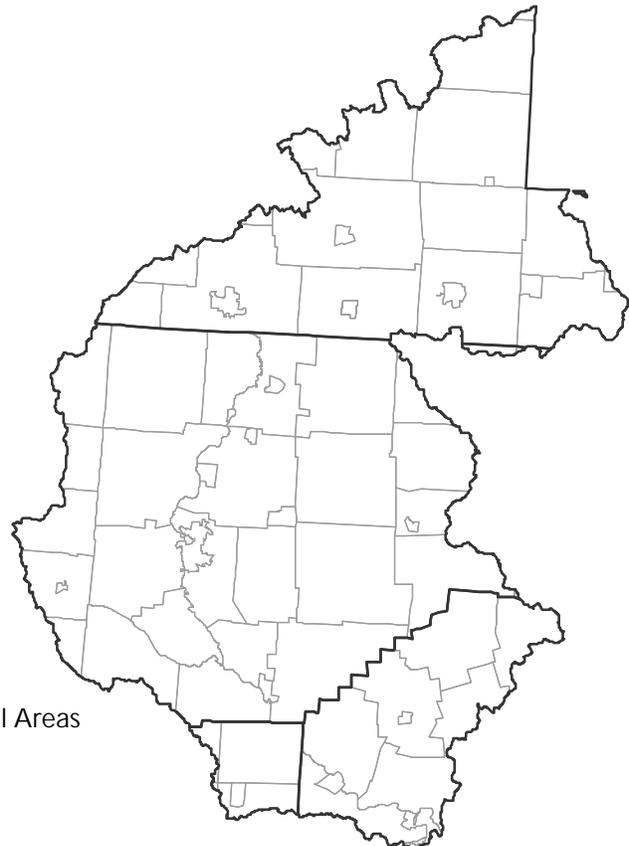
-  Important Bird Areas
-  Townships
-  County Boundary

Important Mammal Areas¹⁵

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.

There are no important mammal areas in the French Creek Watershed.

