

RAPID WATERSHED ASSESSMENT - DATA PROFILE

AUGLAIZE WATERSHED

Rapid watershed assessments provide initial estimates of where conservation investments will 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.

This assessment for the Auglaize Watershed was completed by NRCS with input from our conservation partners and other local entities.

“The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual’s income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA’s TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.”

TABLE OF CONTENTS

Introduction.....	1
Physical Information.....	4
Physical Description.....	4
Land Use and Land Cover.....	6
Information and Trends.....	6
A View of the Auglaize Watershed.....	8
Water Resources Information.....	9
Riparian Zone Protected and Unprotected.....	12
Auglaize Watershed Water Quality Assessment.....	15
Drinking Water Source Protection Area.....	18
Soil Resource Information.....	19
Soil Resources.....	19
Land Capability System.....	19
Prime Farmland Classification.....	22
Hydric Soil Distribution.....	23
Soil Loss.....	24
Analysis of Soil Erosion Potential Within the Watershed.....	26
Flood Plain Soils.....	28
Water Management and Flooding in the Auglaize River Watershed.....	29
Auglaize River Flooding from February 7, 2008, Storm.....	30
Air Resources Information.....	32
Wind Erosion.....	32
Plant and Animal Resources.....	33
Livestock Resources Information.....	33
Wildlife and Endangered Species.....	35
Conservation Systems and Practice Application Data.....	37
Watershed Projects and Planning Information.....	41
Summary and Observations of Watershed Resource Concerns.....	43
Next Steps.....	44
Needed Conservation Practices.....	44
Applicable USDA Farm Bill Programs.....	44
References and Citations.....	45

TABLES AND FIGURES

Table 1 -	Counties Located in the Auglaize Watershed	2
Table 2 -	2000 Census Data Summary	2
Table 3 -	Sandusky Watershed Slope	5
Table 4 -	Cropland and Crop Types in the Watershed.	7
Table 5 -	Stream Miles by Order.	12
Table 6 -	Riparian Zone Protected and Unprotected.	12
Table 7 -	Auglaize Watershed Water Quality Assessment Data	16
Table 8 -	Major Water Bodies in the Watershed	17
Table 9 -	Land Capability Subclasses	20
Table 10 -	Average Annual Soil Erosion Rates on Cropland	24
Table 11 -	Estimated 1997 Gross Soil Loss from Cropland by Land Capability Subclass.	25
Table 12 -	Flood Prone Soils Data	28
Table 13 -	Auglaize River Gage Locations and Data Summary	29
Table 14 -	Peak Flow - Auglaize River near Fort Jennings	31
Table 15 -	Peak Flow - Auglaize River near Defiance	31
Table 16 -	Air Resource Concerns Table	32
Table 17 -	Livestock Operations Data.	33
Table 18 -	Estimated Livestock Animal Units, Manure Production, and Nutrient Production.	34
Table 19 -	Habitat Reference Information	36
Table 20 -	Rare or Endangered Species Information	36
Table 21 -	NRCS Conservation Progress Performance Measures	37
Table 22 -	Agricultural Census Data and Economic Information.	40
Table 23 -	Local Watershed Related Organizations Identified in the Watershed	41
Table 24 -	List of Relevant Published Watershed Plans, Studies, Reports	42
Figure 1 -	Watershed Map	1
Figure 2 -	Auglaize Watershed Map	3
Figure 3 -	10-Meter Digital Elevation Model	5
Figure 4 -	Land Use Map	6
Figure 5 -	Broad Land Use 1982 - 1997.	7
Figure 6 -	Average Annual Precipitation	9
Figure 7 -	Water Withdrawal in the Auglaize Watershed	10
Figure 8 -	Stream Orders for the Auglaize Watershed	11
Figure 9 -	Riparian Zone Analysis Map	13
Figure 10 -	Primary Soil Management Concern within 120 feet of Streams	14
Figure 11 -	Drinking Water Source Protection Area	18
Figure 12 -	Land Capability Subclasses	21
Figure 13 -	Prime Farmland	22
Figure 14 -	Hydric Soil.	23
Figure 15 -	1997 Annual Gross Cropland Soil Loss by Land Capability Subclass	24
Figure 16 -	Soil Erosion Potential (R x K x LS)	26
Figure 17-	1997 Cultivated Cropland Soil Erosion Rates as a Multiple of "T" (Acres).	27
Figure 18 -	Flood Prone Soils.	28
Figure 19 -	Soils Subject to Severe Wind Erosion	32
Figure 20 -	Conservation Tillage Trends	38
Figure 21 -	2006 Conservation Tillage Corn, Soybeans, and Wheat	39
Figure 22 -	2006 Conservation Tillage Corn and Beans	39

INTRODUCTION

The Auglaize Watershed is located in Adams (IN), Allen (OH), Allen (IN), Auglaize, Defiance, Hancock, Hardin, Henry, Mercer, Paulding, Putnam, Shelby, and Van Wert Counties in northwest Ohio. The watershed is delineated by the United States Geological Survey as an 8-digit hydrologic unit number 04100007. The 1,069,303-acre (1,671 square miles) watershed of the Auglaize River drains into the Maumee River at the city of Defiance. Over 71 percent of the watershed is cropland and over 85 percent of the watershed has a 2 percent slope or less. The largest city in the watershed is Lima. The total population in the Auglaize Watershed is estimated at 206,846 (2000 census).

