

Snyder County Implementation Plan:

*For the
Pennsylvania
Chesapeake Bay Tributary Strategy*



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Revised: March 2, 2010

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Notes:

1.) All maps in the report were produced with the assistance of ESRI's ArcView GIS 3.2a, ArcGIS 8.3 or ArcGIS 9.2 computer programs in the Snyder County Conservation District Office, unless otherwise noted. Pie charts and some of the tabulation charts were created with help from geodata and shapefiles listed in the Bibliography, ESRI computer programs and Microsoft Excel and Word programs.

2.) For more detailed maps showing stream impairments and watersheds, please make a request with the Snyder County Conservation District at 10541 Route 522, Middleburg, PA 17842. Office hours: 7:30 a.m. to 4:30 p.m. Phone: 570-837-3000. FAX: 570-837-7300. Email: sccd@ptd.net.

3.) This county implementation plan is in its fourth edition since 2005. It was approved by the Snyder County Conservation District Board of Directors during its regularly scheduled meeting on March 2, 2010.

Executive Summary

Snyder County is heavily involved in agronomic crop and livestock production operations. Livestock numbers have increased greatly from 1987 to 2009. Roughly 38% of Snyder County land is in cropland, pastureland and orchards. U.S. Census information shows that the population has steadily increased over the years since 1960. Estimates show that housing units per square mile are slowly increasing in the county.

A large majority of Snyder County's streams (78%) flow either directly into Middle Creek, Penns Creek or the Susquehanna River. The remaining streams flow either to the Mahantango Creek or the Juniata River.

The Snyder County Conservation District has been involved in many programs with the PA Department of Environmental Protection (DEP) and the Natural Resources Conservation Service (NRCS). They include: Chesapeake Bay, Nutrient Management (Act 38), Erosion & Sedimentation, Project Grass, Dirt & Gravel Roads, Farmland Preservation, Floodplain Management, Environmental Education and Watershed Organization & Education.

Snyder County has 741.194 miles of streams and 380 acres of major lakes within its borders. Approximately 14.98% of all streams (111.055 miles) have had at least one water quality improvement impairment identified by DEP. (DEP has also classified one major lake as impaired.) Thirty-two percent of those impaired streams have at least two problems identified. Over half of the stream impairments are caused by agricultural operations. Another large portion of impairment is caused by non-agriculture sources such as small residential lot runoff and urban runoff.

U.S. Environmental Protection Agency (EPA) models show decreasing levels of nutrients and sediment entering the Chesapeake Bay. Some of these decreases are the result of work through conservation districts and cooperating agencies. However, those same EPA models show that much needs to be done to clean up the Chesapeake Bay to match the desires and requirements of: 1.) The Chesapeake Bay-wide mandatory total daily maximum load (TMDL) due to be established in December 2010, 2.) President Barack Obama's Chesapeake Bay Executive Order issued in May 2009, and 3.) Changes in regulations due to the TMDL and the Executive Order as well as possible future legislation.

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Some identified practices to meet these goals are beyond the scope or function of the Conservation District. However, this Implementation Plan identifies six goals for the Conservation District to reach through current and proposed actions. They are:

1. Reduce soil erosion from agricultural cropland that enters nearby streams.
2. Reduce nutrient pollution from improperly maintained on-lot sewage disposal systems.
3. Reduce nutrient and sediment pollution from entering nearby streams coming from grazing lands.
4. Reduce sediment pollution from excavation and construction sites and unstable streambank segments.
5. Reduce nutrient and sediment pollution from entering streams and ground waters by improving manure management and installing certain practices.
6. Increase public awareness of the importance of watersheds and water quality protection.

To reduce sediment and nutrients from entering the county waterways, the Conservation District is proposing a plan to encourage the public, specifically farmers, homeowners and land developers, to modify their management practices. This is to be done with a combination of 1.) Focusing technical resources on farmers in specific directions, 2.) Finding financial incentives and education resources to encourage farmers, homeowners and others to modify their management techniques and 3.) Enhancing technical staff resources towards erosion control monitoring of land development.

Refer to Table 1 on the next two pages.

It is the hope that the writing of this Implementation Plan will focus the Conservation District staff and directors, current and future, on the task at hand to help Snyder County in its small role to clean its portion of the Chesapeake Bay watershed and the larger role of improving the water quality of the Chesapeake Bay. However, other government agencies, private and non-profit organizations, and the general public must contribute their time, knowledge and finances to assist the conservation district in this task.

Table 1: Summary Chart Showing Goals, How to Achieve Goals, and What to Expect from July 2005 to December 2015