-  Important Mammal Areas
-  Townships
-  County Boundary

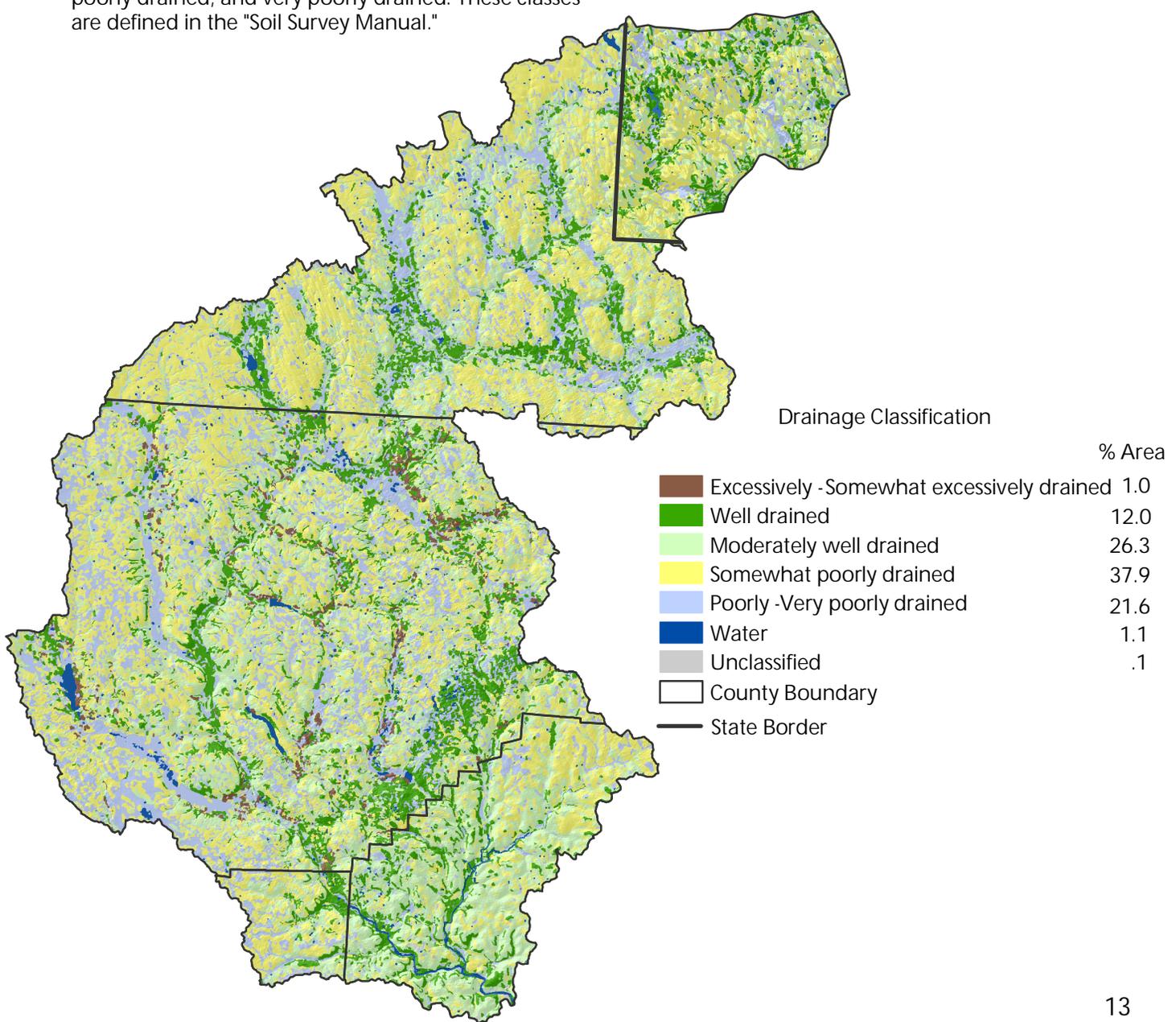


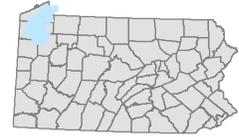
Soils¹⁶



Drainage Classification

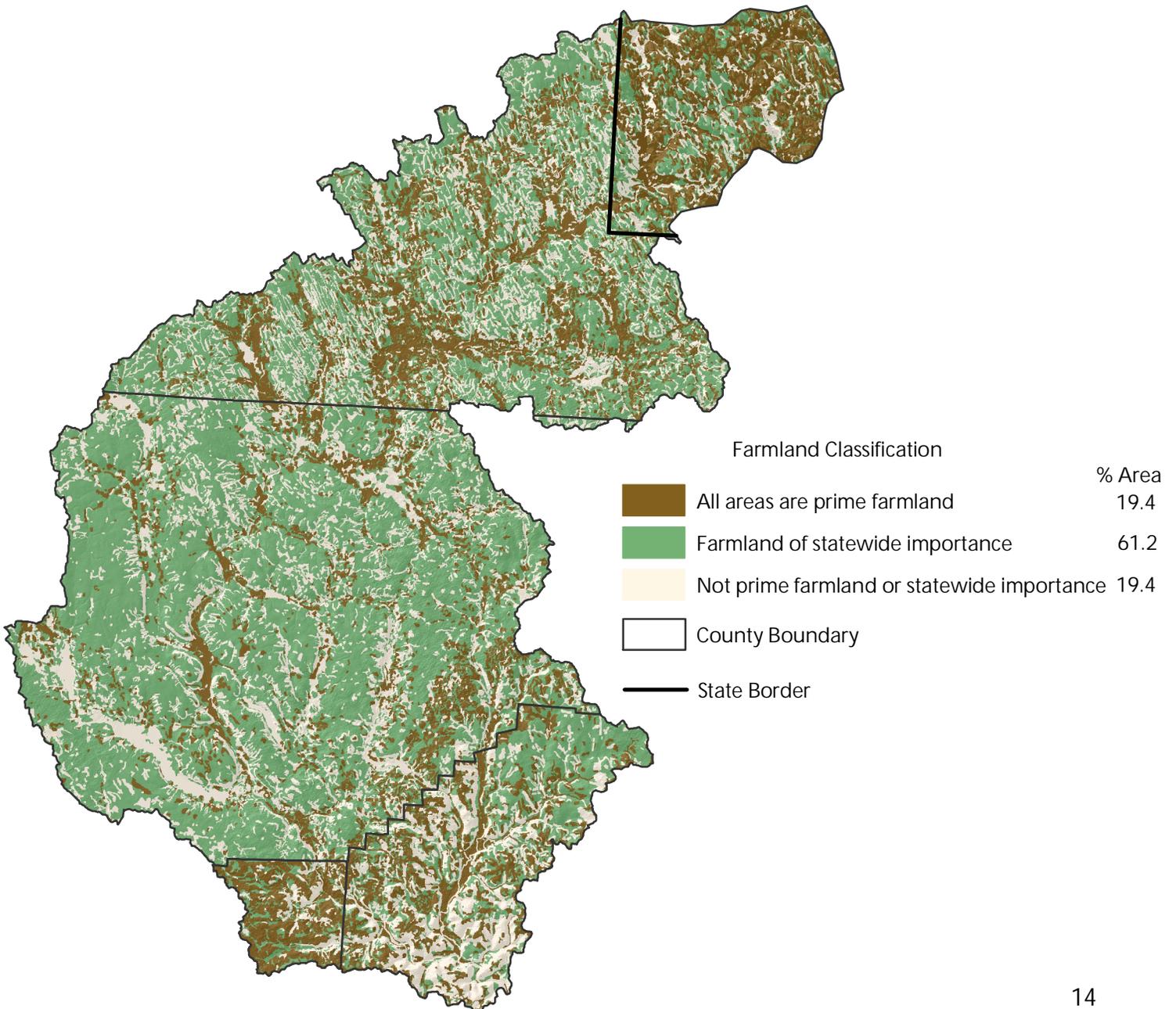
Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology 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."