FIGURE 1 - WATERSHED MAP

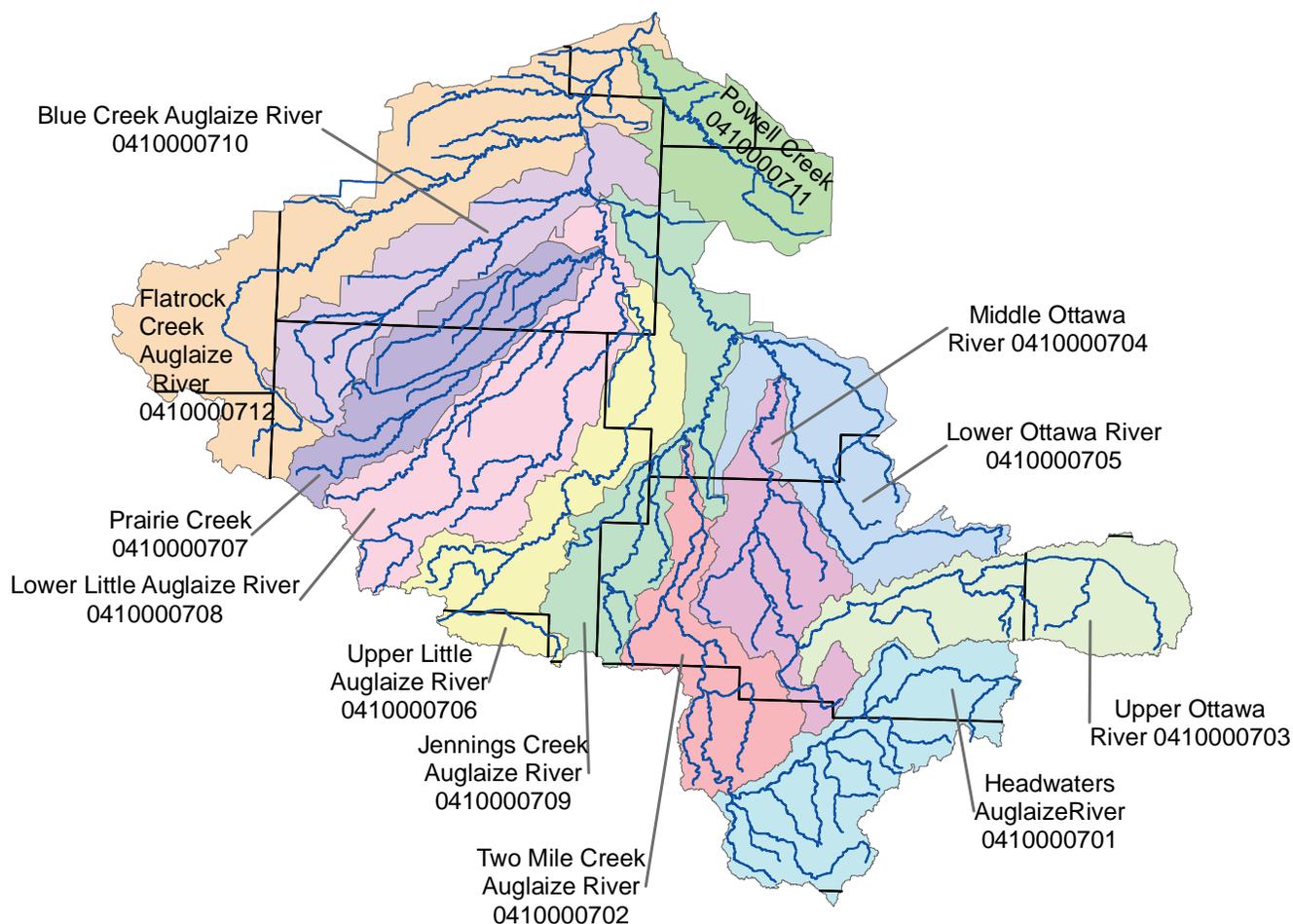


TABLE 1 - COUNTIES LOCATED IN THE AUGLAIZE WATERSHED

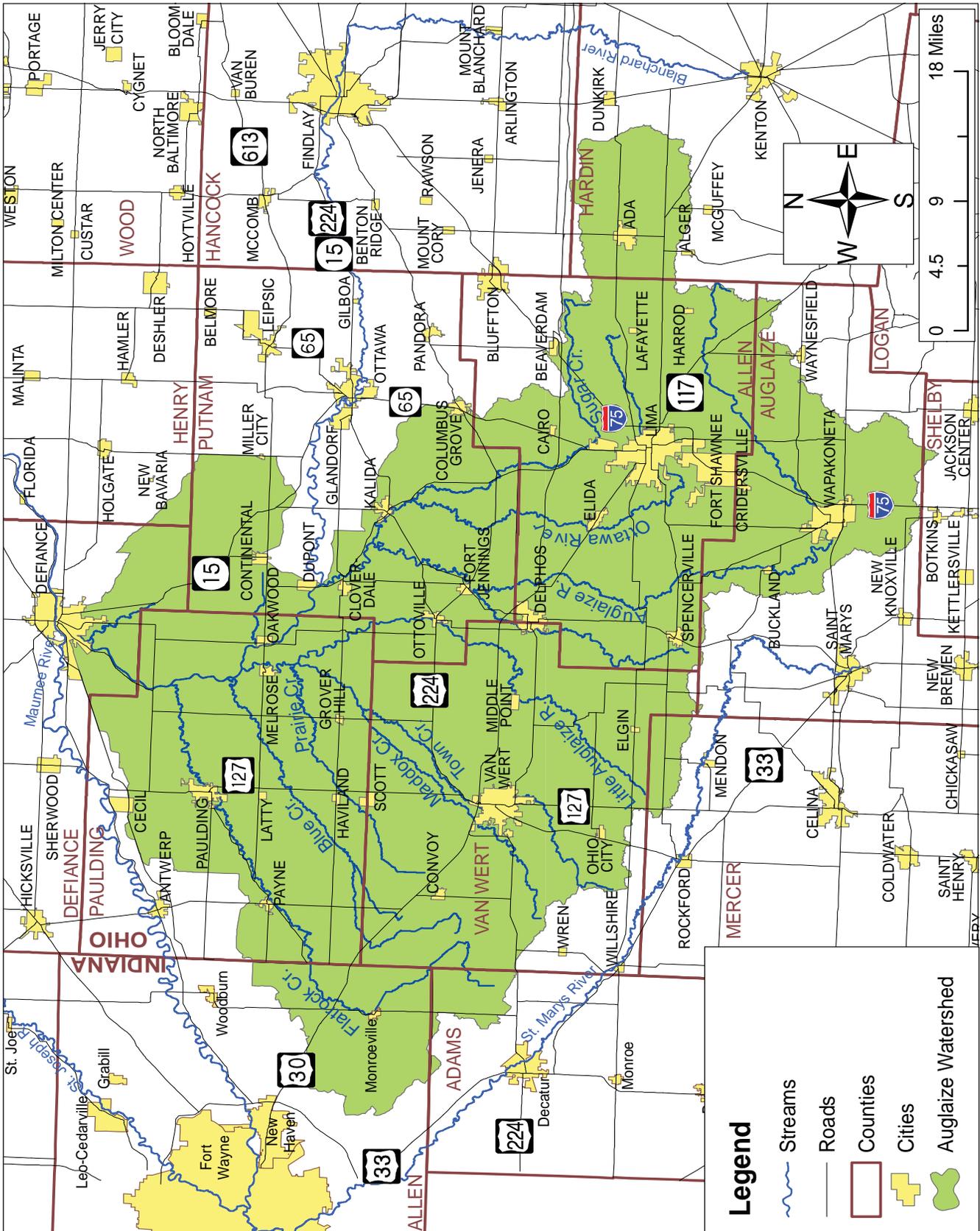
County	Acres	Acres in Watershed	% of Watershed Area	% of County in Watershed
Adams	217,855	11,669	1.1%	5.4%
Allen (IN)	423,033	53,872	5.0%	12.7%
Allen (OH)	260,840	223,159	20.9%	85.6%
Auglaize	257,604	97,217	9.1%	37.7%
Defiance	265,917	33,769	3.2%	12.7%
Hancock	341,639	154	0.0%	0.0%
Hardin	301,761	43,049	4.0%	14.3%
Henry	269,400	3,306	0.3%	1.2%
Mercer	304,264	9,194	0.9%	3.0%
Paulding	269,291	211,963	19.8%	78.7%
Putnam	310,026	148,624	13.9%	47.9%
Shelby	262,903	369	0.0%	0.1%
Van Wert	262,801	232,958	21.8%	88.6%
Totals		1,069,303	100.0%	

**TABLE 2 - 2000 CENSUS DATA SUMMARY
FOR THE AUGLAIZE WATERSHED**

Summary	Number
Total Population	206,846
Total Households	77,966
Total Families	55,294
Total Housing Units	84,019
Average Household Size	2.55
Average Family Size	3.05
Median Household Income	\$39,364
Average Household Income	\$46,992
Per Capita Income	\$17,987
Population by Race	Number
Total	206,846
Population Reporting One Race	204,262
White	187,007
Black or African American	14,031
American Indian or Alaska Native	438
Asian	874
Native Hawaiian or Other Pacific Islander	32
Some Other Race	1,880
Population Reporting Two or More Races	2,584
Total Hispanic Population	4,053

Source: U.S. Census Bureau, Census 2000 Summary File 1 and 3 through ESRI Business Analyst Online, <http://bao.esri.com/esribis>

FIGURE 2 - AUGLAIZE WATERSHED MAP



PHYSICAL INFORMATION

PHYSICAL DESCRIPTION

The Auglaize River Watershed extends across the Major Land Resource Areas (MLRA) 99 and 111. This includes the Erie-Huron Lake Plain of the Lake States Fruit, Truck Crop, and Dairy Region and the Indiana-Ohio Till Plain of the Central Feed Grains and Livestock Region.

The MLRA 99 typically is nearly level glacial lake plain with a few scattered ridges of sandy soils that represent past shorelines and moraines. Local relief typically varies less than 10 feet, except for the beach ridges and low moraines that can rise almost 30 feet above the landscape level. The MLRA 111 is a landscape characterized by a gently undulating glacial Wisconsinan till plain, and most areas are dominated by ground moraines that are broken in places by lake plains, outwash plains, flood plains, and many recessional moraines. The ground moraines and lake plains in front of the recessional moraines are flat to undulating.

The entire land area of the Auglaize Watershed was surveyed using the Public Land Survey System (PLSS), and consequently, cropland, pastureland, and forested areas typically are rectangular in shape. Agriculture typically consists of cash grain farming of corn, soybeans and wheat production, forage (grass-legume hay, tall fescue pasture, and alfalfa hay), and livestock production.

The watershed's bedrock geology consists of Mississippian- to Silurian-age shale, limestone, and dolomite rocks. Surficial materials include glacial deposits of till, glaciolacustrine sediments, and outwash from Wisconsin and older glacial periods.

The following cities and villages are situated entirely or partially in the Auglaize Watershed: Defiance, Cecil, Paulding, Continental, Oakwood, Melrose, Latty, Payne, Dupont, Cloverdale, Grover Hill, Haviland, Scott, Monroeville, Convoy, Ottoville, Kalida, Columbus Grove, Fort Jennings, Middle Point, Van Wert, Ohio City, Delphos, Cairo, Beaverdam, Ada, Lafayette, Lima, Harrod, Wapakoneta, Spencerville, Cridersville, Fort Shawnee, Buckland, Elgin, and Elida.

Prior to historical settlement, the watershed was densely wooded with both upland and lowland forest species. The northern portion of the watershed was formerly a part of the 'The Great Black Swamp' supporting vast wetlands.