1. Reduce soil erosion from agricultural cropland that enters nearby streams.		
<i>Goal</i>	<i>Goal Achievement</i>	<i>Expected Results</i>
1A. Create a no-till incentive payment program or purchase a no-till drill or planter for crop producing farmers.	1A. Apply for grant money to create no-till incentive payment or purchase a no-till planter or drill for farmers to use. Also apply for staff funding.	1A. Add 2,000 no-till acres within County.
1B. Educate and demonstrate the advantages and techniques of no-till systems.	1B. Apply for education mini-grant money for educational workshops or field demonstrations. May apply for staff funding.	1B. Add 500 no-till acres within County.
1C. Write more agricultural conservation plans for farmers.	1C. Apply for grant money to fund staff time to write additional conservation plans needed for CAOs, farms within agriculturally impaired watersheds, and other farmers.	1C. Update 4,000 acres of conservation plans
1D. Increase the number of cover crops planted.	1D. Meet with farmers regarding importance of cover crops. May apply for incentive program and staff funding.	1D. Add 1,000 acres of cover crops.
1E. Educate and demonstrate the need for conservation plans and soil erosion prevention implementation on farmland toward farmers who do not traditionally work with government agencies.	1E. Apply for grant money for educational workshops for field demonstrations for agricultural erosion control and regulation compliance.	1E. Reduce the amount of agriculturally impaired streams by 2 miles within County.
2. Reduce nutrient pollution coming from improperly maintained on-lot sewage disposal systems.		
<i>Goal</i>	<i>Goal Achievement</i>	<i>Expected Results</i>
2A. Create an educational and incentive payment program for homeowners in order to maintain their on-lot sewage disposal systems properly.	2A. Apply for grant money to create an educational and incentive payment program to increase awareness and improve on-lot sewage disposal system maintenance.	2A. Reduce the amount of nutrient impaired streams by 0.5 miles within County.
3. Reduce nutrient and sediment pollution from entering nearby streams coming from grazing lands.		
<i>Goal</i>	<i>Goal Achievement</i>	<i>Expected Results</i>
3A. Install streambank fencing and riparian buffers in livestock pastures and encourage better grazing management.	3A. Utilize existing DEP and Project Grass funding sources. May apply for additional funding.	2A. Add 2 miles of streambank fencing, 50 acres of riparian buffers and convert 100 acres into intensive grazing.

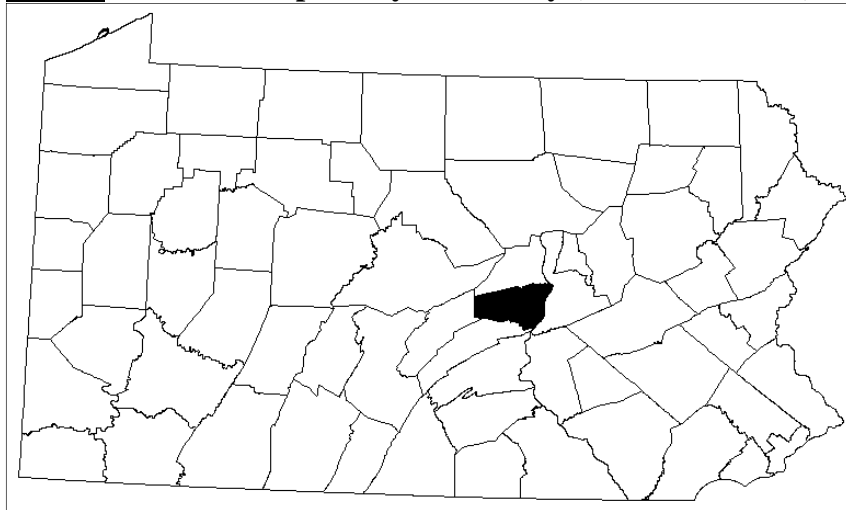
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4. Reduce sediment pollution from excavation and construction sites and unstable streambank segments.		
<i>Goal</i>	<i>Goal Achievement</i>	<i>Expected Results</i>
4A. Increase staff personnel time to review and inspect the increasing number of expected excavation and construction sites.	4A. Monitor excavation site numbers. Reorganize staff personnel priorities or apply for funds to hire additional staff.	4A. Review and inspect 150 erosion & sedimentation plans and sites for 500 acres of earth disturbance.
4B. Install riparian buffers and stabilize streambanks to reduce sedimentation.	4B. Identify and stabilize critical streambank sites. Seek funding for design and installation	4B. Identify critical sites and stabilize 1 mile of streams.
5. Reduce nutrient and sediment pollution from entering streams and ground waters by improving manure management and installing certain practices.		
<i>Goal</i>	<i>Goal Achievement</i>	<i>Expected Results</i>
5A. Install additional milkhouse wastewater treatment systems.	5A. Apply for funding to install milkhouse wastewater treatment systems. Also apply for staff funding.	5A. Install 6 milkhouse wastewater treatment systems serving 350 animal equivalent units (AEUs).
5B. Install additional best management practices (BMPs) to manage animal waste.	5B. Utilize EQIP and Act 38 grant funds. May also apply for additional funds.	5B. Install 12 animal waste BMPs (barnyards & storages) serving 1,200 AEUs.
5C. Educate and demonstrate the need for nutrient management on farmland toward farmers who do not traditionally work with government agencies.	5C. Apply for grant money for educational workshops for field demonstrations for agricultural manure and nutrient management and regulation compliance.	5C. Reduce the amount of agriculturally impaired streams by 1 mile within County.
5D. Encourage environmentally and agronomically sound decisions regarding nitrogen applications from manure and chemical fertilizers.	5D. Apply for grant money for educational workshops, mileage, and/or one-on-one training with interested farmers by offering pre-nitrogen chlorophyll meter service on corn fields.	5E. Reduce the amount of agriculturally impaired streams by 1 mile within County.
5E. Install vegetative stream buffers (minimum 35 ft.) for crop fields that receive animal manure.	5E. Apply for grant money for educational workshops, buffer installation incentive programs, buffer rental payment programs, and/or buffer maintenance payment programs.	5E. Increase vegetative buffer acreage by 25 acres or along 5 miles of streams.
6. Increase public awareness of the importance of watersheds and water quality protection.		
<i>Goal</i>	<i>Goal Achievement</i>	<i>Expected Results</i>
6A. Educate youth in school activities and the general public on importance of water quality protection and watersheds.	6A. Apply for educational grants for educational materials and promotion to school students and the general public.	6A. Educate 1,000 students and 350 adults in workshops and other activities related to water quality and watershed protection.
6B. Create new watershed associations within County.	6B. Apply for grants and other funds for promotion and creation of new watershed associations.	6B. Create one new watershed association.