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.

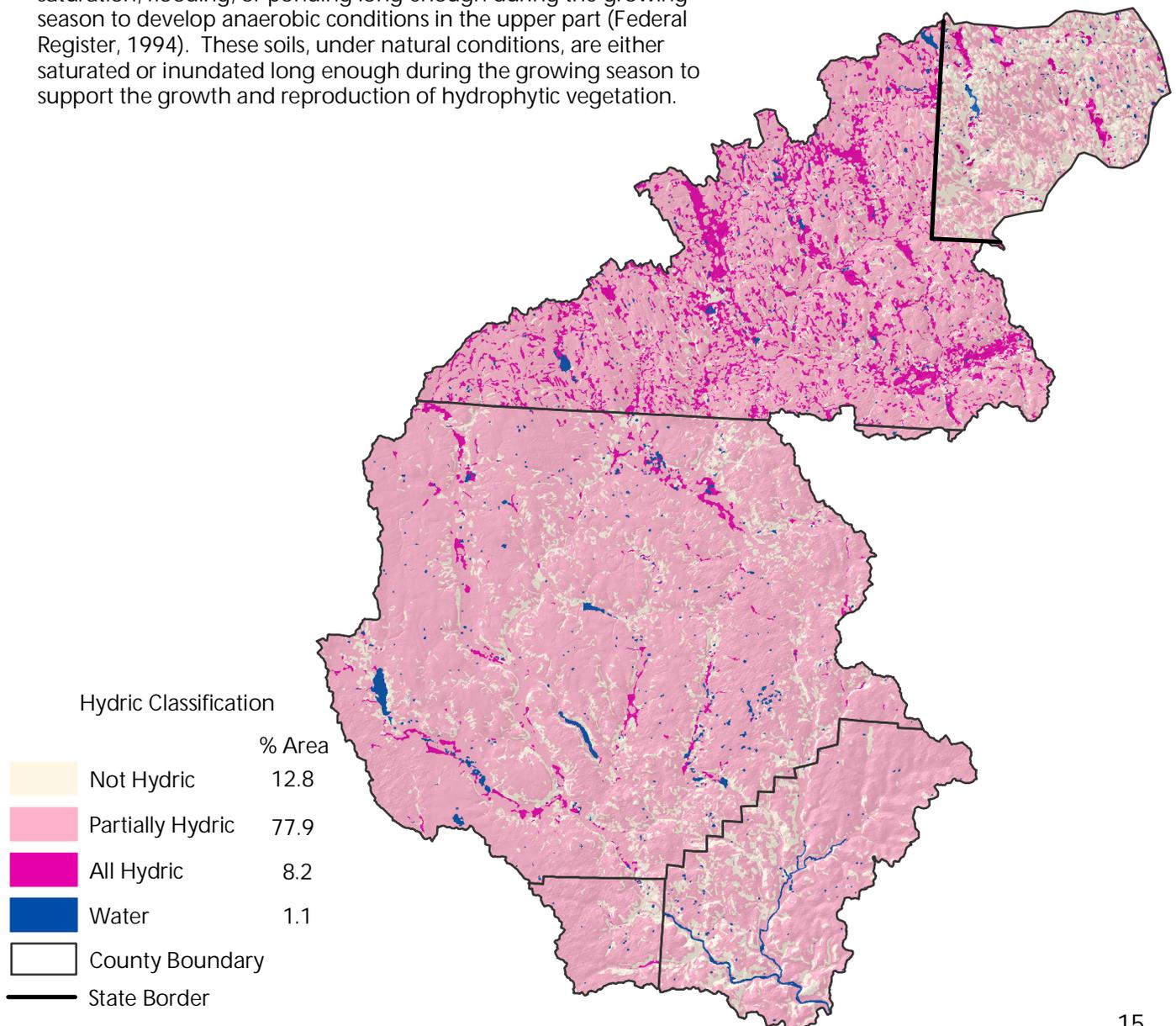


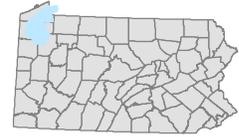


Hydric Soil Classification

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.