**FIGURE 3 - 10-METER DIGITAL ELEVATION MODEL
FOR THE SANDUSKY WATERSHED**

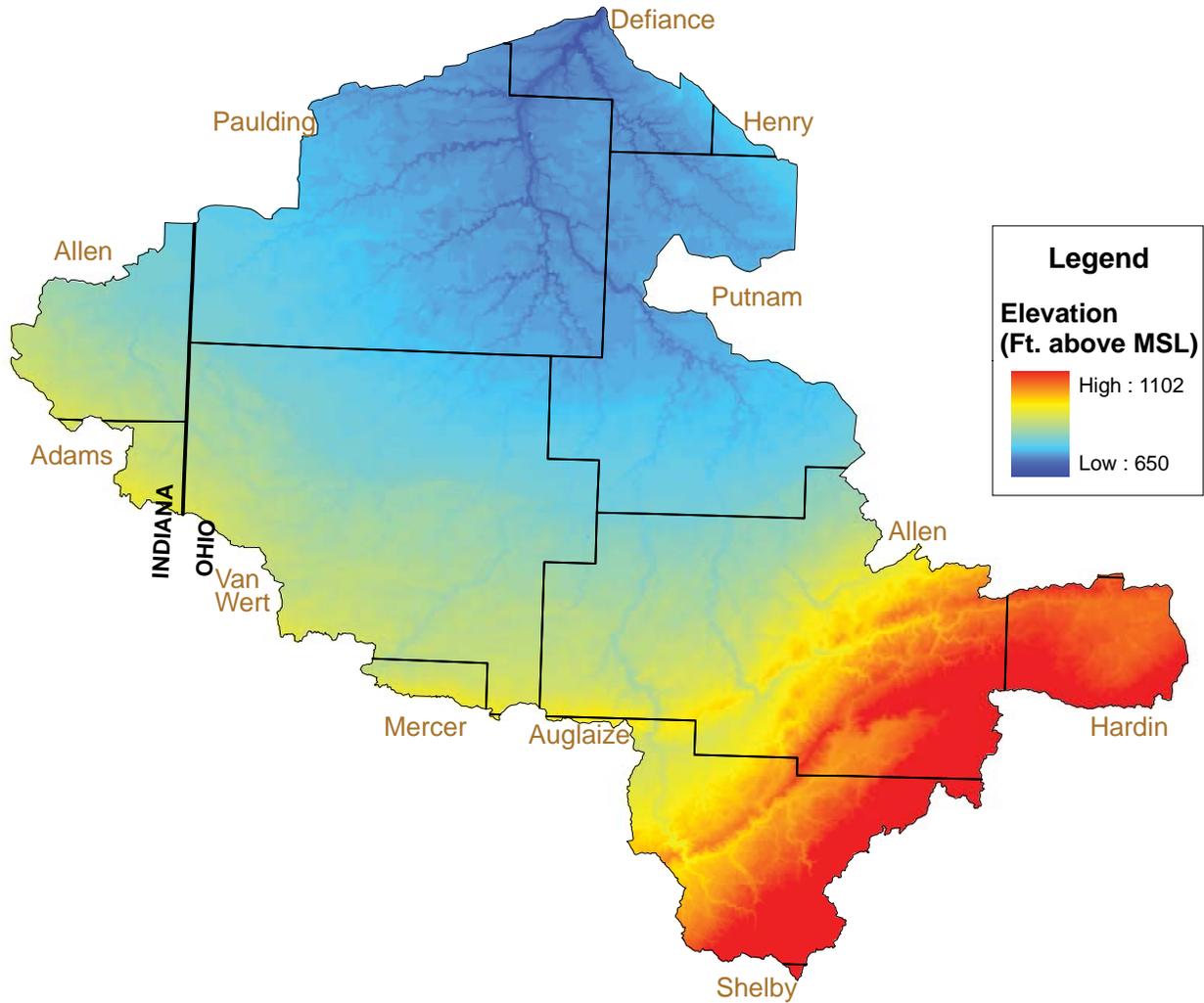


TABLE 3 - SANDUSKY WATERSHED SLOPE

Class	Area (Sq.Mi.)	Percent of Watershed
0-1%	1220.6	73.1
>1-2%	211.1	12.6
>2-4%	146.8	8.8
>4-6%	56.4	3.4
>6-8%	20.7	1.2
>8-10%	8.5	0.5
>10%	6.8	0.4
Total	1670.8	100.0

LAND USE AND LAND COVER

INFORMATION AND TRENDS

According to the USDA-NRCS National Resources Inventory (NRI), from 1982 to 1997, there was an increase of about 20,100 acres of urban/built-up land, representing about 1.9 percent of the Auglaize River Watershed with a slight corresponding decline in pastureland and cropland acreage. Forestland also increased during the same period, from 75,900 to 83,300 acres.

In 1997, according to the NRI, the watershed was 77 percent cropland, 1.5 percent pastureland, 7.9 percent forestland, 2.8 percent minor cover/uses, 1.6 percent rural transportation, 1 percent water, 1.4 percent Conservation Reserve Program (CRP), and about 6.8 percent urban/built-up land.

In 2006, from National Agricultural Statistics Service data as shown below, there were about: a) 764,630 acres of cropland; b) 82,500 acres of woodland; and c) 141,390 acres of urban land.

FIGURE 4 - LAND USE MAP

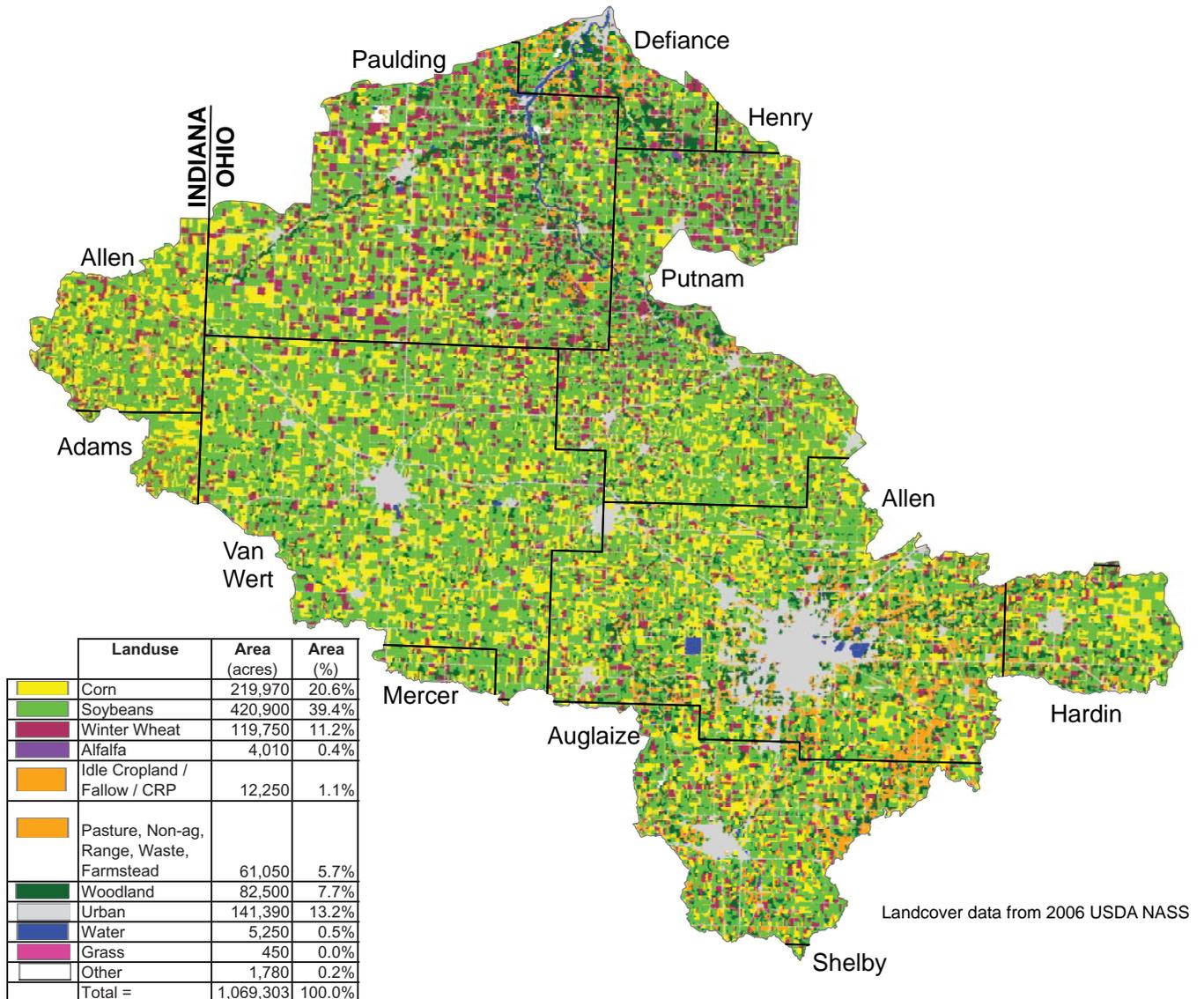
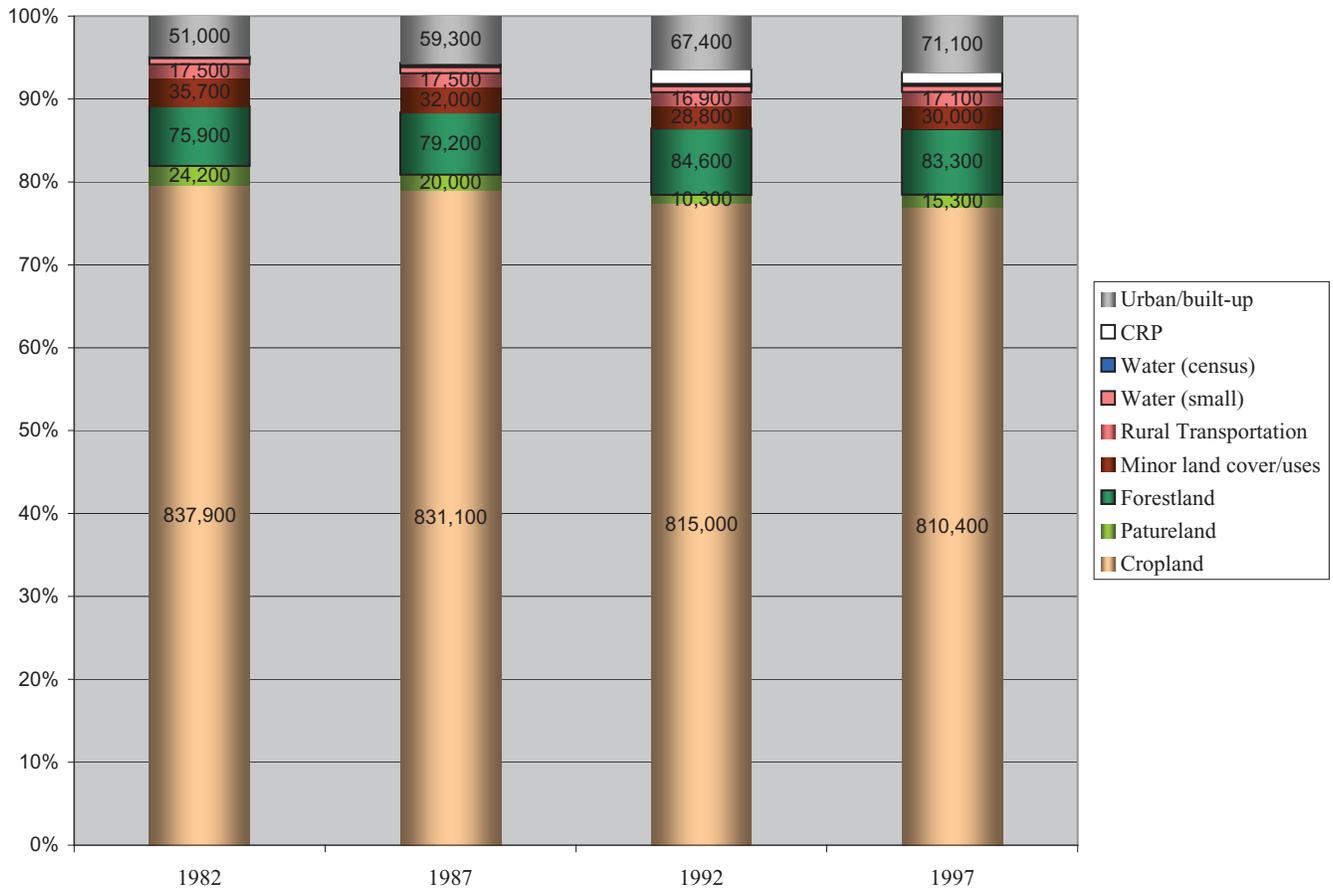