County Description

Snyder County is located in central Pennsylvania, bordered by the Susquehanna River on the east. (Refer to Map 1) There are fifteen townships and six boroughs within Snyder County. (Refer to Map 2) Its 332 square miles (211,000 acres) are located in the Valley and Ridge physiographic province. Mountains and steep hills make up most of the county, but some broad, sloping or nearly level areas can be found in the county's central valleys and along the Susquehanna River. At least half of the county (112,000 acres) is forested. (Refer to Table 2 on the next page.) (SCS, 1985, NASS-PA, 2004)

Map 1: Location Map of Snyder County (Shaded in Black)



Map 2: Map of Snyder County Municipalities

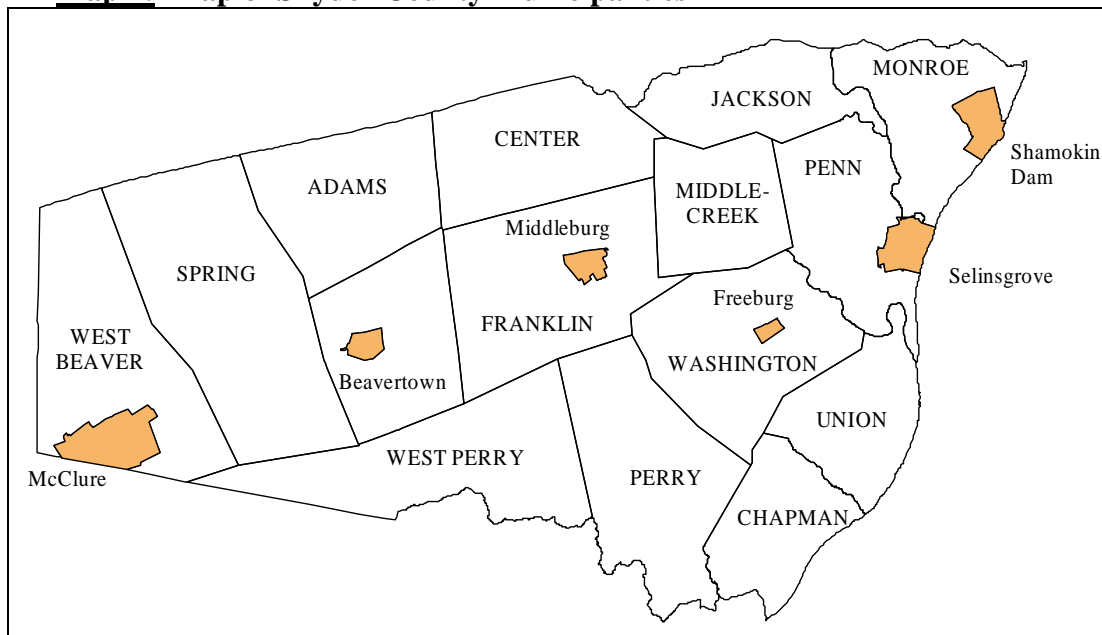


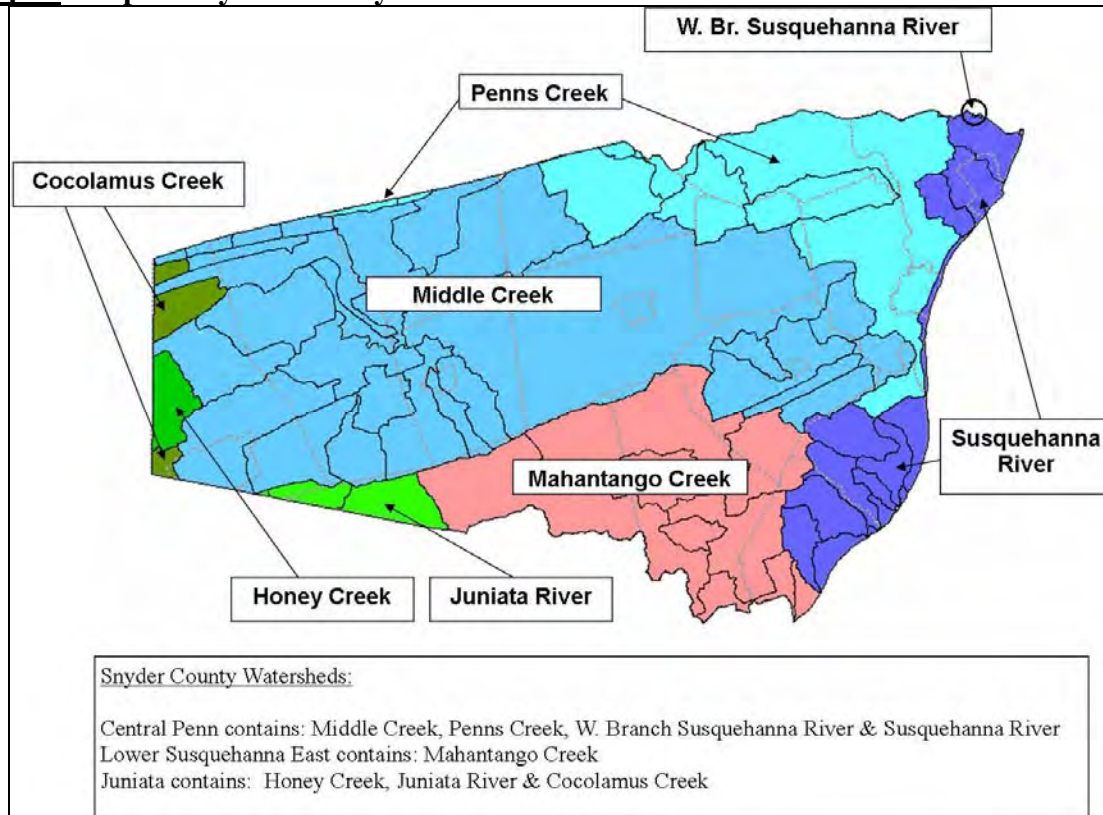
Table 2: Percentage & Acreage of Land Uses Within Major Watersheds