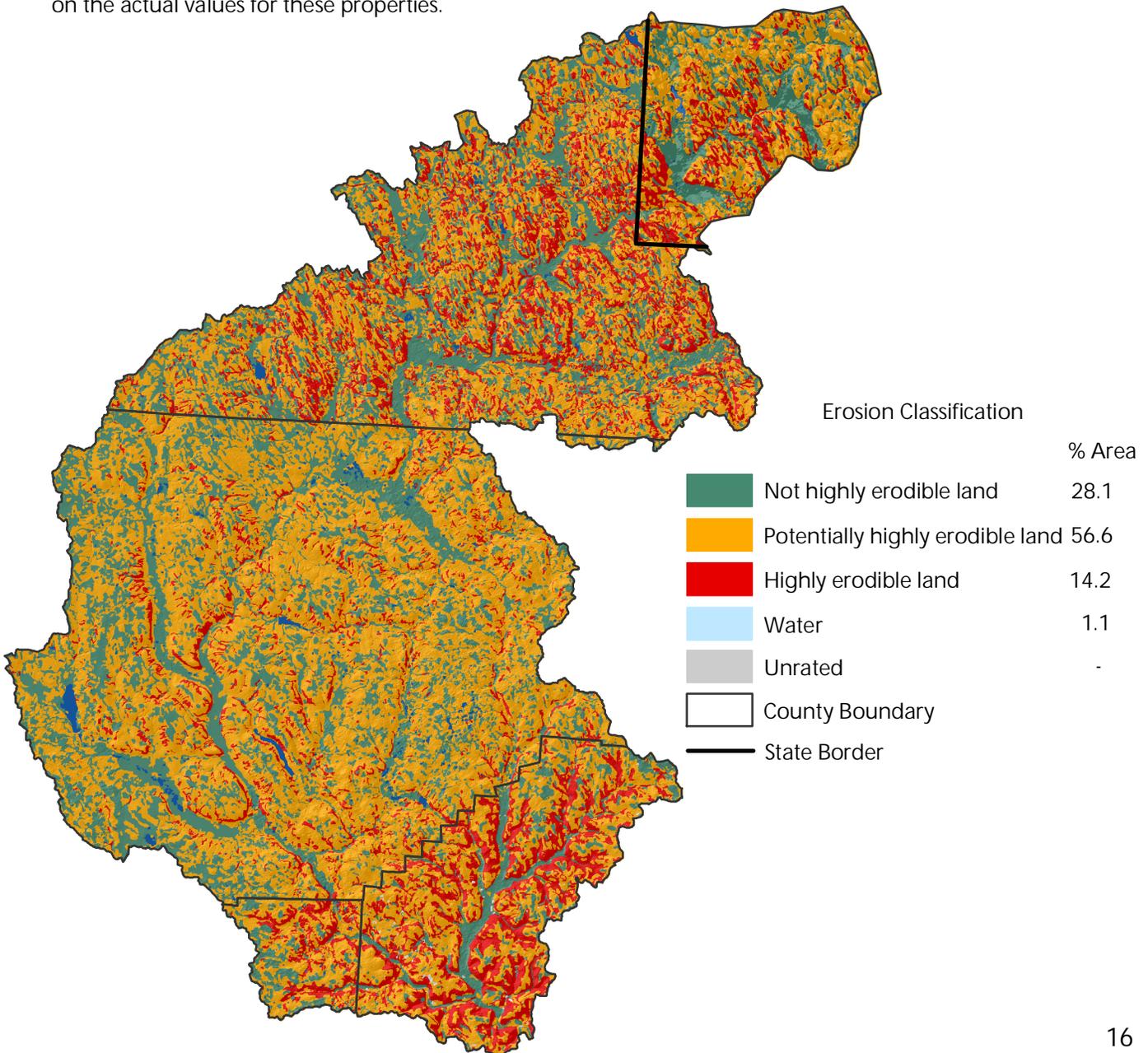
Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural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