TABLE 4 - CROPLAND AND CROP TYPES IN THE WATERSHED

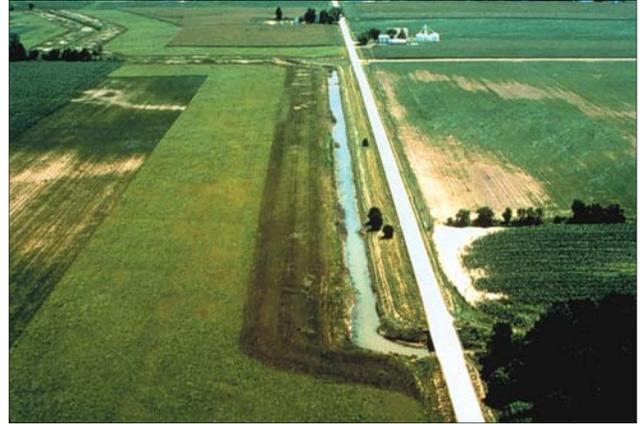
	Cropland	Corn	Bean	Wheat	Alfalfa
Watershed (Ac.)	764,630	219,970	420,900	119,750	4,010
% of Cropland		28.8%	55.0%	15.7%	0.5%

Source: 2006 Landuse / Landcover from NASS

**FIGURE 5 - BROAD LAND USE
1982 - 1997**



A VIEW OF THE AUGLAIZE WATERSHED



WATER RESOURCES INFORMATION

FIGURE 6 - AVERAGE ANNUAL PRECIPITATION

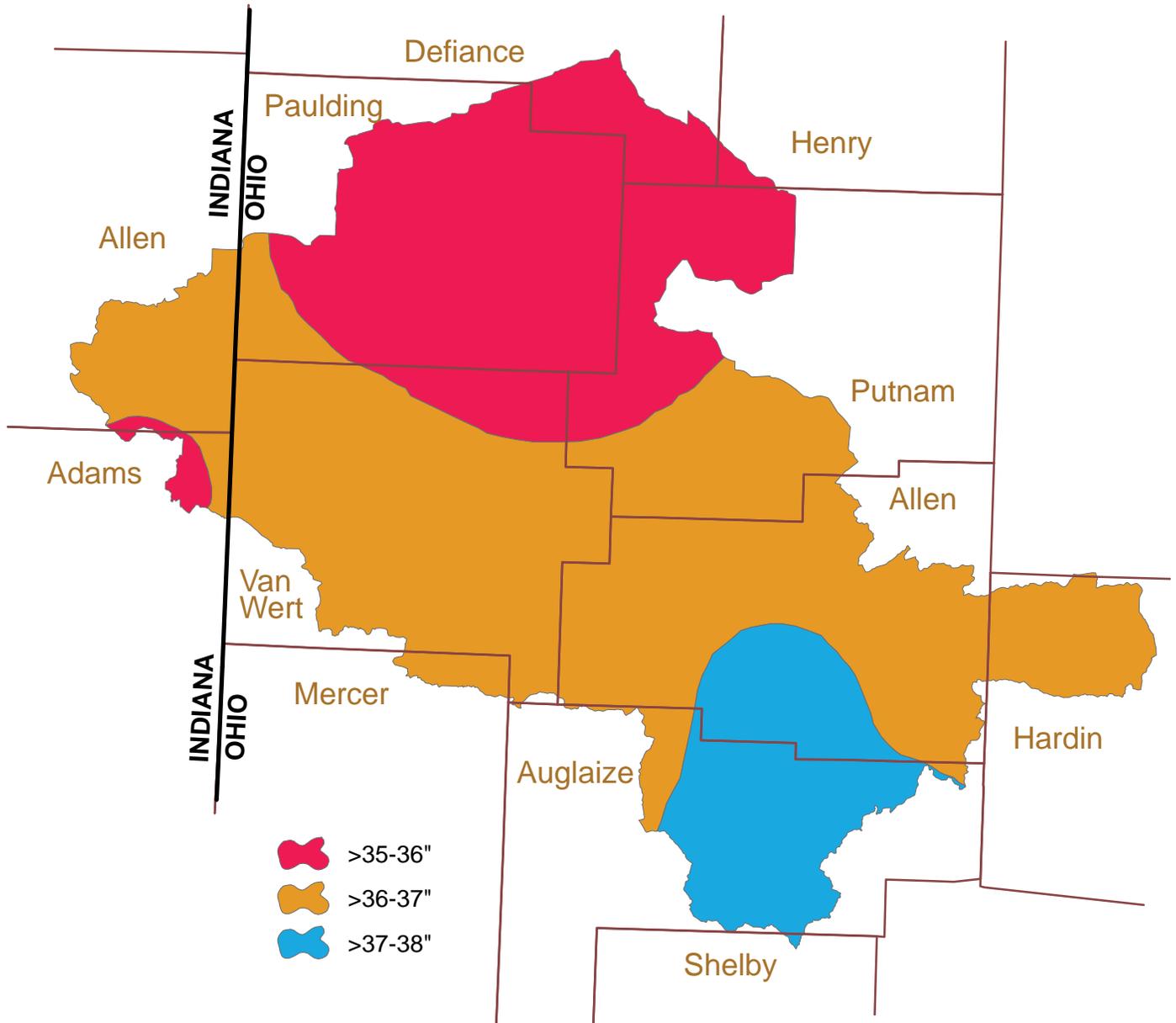
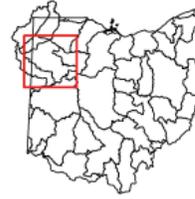
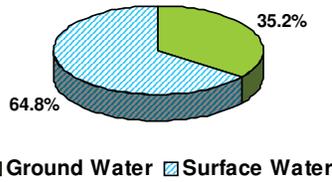