Land Use Description: (Acres in Parentheses)	Central Penn: <i>Titled Middle Creek and Penns Creek Land Use: (Also includes West Branch Susquehanna River and Susquehanna River</i>	Lower Susquehanna East and Juniata: <i>Titled Mahantango Creek Land Use (Does not includes Honey Creek and Cocolamus Creek)</i>
Forestland	55% (92,653 acres)	55% (20,625 acres)
Cropland	33.6% (56,630 acres)	33% (12,375 acres)
Pastureland	4.7% (7,950 acres)	4.8% (1,800 acres)
Other	6.7% (11,224 acres)	7.2% (2,700 acres)

(Other: Includes urban land, idle land, orchards, water)

There are three major watersheds identified by PA Department of Environmental Protection within Snyder County: Central Penn, Lower Susquehanna East and Juniata (PA-DEP, 2004). (Refer to Maps 3 and 4) All of them are within the designated Lower Susquehanna Watershed Region of the recent PA State Water Plan. (PA-DEP, Water Plan 2009) These watersheds are divided into smaller watersheds, which are listed below with acreage percentage within Snyder County (Chesapeake Bay Program, 2004). Also refer to Table 3 on the next page.

Map 3: Map of Snyder County Watersheds



Map 4: Major Watersheds in Relation to Snyder County (Snyder County in Green)