Highly Erodible Land

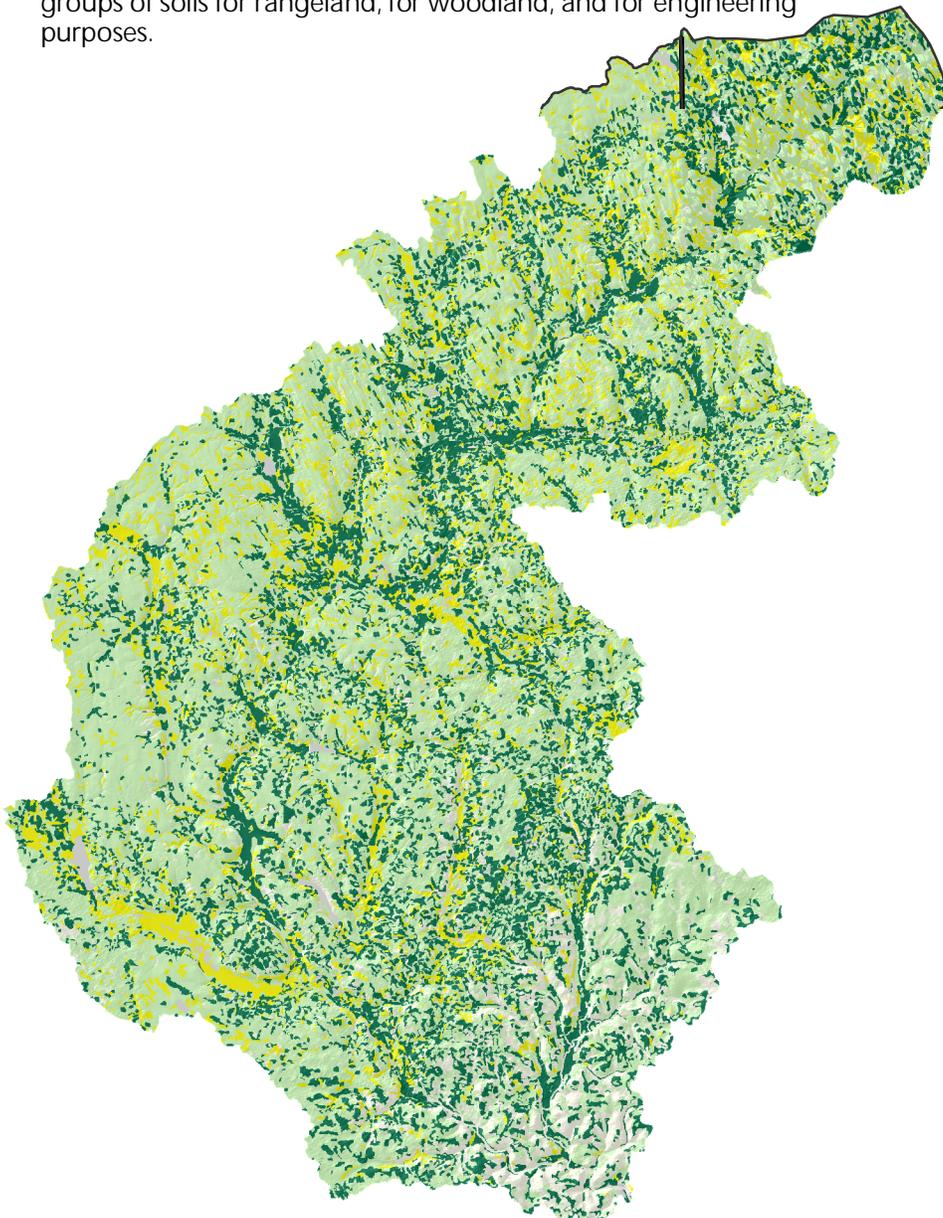
A soil map with an erodibility index (EI) of 8 or greater is considered to be highly erodible land (HEL). The EI for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil in the FOTG as of January 1, 1990. 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.



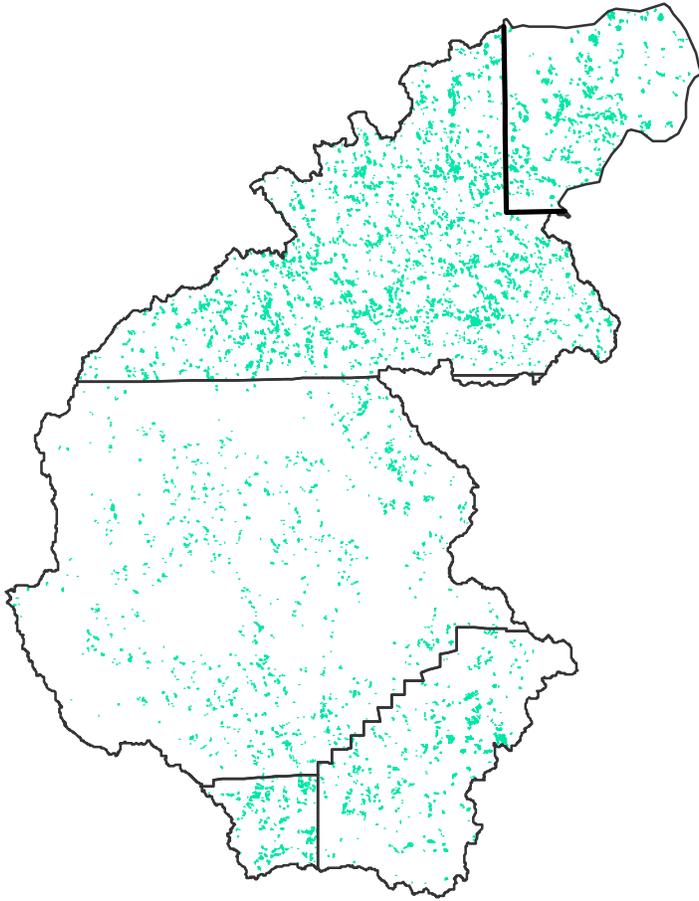
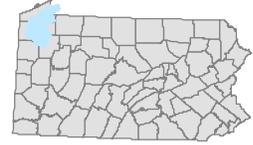


Land Capability Classification

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.