FIGURE 7 - WATER WITHDRAWAL IN THE AUGLAIZE WATERSHED

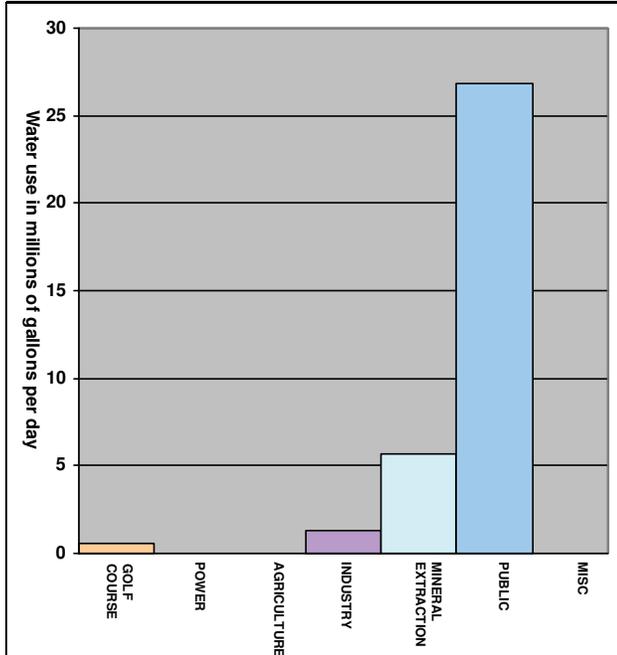
Water Withdrawal in the Auglaize Basin

Total fresh-water withdrawal and source of water in 2005

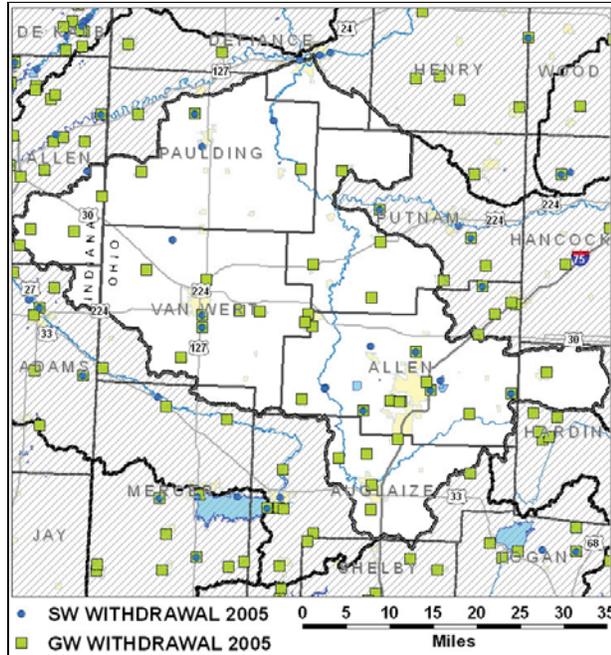
Source	Water use, in million gallons per day	Percent of total use
Surface Water	22.32	64.8%
Ground Water	12.12	35.2%
Total	34.44	100.0%



Total fresh-water withdrawal by category in 2005



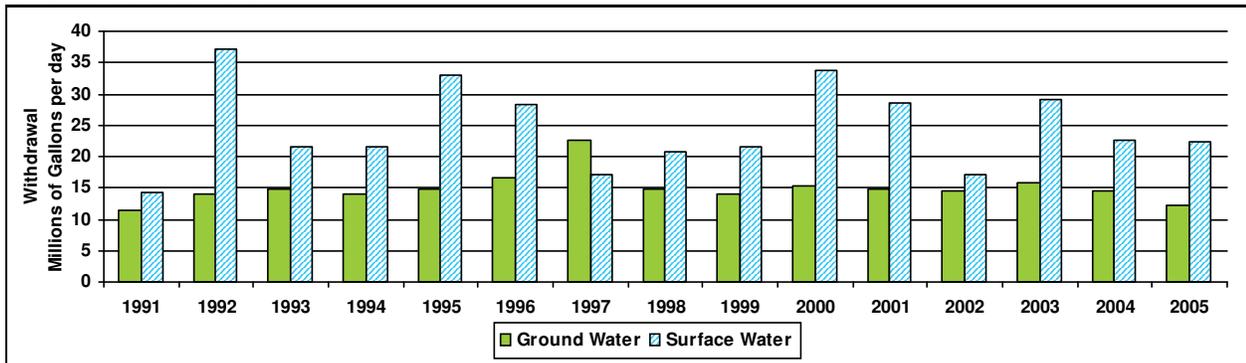
Location of facilities withdrawing water in 2005



Total fresh-water withdrawal by category in 2005 in millions of gallons per day

	Golf Course	Power	Agriculture	Industry	Mineral Extraction	Public	Misc	Total
Surface Water	0.25	0.00	0.00	0.20	0.00	21.88	0.00	22.32
Ground Water	0.28	0.00	0.00	1.14	5.71	4.98	0.00	12.12
Total	0.54	0.00	0.00	1.33	5.71	26.86	0.00	34.44
Percent Total	1.6%	0.0%	0.0%	3.9%	16.6%	78.0%	0.0%	100.0%

Water withdrawal trends



Provided by Ohio Department of Natural Resources (<http://www.dnr.state.oh.us/tabid/4035/Default.aspx>) in cooperation with U.S. Geological Survey (<http://oh.water.usgs.gov/>) and Natural Resources Conservation Service (www.oh.nrcs.usda.gov/). Indiana data provided by Indiana DNR (http://www.in.gov/dnr/water/water_availability/SWWF/index.html). See (www.dnr.state.oh.us/tabid/18805/Default.aspx) for explanation of data.

FIGURE 8 - STREAM ORDERS FOR THE AUGLAIZE WATERSHED

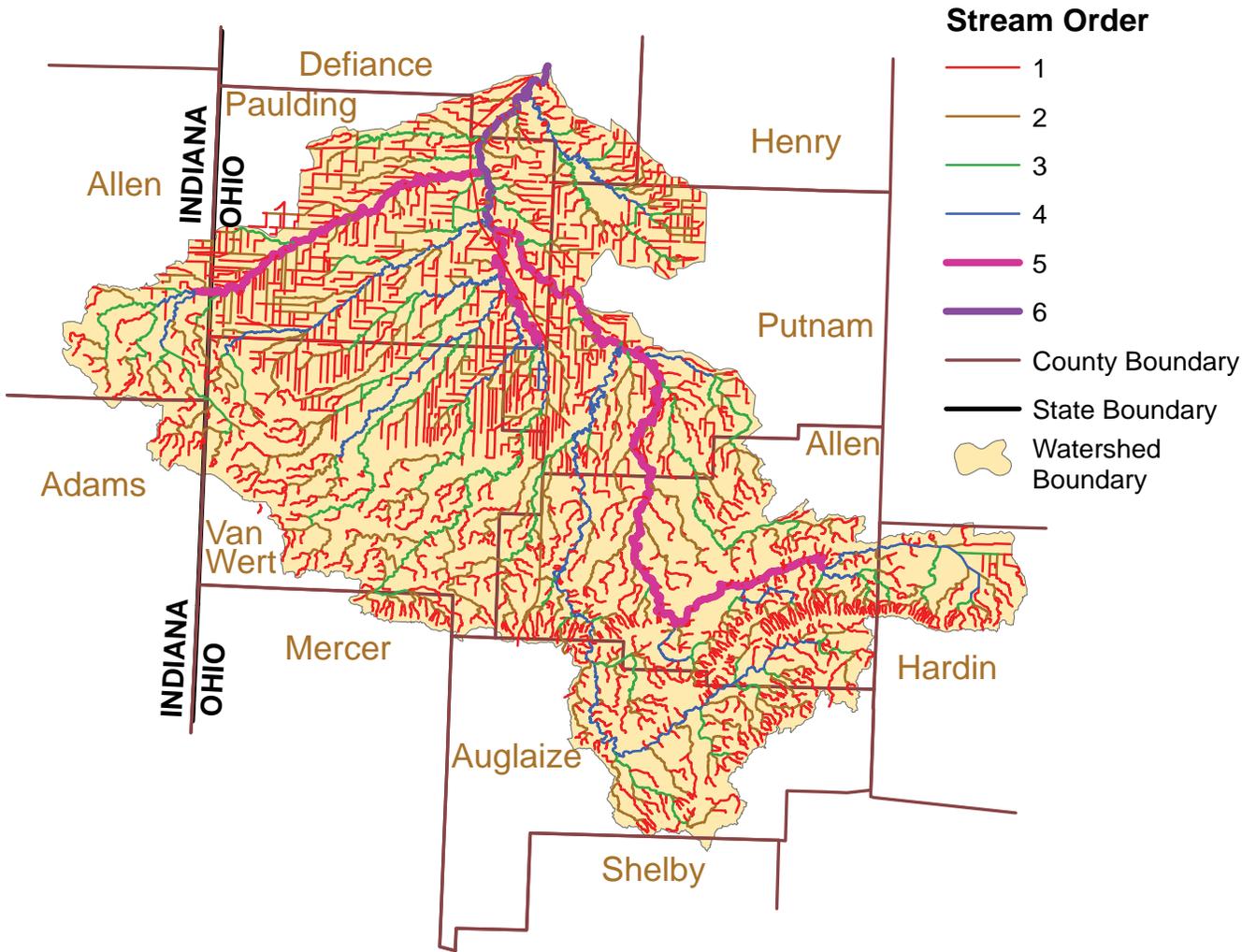


TABLE 5 - STREAM MILES BY ORDER

	Acres of Standing Water (Lakes/Ponds)	Total Miles of Streams	Total Miles 1st Order Streams	Total Miles 2nd Order Streams	Total Miles 3rd Order Streams	Total Miles 4th Order Streams	Total Miles 5th Order Streams	Total Miles 6th Order Streams
Auglaize Watershed	3459.0 ¹	3224.8	1782.6	698.9	362.9	240.3	121.9	18.2
Adams Co., IN, in WS ²	5.4	24.7	19.5	5.2	N/A	N/A	N/A	N/A
Allen Co., IN, in WS	38.1	128.7	58.1	30.5	27.7	10.9	1.6	N/A
Allen Co., OH in WS	1920.5	655.1	360.7	152.1	56.3	52.9	33.1	N/A
Auglaize Co., in WS	335.8	267.9	152.5	66.1	22.6	26.8	N/A	N/A
Defiance Co., in WS	165.4	114.7	61.5	15.4	11.6	16.5	0.0	9.7
Hardin Co., in WS	27.8	114.9	68.6	23.4	12.7	10.3	N/A	N/A
Henry Co., in WS	0.3	15.2	11.9	3.3	N/A	N/A	N/A	N/A
Mercer Co., in WS	2.6	31.0	21.7	7.6	1.7	N/A	N/A	N/A
Paulding Co., in WS	455.2	730.5	388.8	146.2	75.1	54.5	57.2	8.5
Putnam Co., in WS	110.6	519.1	282.5	103.8	56.3	46.5	29.9	N/A
Van Wert Co., in WS	397.3	623.2	356.9	145.3	99.0	21.9	N/A	N/A

¹ 0.05 Acres and larger.