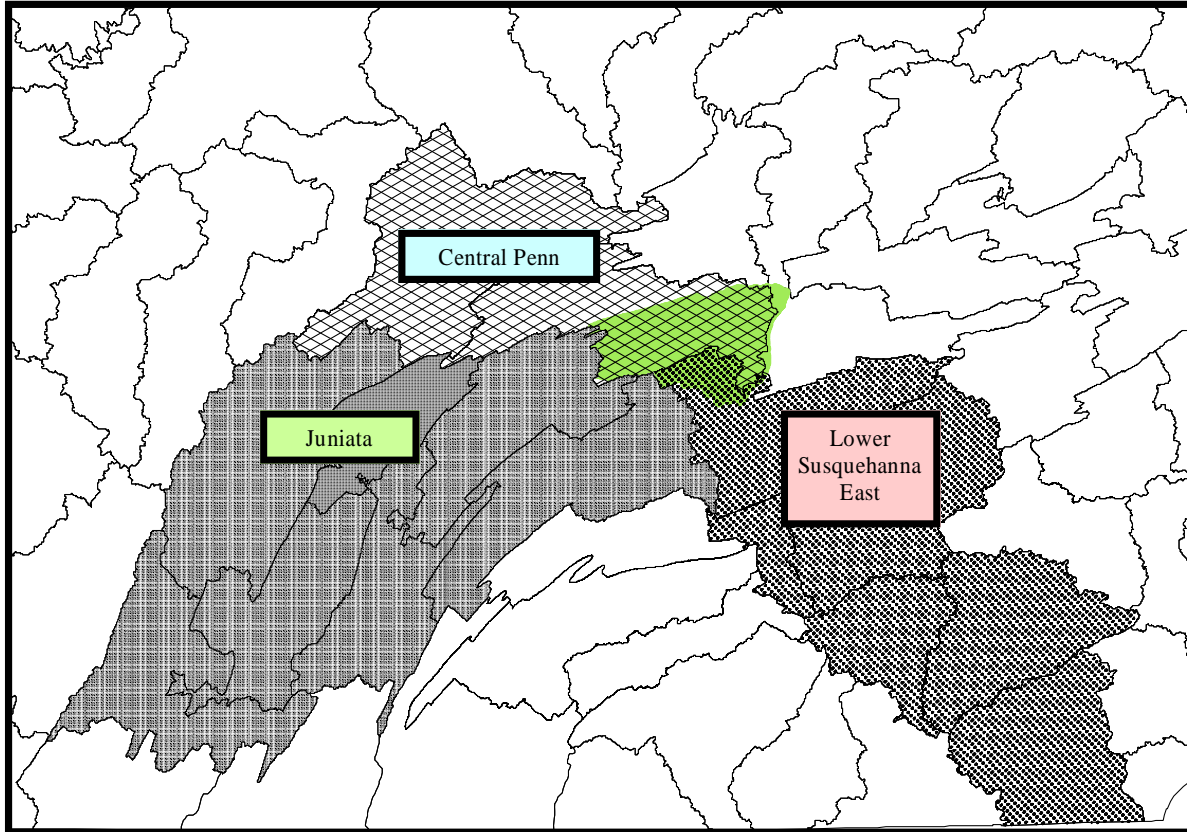


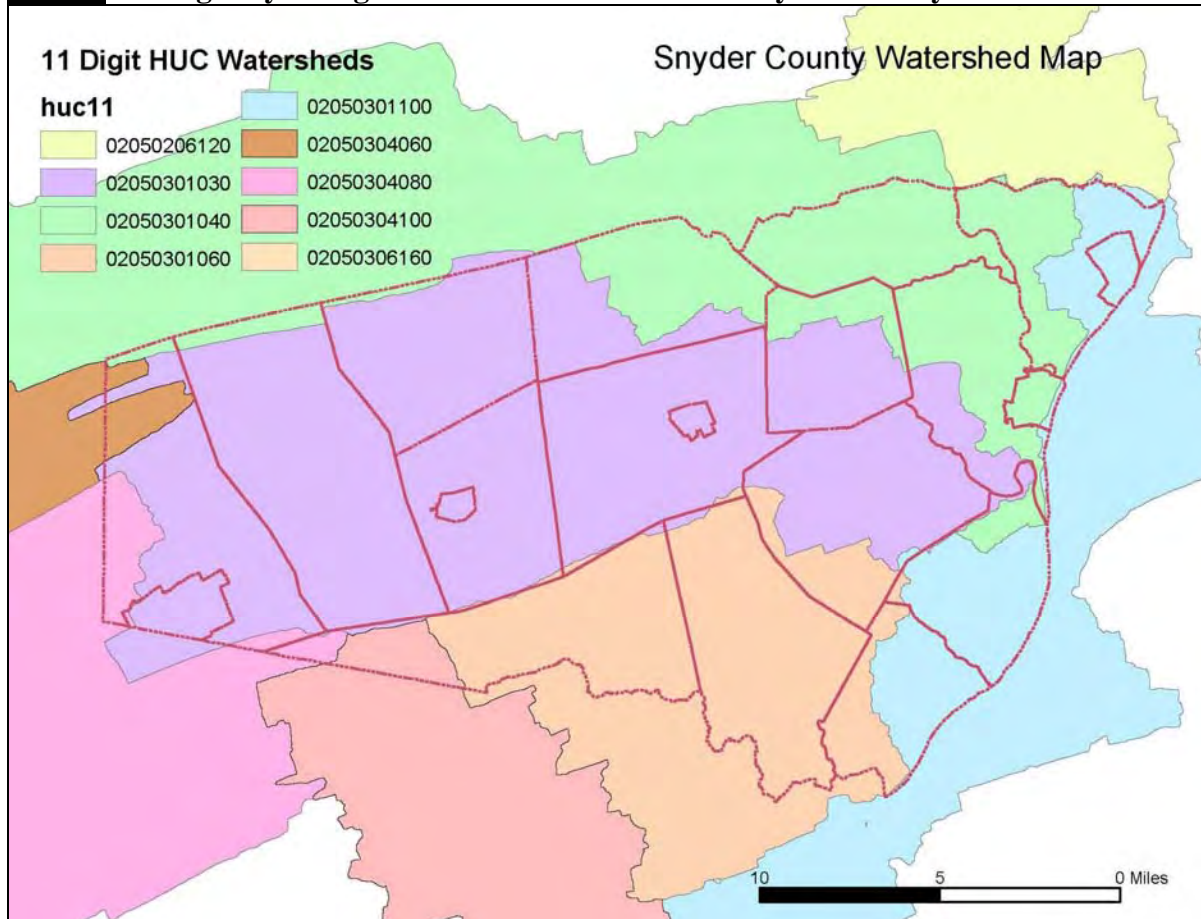
Table 3: Percentage of Snyder County within Major Watersheds & Sub-Watersheds

Major Watershed	Sub-Watershed Name	Percent within Snyder County
Central Penn	Middle Creek	51.40
	Penns Creek	18.03
	West Branch Susquehanna River	0.02
	Susquehanna River	8.62
		Total: 78.07
Lower Susquehanna East	Mahantango Creek	17.75
		Total: 17.75
Juniata	Honey Creek	1.07
	Juniata River	1.91
	Cocolamus Creek	1.19
		Total: 4.17

(Percentages do not add up to 100.00%)

The following map shows the county divided according to hydrologic unit codes (HUCs) identified by U.S. Geological Survey (USGS). Polygons for the map supplied by Susquehanna River Basin Commission to the Conservation District in 2006 and originated by (USGS & NRCS, 2002).

Map 5: 11-Digit Hydrologic Unit Code Watershed in Snyder County



As a rural county, urban land makes up only 7,000 acres of the entire county (SCCD, 1987 Plan). Consistent with prior assessments, today's land uses, within the county's major watersheds, remain nearly unchanged. (SCCD, 1987 Assessment and SCCD, 1988 Assessment)

Like other sections of central Pennsylvania, the population of Snyder County has been growing steadily since the 1960's figure of 29,522 (Snyder Co. Planning Commission, 2001). Listed on Tables 4a and 4b are statistics from the U.S. Census Bureau's website regarding the 2000 Census and subsequent estimates for Snyder County (US Census Bureau, December 2004, US Census Bureau, January 2010):

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Table 4a: Year 2000 Census Information for Snyder County

Geographic Area	Population	Housing Units	Area in Square Miles			Density per Square Mile of Land Area	
			Total Area	Water Area	Land Area	Population	Housing Units
Snyder County	37,546	14,890	332.16	0.95	331.20	113.4	45.0

Table 4b: Annual Estimates of the Resident Population for Snyder County, Pennsylvania: July 1, 2001 to July 1, 2008

July 1, 2008	July 1, 2007	July 1, 2006	July 1, 2005	July 1, 2004	July 1, 2003	July 1, 2002	July 1, 2001
38,074	38,149	38,049	37,775	37,959	37,893	37,796	37,744

Listed below is information regarding school district student enrollment within the County. These numbers do not include information from Amish or Mennonite schools. (SCCD, 1987 Assessment, SCCD, 1988 Assessment and PA Dept. of Education, January 2009 Revision)

Table 5a: Total Enrollment Comparison of Snyder County School Districts in the 1990s.