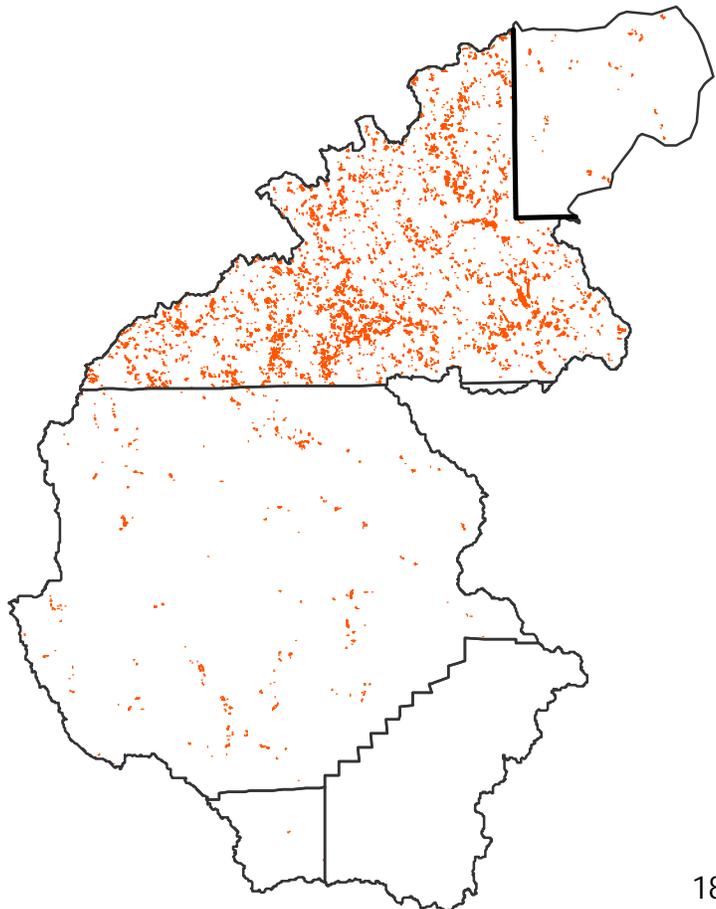


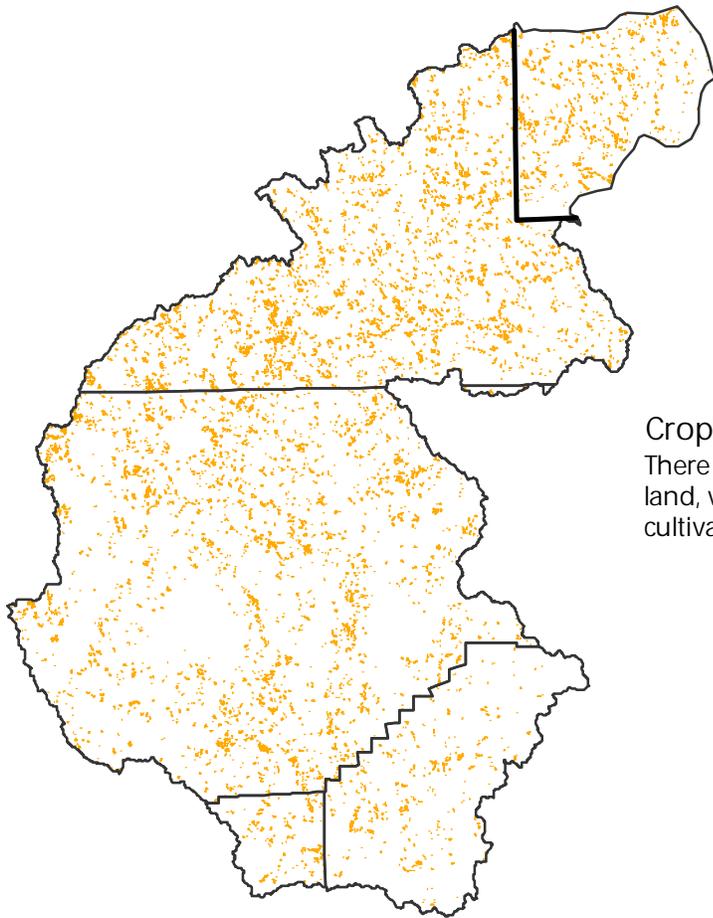
	% Area
1 -2)	22.0
ability Class 3)	58.1
ss 4 -5)	12.5
- 8)	6.3
	1.1



Cropland on Highly Erodible Land
There are 9266.9 acres on highly erodible land, which is approximately 7.6% of all the cultivated cropland in the watershed.