² WS = Watershed

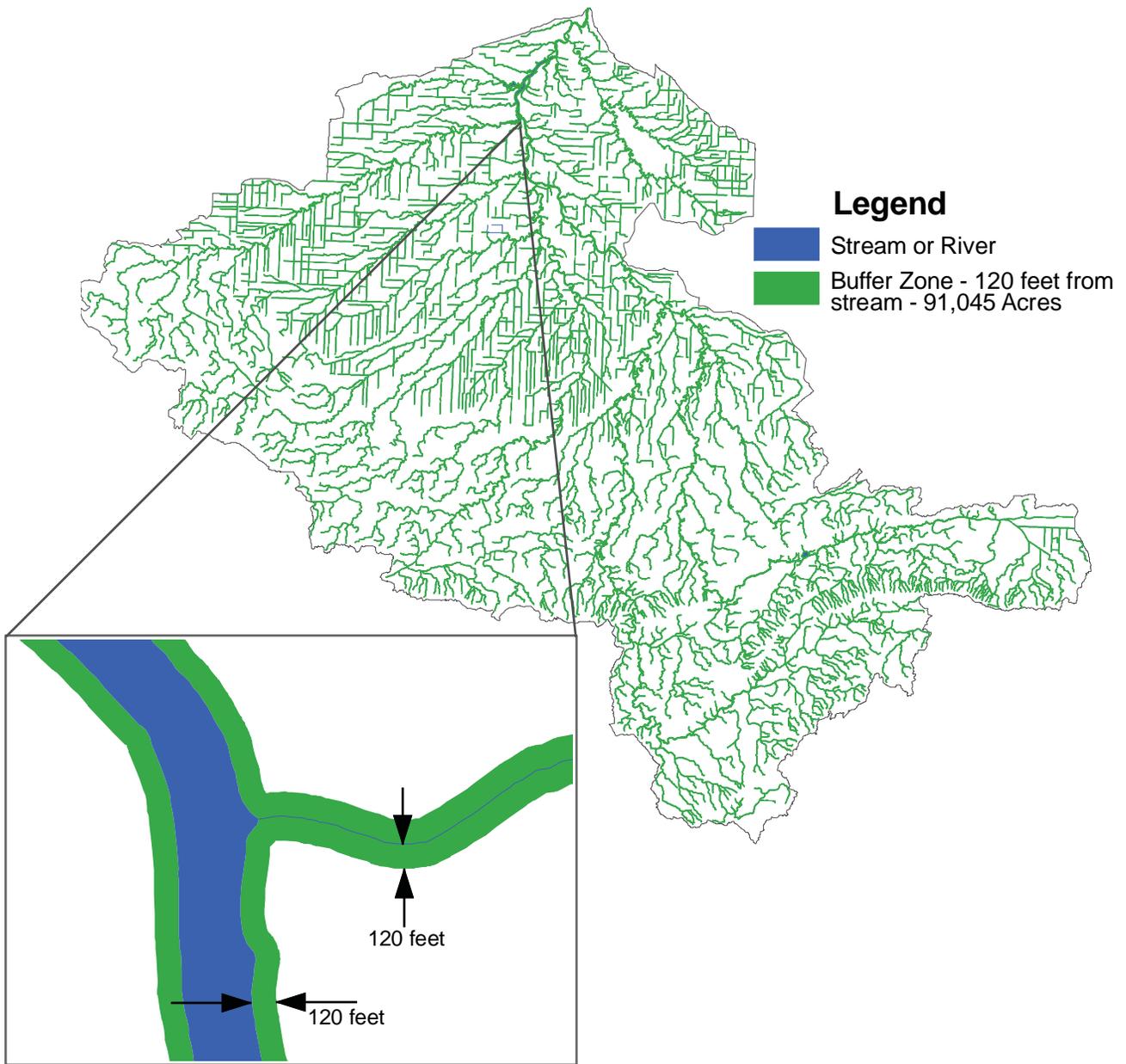
RIPARIAN ZONE PROTECTED AND UNPROTECTED

Available Common Land Unit (CLU) data was used to get an estimate of the amount of cropland riparian area that is protected by Conservation Reserve Program (CRP) buffer practices. Additionally, the total amount of protected riparian area was estimated by adding naturally protective land uses (e.g., woods, wetlands, farmsteads, and urban) from the National Agricultural Statistics Service 2006 land use layer to cropland from the CLU layer that was protected by CRP practices. (Note: This buffer is half as wide as the buffer used for soil management concern on the next page.)

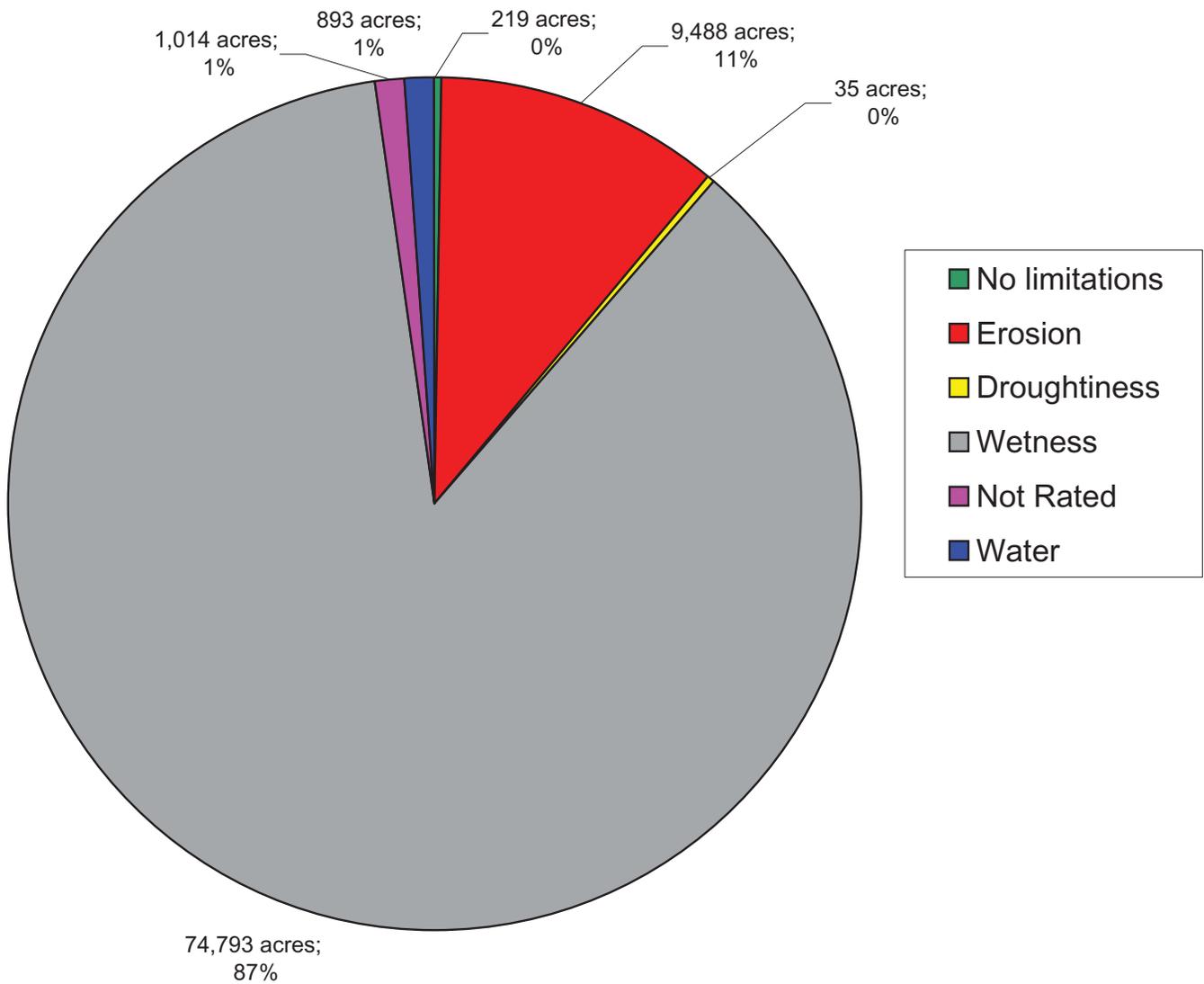
TABLE 6 - RIPARIAN ZONE PROTECTED AND UNPROTECTED

Acres Within 60 Feet of Stream Buffer on Both Sides (120 ft. total)	
% Total Cropland Acres in Riparian Zone Protected By CRP	12.0%
% Total Cropland Acres In Riparian Zone Unprotected	88.0 %
% of Total Acres In Riparian Zone That Are Protected	58.2 %
% of Total Acres in Riparian Zone That Need Protection	41.8 %

FIGURE 9 - RIPARIAN ZONE ANALYSIS MAP



**FIGURE 10 - PRIMARY SOIL MANAGEMENT CONCERN WITHIN 120 FEET OF STREAMS
(ACRES AND PERCENTAGE)**



AUGLAIZE WATERSHED WATER QUALITY ASSESSMENT

The Upper Auglaize River Total Maximum Daily Load (TMDL) final report was published August 16, 2004. TMDLs identify and evaluate water quality problems in impaired water bodies and propose solutions to bring those waters into attainment of their designated use. The following is taken from this report. A TMDL does not exist for the whole of the Auglaize River Watershed, but the Upper Auglaize TMDL should be representative of the whole at least in large outline. The Upper Auglaize Watershed for this analysis consists of the Auglaize River watershed upstream of the confluence with the Little Auglaize River, but not including the Blanchard or Ottawa River tributaries.