School District	Total Enrollment	
	1990-91	1998-99
Midd-West	2,622	2,703
Selinsgrove Area	2,743	2,985

Table 5b: Total Enrollment & Projection Comparison of Snyder County School Districts between 2007-08 and 2017-18.

School District	Total Enrollment	
	2007-08	2017-18
Midd-West	2,254	2,508
Selinsgrove Area	2,720	2,787

Agriculture is very prevalent within Snyder County’s history, culture and economic well being. Listed on Table 6 are statistics taken from the following sources: 2006 through 2009 Pennsylvania Agricultural Statistics Annual Summaries website data (NASS-PA, 2010), 2008-2009 Pennsylvania Agricultural Statistics Annual Summary (NASS-PA, 2009) and 2007 Census of Agriculture Pennsylvania State & County Profiles (NASS-PA, Updated December 2009).

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Table 6: Snyder County Agricultural Facts

Total Land Farmed	99,000 acres
Harvested Field & Forage Crops	50,100 acres
Vegetable Crops Harvested	572 acres
Number of Farms	997
Dairy Farms	153
Hog Farms	72
Poultry Farms	167
Cattle Farms	438
Sheep Farms	70
Goat Farms	113
Value of Field & Forage Crop Production (\$18,886,000.00
Value of Vegetable Crop Production	\$2,799,000.00
Value of Fruit Production	\$2,196,000.00
Value of Cattle & Calves on Farms (2009)	\$26,322,000.00
Value of Hogs & Pigs	\$12,538,000.00
Value of Sheep & Lambs	\$68,000.00
Value of Milk Production	\$27,000,000.00

Rank in PA Products (Among all PA Counties):

Broilers Produced (a)	2 nd (2007)/3 rd
Hogs & Pigs	8 th
Apples	5 th
Cash Receipts, not including Government Payments	10 th

All 2008 unless otherwise noted.

(a) 2008-2009 Pennsylvania Agricultural Statistics Annual Summary has Snyder County ranked 3rd, 2007 Census of Agriculture Pennsylvania State & County Profiles ranks Snyder County 2nd.

Snyder County Conservation District also participates in the following agricultural and water quality programs (listed in Table 7 on the next page) in conjunction with PA Department of Environmental Protection, PA Department of Agriculture, PA Department of Community & Economic Development and State Conservation Commission. The Conservation District also works with the Natural Resources Conservation Service with local and federal programs. Please see Table 7 for a list of Conservation District programs. (SCCD, January 2005, SCCD, December 2005, SCCD, December 2006, NRCS, December 2005, SCCD, February 2010 and NRCS, February 2010)

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Table 7: Snyder County Conservation District Programs Facts

Ag. Conservation Program	Description of Accomplishments
Nutrient Management Program (Act 38, formally Act 6)	<ul style="list-style-type: none"> • 73 CAO (concentrated animal operations) and Volunteer Plans in Snyder County (47 CAOs) • \$590,000 cost share grant money to farmers • Increase Act 38 staff to 1.5 staff persons.
Chesapeake Bay Program (1987-2005)	<ul style="list-style-type: none"> • 44 Contracts since 1987 • \$935,000 in Contracts since 1987
Chesapeake Bay Special Projects (Since 2005, CBSP)	<ul style="list-style-type: none"> • No-Till Incentive Payment Program (2006-2009), 954.3 acres • Cover Crop Incentive Payment Program (2007-2009), 775.2 acres • Chlorophyll corn nitrogen testing (2007-2009), 839.6 acres • Maintain a no-till planter/drill database, (Since 2007), 11 planters & drills • 1 improved barnyard (2008) • Available funds for pasture improvements and agricultural consulting.
Farmland Preservation	<ul style="list-style-type: none"> • 21 farms preserved since 1992 • Over \$2 million in easements
<p>Other Conservation District Programs & Assistance:</p> <ul style="list-style-type: none"> • Erosion & Sedimentation (Level 2) – 179 plan reviews, 68 NPDES permits (2003-2009) • Dirt & Gravel Roads (4 municipalities since 2000, spent \$256,000) • Watershed Protection Organization & Education (1 group created, 100 rain barrel kits given in 2008, 225 rain barrels distributed in 2009) • Project Grass for Rotational/Intensive Grazing improvements (3 projects, 130.9 acres improved, some with CBSP) • Educate youth on conservation and environmental education (e.g.: Mid-West School District Outdoor Education Program, West Snyder Middle School students) • Work with DEP on inspection of 10 CAFOs within Snyder County (Non CD Program) • Participate in the floodplain management monitoring program. • Conducted 2 no-till field day events in 2006 and 2009 with CBSP and PA Association of Conservation Districts, Inc. grants. • 48 On-Lot septic pumpouts & 5 workshops regarding on-lot septic maintenance with CBSP. • Conservation plan writing, base maps (4,900 acres) for nutrient balance sheets. • Installed 17.4 acres of riparian buffer in Snyder County with 2009 American Recovery & Reinvestment Act funds. • Installed 370 ft. of urban streambank stabilization. 	
<p>Assist with NRCS Programs:</p> <ul style="list-style-type: none"> • Help promote programs such as Environmental Quality Incentive Program (EQIP) and Chesapeake Bay Watershed Initiative (CBWI). 	