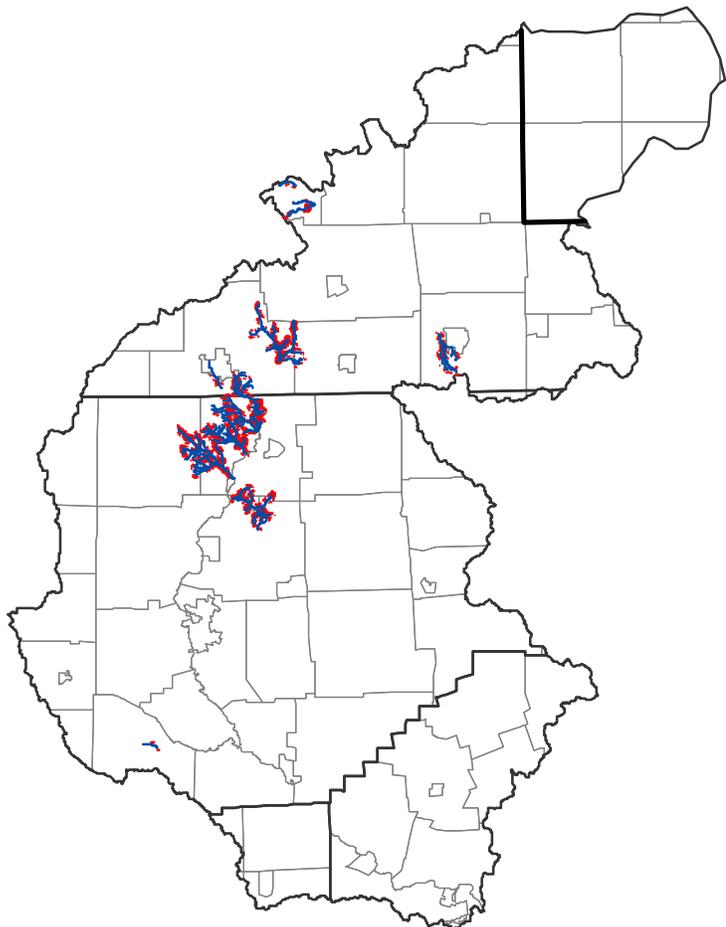
Cropland on Hydric Soils
There are 6219.7 acres on hydric soils, which is approximately 5.1% of all the cultivated cropland in the watershed.





Cropland on Poor or Unsuited Soil
There are 9576.9 acres on poor or unsuited land, which is approximately 7.9% 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
- maintenance of organic matter
- soil productivity
- management of soil moisture
- surface compaction

Conservation Practices

Common conservation practices for cropland:

- contour farming
- crop residue management
- cover crops
- nutrient management
- hayland or grass-legume plantings
- diversions
- grassed waterways
- riparian forest buffers

Common conservation practices for pasture:

- prescribed grazing
- watering systems
- nutrient management
- fencing



PRS Performance Measures ¹⁷

	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Total
Total Conservation Systems Planned (acres)	1812	2743	6530	4660	10,225	NA	8963	10,608	45,541
Total Conservation Systems Applied (acres)	980	1747	3988	4156	6487	NA	6948	9733	34,039
Key Conservation Treatments									
Waste Storage Facility (number)	0	19	22	20	5	4	3	2	75
Riparian Forest Buffer (acres)	4	213	76	126	116	27	53	0	615
Erosion Control Total Soils Saved (tons/year)	1054	1544	1639	719	679	NA	NA	NA	5,635
Nutrient Management (acres)	703	2855	2707	4135	1778	728	1450	4964	19,320
Pest Management (acres)	0	0	0	52	9	15	0	1358	1,434
Prescribed Grazing (acres)	0	342	758	895	406	443	457	986	4,287
Tree and Shrub Establishment (acres)	12	29	24	36	22	23	6	3	155
Residue Management (acres)	217	650	564	342	24	561	1533	1464	5,355
Wildlife Habitat (acres)	431	416	253	320	275	94	1276	740	3,805
Wetlands Created, Restored, or Established	32	27	77	212	64	33	76	35	556
Acres in Conservation Programs									
Conservation Technical Assistance									
Planned	726	1624	3572	3211	8411	NA	6212	4535	28,291
Applied	375	753	2152	2343	4982	NA	5103	2394	18,102
Conservation Reserve Program									
Planned	184	376	1099	254	9	NA	1317	1449	4,688
Applied	330	406	347	24	7	NA	810	859	2,783
Environmental Quality Incentive Program									
Planned	53	659	1376	512	676	NA	2019	803	6,098
Applied	0	47	1414	878	712	NA	1637	2986	7,674
Farmland Protection Policy/Farm and Ranch Lands Protection Program									
Planned	0	20	418	0	464	NA	0	0	902
Applied	0	20	0	0	253	NA	0	0	273
Forestry Incentive Program									
Planned	0	0	60	20	0	NA	0	0	80
Applied	0	0	60	40	0	NA	0	0	100
Grasslands Reserve Program									
Planned				0	0	NA	0	0	0
Applied				0	0	NA	64	0	64
Grazing Lands Conservation Initiative									
Planned	0	438	195						633
Applied	0	283	161						444
Wildlife Habitat Incentive Program									
Planned	60	271	125	59	38	NA	0	0	553
Applied	0	214	106	0	9	NA	7	0	336
Wetlands Reserve Program									
Planned	60	103	82	0	0	NA	15	0	260
Applied	0	103	80	0	0	NA	15	0	198
Conservation Security Program									
Planned								3824	3,824
Applied								3212	3,212

NA - Reporting was unavailable by Hydrologic Unit Code



Social and Census Data ¹⁸

	Crawford	Erie	Venango	Mercer	Chautauqua, NY	Total
Farms (number)	803	572	100	61	128	1,664
Land in farms (acres)	125,746	74,094	13,680	8,051	18,936	240,507
Total cropland (acres)	75,593	47,438	6,842	5,344	11,099	146,316
Principal operator by primary occupation - Farming (number)	458	318	48	34	77	935
Farms by Size						
1 to 9 acres	48	55	6	3	10	122
10 to 49 acres	186	161	25	14	36	422
50 to 179 acres	354	241	49	138	51	833
180 to 499 acres	176	93	16	10	25	320
500 to 999 acres	28	17	3	1	4	53
1,000 acres or more	10	5	1	1	2	19
Livestock and Poultry						
Cattle and calves inventory (farms)	464	242	54	35	48	843
Cattle and calves inventory - Beef cows (farms)	266	156	41	21	19	503
Cattle and calves inventory - Milk cows (farms)	170	76	8	11	23	288
Hogs and pigs inventory (farms)	66	27	13	5	5	116
Sheep and lambs inventory (farms)	31	13	7	4	3	58
Layers 20 weeks old and older inventory (farms)	89	28	12	6	6	141
Broilers and other meat-type chickens sold (farms)	10	4	2	2	1	19
Crops Harvested						
Corn for grain (acres)	12912	7822	1002	1205	665	23,606
Corn for silage or greenchop (acres)	4818	2226	431	336	1107	8,918
Wheat for grain, all (acres)	776	1198	52	148	25	2,199
Oats for grain (acres)	3022	1278	237	278	74	4,889
Barley for grain (acres)	145	87	(D)	15	7	254
Soybeans for beans (acres)	5306	3544	197	466	77	9,590
Forage - land used for all hay and all haylage, grass silage, and greenchop (acres)	32,591	14,819	3,114	1878	5076	57,478
Vegetables harvested for sale (acres)	247	540	20	37	2439	3,283
Land in orchards (acres)	90	5260	10	4	1456	6,820
Total cropland harvested (acres)	5,832	38,316	4,976	4,255	8595	61,974
Farm Operator by Ethnicity						
White	1178	838	146	90	77	2,329
Black or African American	2	0	0	0	0	2
Asian	0	0	0	0	0	0
Hispanic	9	4	1	1	1	16
American Indian/Alaskan Native	2	2	0	0	0	4
Pacific Islander	0	0	0	0	0	0
Women	302	240	39	24	8	613

(D) - Withheld to avoid disclosing data for individual farms



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. 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

8. 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>
9. Total Maximum Daily Load (TMDL)
TMDL is the sum of the individual waste load allocations and load allocations which would not produce a violation of water quality standards. The data used is from 2003, the PA Department of Environmental Protection is currently working on updating the GIS data available. More information can be found on TMDL locations in PA at http://www.dep.state.pa.us/watermanagement_apps/tmdl/, and/or nationally at <http://www.epa.gov/owow/tmdl/>
10. 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>
11. 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>
12. 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/>
13. 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.carnegiemn.org/atlas/home.htm>
14. 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/>
15. 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

16. Soils

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

Crawford County (PA039)

Erie County (PA049)

Mercer County (PA085)

Venango County (PA121)

Chautauqua County (NY013)

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

17. 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/>

18. 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