The Upper Auglaize TMDL report addresses water quality problems that were identified on the 1998, 2002, and 2004 Section 303(d) lists. These lists, using the 11-digit Hydrologic Unit as a basis for assessment, found all three watershed assessment units, namely 04100007 010, 04100007 020, and 04100007 060, impaired for their aquatic life uses and recreational uses. A large river assessment unit is partly contained in the Upper Auglaize TMDL area and this part “is meeting its designated aquatic life uses and attaining water quality standards.” (Page V) The most extensive investigation of the chemical (water column, sediment), physical (flows, habitat), and biological (fish and aquatic insect) conditions in stream water quality in the watershed was conducted by Ohio EPA in 2000.

In the watershed assessment units, the water quality impairment was found to be primarily caused by:

- Habitat degradation (including flow alteration and sedimentation).

- Organic enrichment.

- Excessive nutrients.

- Elevated bacteria levels.

A TDML was calculated for habitat (flow and sedimentation), dissolved oxygen (DO), total phosphorus, ammonia, and bacteria.

The TMDL report summarizes trends in the watershed as follows: “changes in agricultural practices, such as conservation tillage and participation in conservation reserve programs, are already having a positive impact on water quality in the Upper Auglaize River mainstem compared to survey results from 1991.” (Page V) It goes on to explain: “...the primary causes of impairment in each assessment unit (HUC 11) have already been reduced to several isolated and segment-specific problems in some of the tributaries and smaller subwatersheds within each HUC11. In this case, it made more sense to develop TMDLs for each impaired segment or small drainage area than for each entire assessment unit (HUC 11).” (Page 2)

Table 7 displays watershed assessment scores, impairments by assessment unit, and corresponding NRCS Field Office Technical Guide conservation practices which will have a beneficial effect on these impairments.

TABLE 7 - AUGLAIZE WATERSHED WATER QUALITY ASSESSMENT DATA
 (DATA FROM OHIO EPA TMDL REPORT – AUGUST 2004)(SOURCE OF DATA OHIO EPA UPPER AUGLAIZE RIVER WATERSHED TMDL REPORT)

Unit	Attainment Status		Conservation Practices Benefiting Impairments If Applied to Watershed					
	Watershed Score*	Causes of Impairment	Conservation Tillage	Conservation Buffers +	Nutrient Management	Animal Waste Utilization	Cons Cover/Tree Planting ++	Drainage Water Mgt
Auglaize River Headwaters including Pusheta Cr. 010			94	Ammonia		***	***	***
	Bacteria			***	***	***	***	***
	Flow alteration	***		***			***	***
	Habitat alteration			***			***	***
	Nutrients	***		***	***	***	***	***
	Organic enrich/DO	***		***	***	***	***	***
	Siltation	***		***			***	
Auglaize R. & tribs. from Pusheta to Jennings Creeks 020	57	Bacteria		***	***	***	***	***
		Flow alteration	***	***			***	***
		Habitat alteration		***			***	***
		Nutrients	***	***	***	***	***	***
		Organic enrich/DO	***	***	***	***	***	***
		Siltation	***	***			***	
Augl. R. tribs dnstr. & incl. Jennings Cr. to L. Augl. R. & Augl. R. @ Jennings Cr. to Ottawa R. 060	81	Ammonia		***	***	***	***	***
		Bacteria		***	***	***	***	***
		Flow alteration	***	***			***	***
		Habitat alteration		***			***	***
		Nutrients	***	***	***	***	***	***
		Organic enrich/DO	***	***	***	***	***	***
		Siltation	***	***			***	
Severe Basinwide Impairment (Scores 0-39)	Impairment Justifying Basinwide Effort (Scores 40-79)		Score Indicative of Localized Water Quality Issues (Scores 80-90)					

*** Denotes a conservation practice which will have a positive effect on the impairment identified.

+ Note: Conservation Buffers = Filter strips, Riparian Forest Plantings, Wetland Restoration, Field Windbreaks

++ Note: Conservation Cover = Cover Crops, CRP Plantings, Riparian Tree Plantings, Windbreaks

* Watershed assessment unit score is average grade of aquatic life use status. A max assessment unit score of 100 is possible if all monitored sites meet designated aquatic life uses. The method of calculation is presented in Ohio EPA 2002 Integrated Water Quality Monitoring and Assessment Report.

This table prepared from Ohio EPA Sandusky Watershed TMDL Data of August 2004 and NRCS Field Office Technical Guide Conservation Effects.

TABLE 8 - MAJOR WATER BODIES IN THE WATERSHED

Name/Location	Acres	Elev(ft.)	Type	Uses
Bresler (Spencerville) Reservoir	582	850.5	Upground	Municipal supply, recreation
Ferguson Reservoir (Lima)	307	920.0	Upground	Municipal supply, recreation
Metzger Reservoir (Lima)	154	914.0	Upground	Municipal supply, recreation
Lost Creek Reservoir (Lima)	127	892.0	Upground	Municipal supply, recreation
Gravel Pits southeast of Wapakoneta	93		Dugouts	
Lima Reservoir (Lima)	84	877.0	Upground	Municipal supply, recreation
Middle Point Quarry	80		Dugout	Recreation
Paulding Upground Reservoir	66	719.0	Upground	Municipal supply, recreation
Van Wert Reservoir Number One	60	802.0	Upground	Municipal supply, recreation
Van Wert Reservoir Number Two	60		Upground	Municipal supply, recreation
Camp Lakota Boy Scout Lake	41	669.0	Impoundment	Recreation
Gravel Pits just northeast of Wapakoneta	38		Dugout	
Kohart Lake	24		Dam on Stream	Recreation
Twin Lake Reservoir (Lima)	22		Upground	Municipal supply, recreation
Schoonover Lake (Lima)	22	852.0	Dugout	Municipal supply, recreation