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It should be noted that the Conservation District had issued general permits in the past. Due to financial and workload issues, general permits are now given by the PA DEP's Northcentral office in Williamsport.

Since Snyder County is rural, it should not be a surprise that there is a large percentage not connected to a public sewage disposal system. According to information gathered from the "1999 PA County Data Book: Snyder County," roughly 50% of housing units have on-lot sewage disposal systems. That means that the landowner, not a professionally trained treatment plant employee or manager, must make sure that their own system is functionally correct and not polluting nearby water resources. (Snyder Co. Planning Commission, 2001)

Water Resources & Quality

Snyder County has 741.194 miles of streams and two major recreational lakes (Walker and Faylor) consisting of 380 combined acres (PA-DEP, October 2009a and October 2009b and SCCD, January 2005). In Title 25 (Environmental Protection), Chapter 93 of the PA Code, sections 93.2 and 93.3 sets forth water quality standards for the state based on water uses “which are to be protected and will be considered by the Department (of Environmental Protection) in its regulation of discharges.” (25 PA Code, §93.2, §93.3, §93.4) DEP is mandated by the U.S. Environmental Protection Agency (EPA) to set water quality standards for all waters within the state under the U. S. Clean Water Act of 1972 and subsequent amendments to the law. (NEDC, 1998)

Within Snyder County, uses of its waterways vary from “warm water fishes” (WWF) of the lower section of Penns Creek, to “trout stocking” (TSF) of the lower section of North Branch Mahantango Creek, to “cold water fishes” (CWF) of Swift Run that flows into North Branch Middle Creek. (Note: Several streams are rated HQ, “high quality,” in the county. Some of the HQs are designated for migratory fish, “MF.”) Waterways range in size from the unnamed run that eventually flows into a small creek to the main stem of the Susquehanna River. (25 PA Code, §93, 2005 and 2010) Map 6 shows the approximate locations of HQ and other streams in the county. (PA-DEP, December 2009)

Map 6: Type of Streams According to Title 25, Chapter 93, Water Quality Standards



Legend: Blue = HQ-MF (High Quality-Migratory Fish), Purple = HQ (High Quality), Green = CWF (Cold Water Fishes), Orange = TSF (Trout Stocking), Red = WWF (Warm Water Fishes)

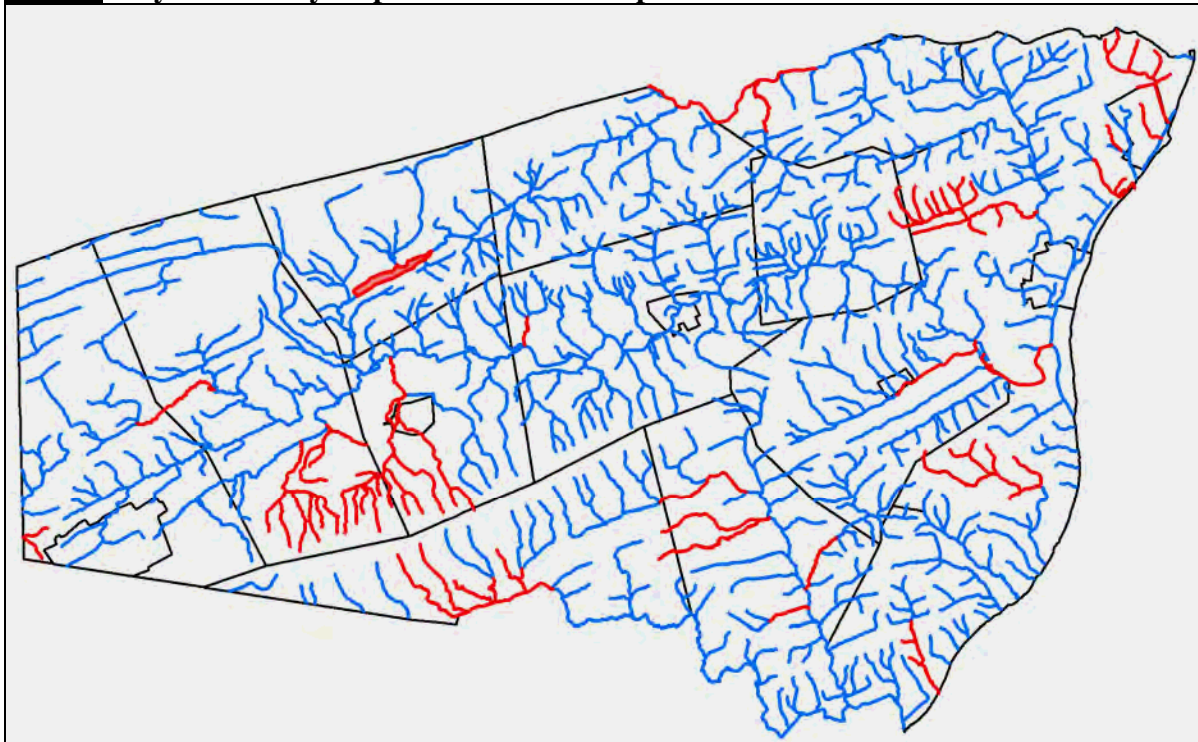
The PA Department of Environmental Protection (DEP) has identified water quality impairment problems within the county. Practically all streams have been assessed at this time, most of the problems have been identified by several methods under the U.S. Environmental Protection Agency's (EPA) guidance within federal Clean Streams Laws.

Identified Impaired Streams

According to DEP's eMap PA Access website, there are many section 305(b) impaired waterbodies identified within Snyder County. This report uses spatial data supplied by DEP in the making of these maps (PA-DEP, December 2009). Since the maps were done on ArcGIS, some stream segments may not exactly match stream segments on DEP's eMap PA Access. (PA-DEP, January 2010 website) Please refer to the following maps for locations of 305(b) impaired streams. This information was verified from DEP's 2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Additional information was also found on DEP's website (PA-DEP, January 2010 website) and non-attaining GIS streams information (PA-DEP, October 2009b).

The streams shown on the following four maps are from either DEP's spatial data, DEP's eMap PA website other reports mentioned later in this report. (PA-DEP, October 2009a and 2009b, PA-DEP, January 2010 website, and Aqua-Link, 2003)

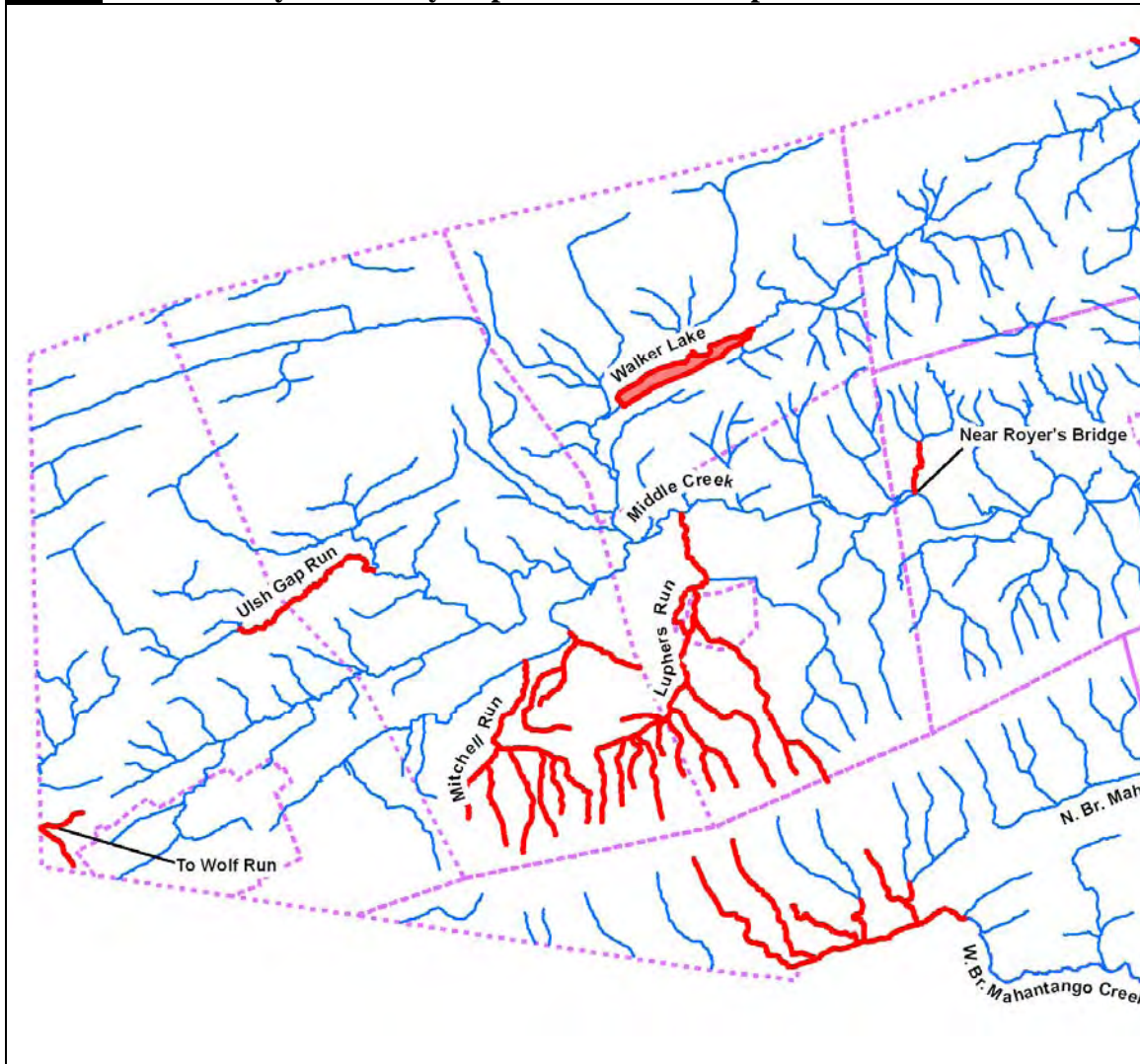
Map 7: Snyder County Impaired Streams Map



Legend: Impaired Streams & Lake = Red

Maps 8 through 10 shows close ups, along with selected stream names, of Map 7. Each the following three maps represent a section of Snyder County. Impaired streams (and lake) are red for the next three maps.

Map 8: Western Snyder County Impaired Streams Map



Map 9: Northeastern Snyder County Impaired Streams Map