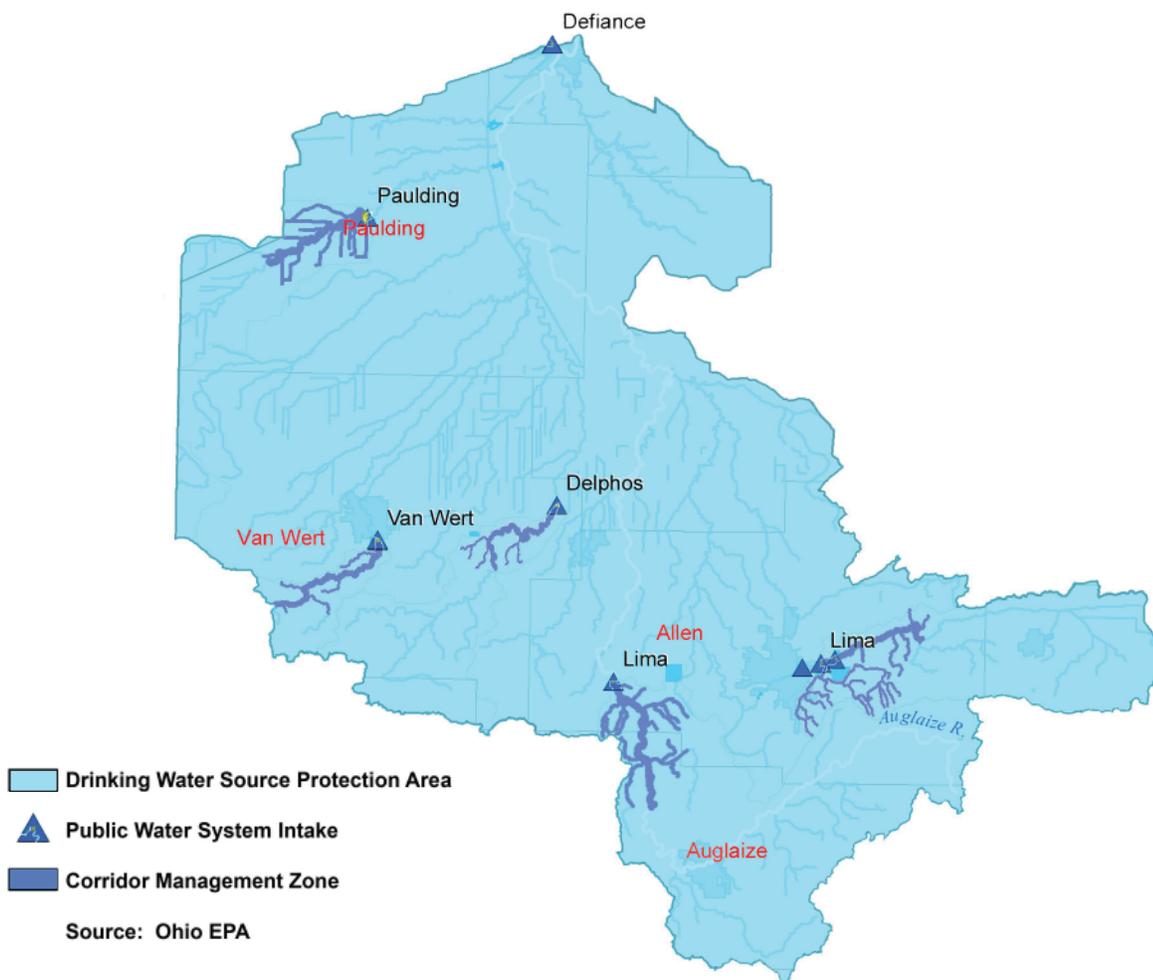
DRINKING WATER SOURCE PROTECTION AREA

The Source Water Assessment and Protection Program in Ohio helps public water suppliers protect drinking water sources, such as streams and underground aquifers, from contamination, in keeping with the Federal Safe Drinking Water Act amendments of 1986 and 1996. These efforts consist of both an assessment (including protection area delineation; identifying the potential contaminant sources in that area; and determining the susceptibility of the aquifer or surface water) and a plan for protection. Possible threats to the surface water source include agricultural runoff (pesticide/fertilizer storage and application, animal feedlots), transportation spills, home construction runoff, oil/gas production activities, unsewered areas, wastewater treatment discharges, landfills, and commercial sources.

The map below shows Drinking Water Source Assessment Areas for Public Water Systems using surface water in the Auglaize River subbasin. The areas shaded in dark blue are stream corridor management zones which are typically upstream from points of water intake.

Conservation management practices such as nutrient management, pest management, conservation buffers and filters, conservation tillage, and animal waste utilization can have a beneficial effect on water quality in the designated source water protection areas.

FIGURE 11 - DRINKING WATER SOURCE PROTECTION AREA



SOIL RESOURCE INFORMATION

SOIL RESOURCES

The soils of the Auglaize Watershed formed in many different kinds of parent materials including glacial till, lacustrine and beach deposits, glacial outwash, recent alluvium, material weathered from bedrock, and organic soil material.

There are 309 different soil types occurring in the watershed, each with its separate soil management concerns, crop productivity and capability for different land uses. The soils are dominantly nearly level, very poorly and poorly drained soils that occupy about 60 percent of the watershed and nearly level and gently sloping somewhat poorly drained soils occupy about 31 percent of the watershed. Sloping to steep areas of moderately well and well drained soils on short dissected side slopes, knolls and narrow beach ridges occupy about 3 percent of the watershed.

Nearly level and gently sloping areas of fine textured somewhat poorly drained Blount soils comprise about 20 percent of the watershed. Expansive areas of nearly level very poorly drained fine textured Hoytville, Paulding, and Latty soils comprise about 16, 11, and 8 percent of the watershed, respectively. These soils need artificial drainage for grain crop production due to wetness limitations.

Soil management concerns for most of the soils of the Auglaize Watershed include: a) high clay content, seasonal wetness, and the need for artificial drainage on about 778,000 acres of land; b) a hazard of soil erosion by water on about 195,500 acres of land; c) a hazard of soil erosion by wind on about 6,900 acres; d) a hazard of droughtiness due to a restricted root zone on about 1,600 acres; and e) and a hazard of soil subsidence on about 880 acres of organic soils.

LAND CAPABILITY SYSTEM

Land capability classification shows, in a general way, the suitability and management concerns of soils for most kinds of field crops. In general, the soils here are grouped at two levels, capability class and subclass. Capability classes, the broadest groups, are designated by numbers 1 through 8 indicating progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1: soils having few limitations for use; Class 2: soils having moderate limitations;
Class 3: soils having severe limitations; Class 4: soils having very severe limitations;
Class 5: soils having severe limitations for use other than a hazard of erosion; and Class 6 and 7:
soils having very severe limitations making them generally unsuitable for cultivation.

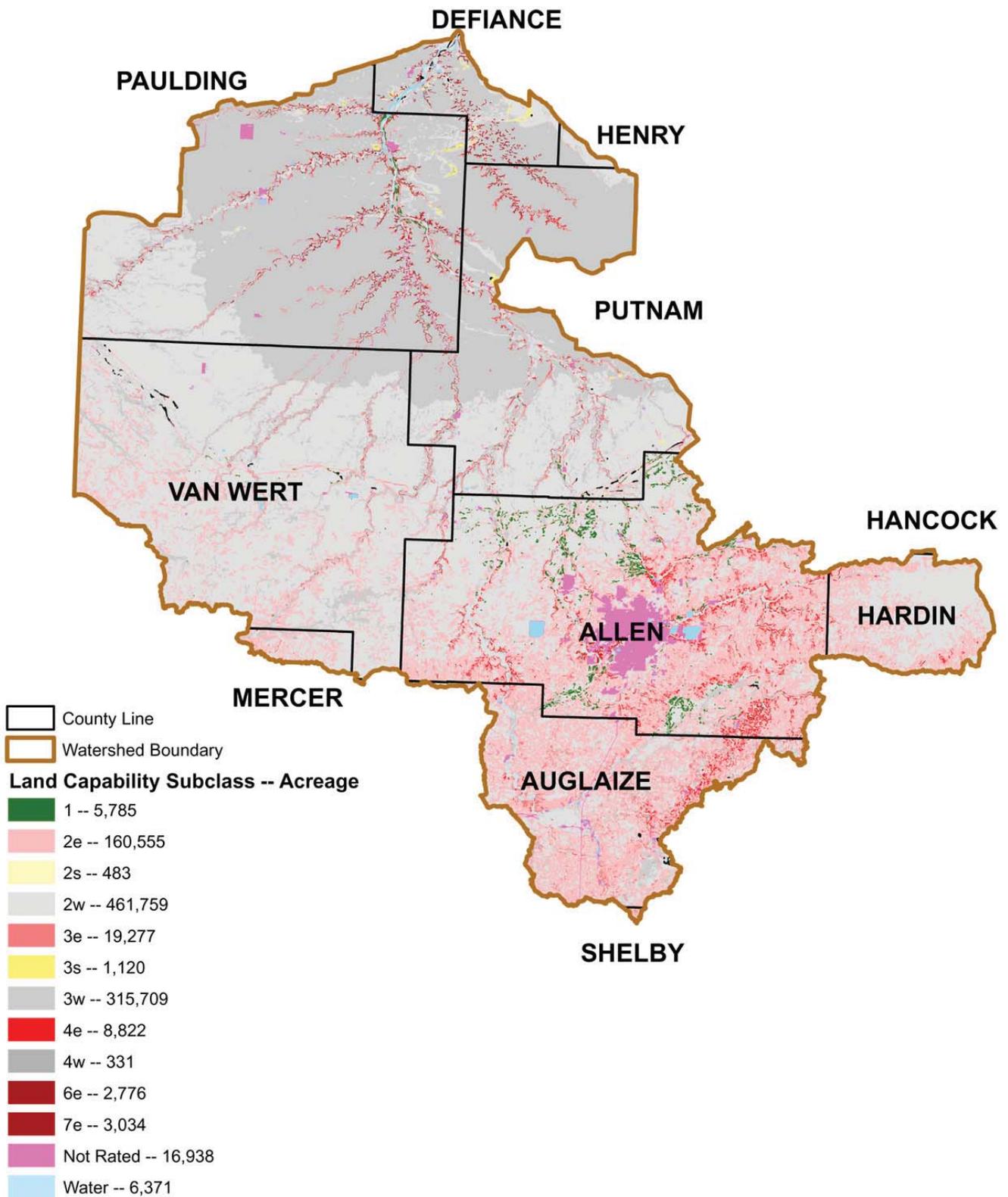
Capability subclasses are soil groups within one class and are designated by adding a lower case letter e, w, or s to the class number denoting a hazard of erosion, wetness, or a restricted root zone, respectively.

In general, there are about 5,800 acres of Class 1 soils (having no significant limitations); 623,000 acres of Class 2 soils; 336,000 acres of Class 3 soils; 9,100 acres of Class 4 soils; 2,800 acres of Class 6 soils; and 3,000 acres of Class 7 soils.

TABLE 9 - LAND CAPABILITY SUBCLASSES

Land Capability Subclass	Acres	Percent of Watershed
1	5,785	0.6%
2e	160,555	16.0%
2s	483	0.0%
2w	461,759	46.0%
3e	19,277	1.9%
3s	1,120	0.1%
3w	315,709	31.5%
4e	8,822	0.9%
4w	331	0.0%
6e	2,776	0.3%
7e	3,034	0.3%
Not Rated	16,938	1.7%
Water	6,371	0.6%

FIGURE 12 - LAND CAPABILITY SUBCLASSES

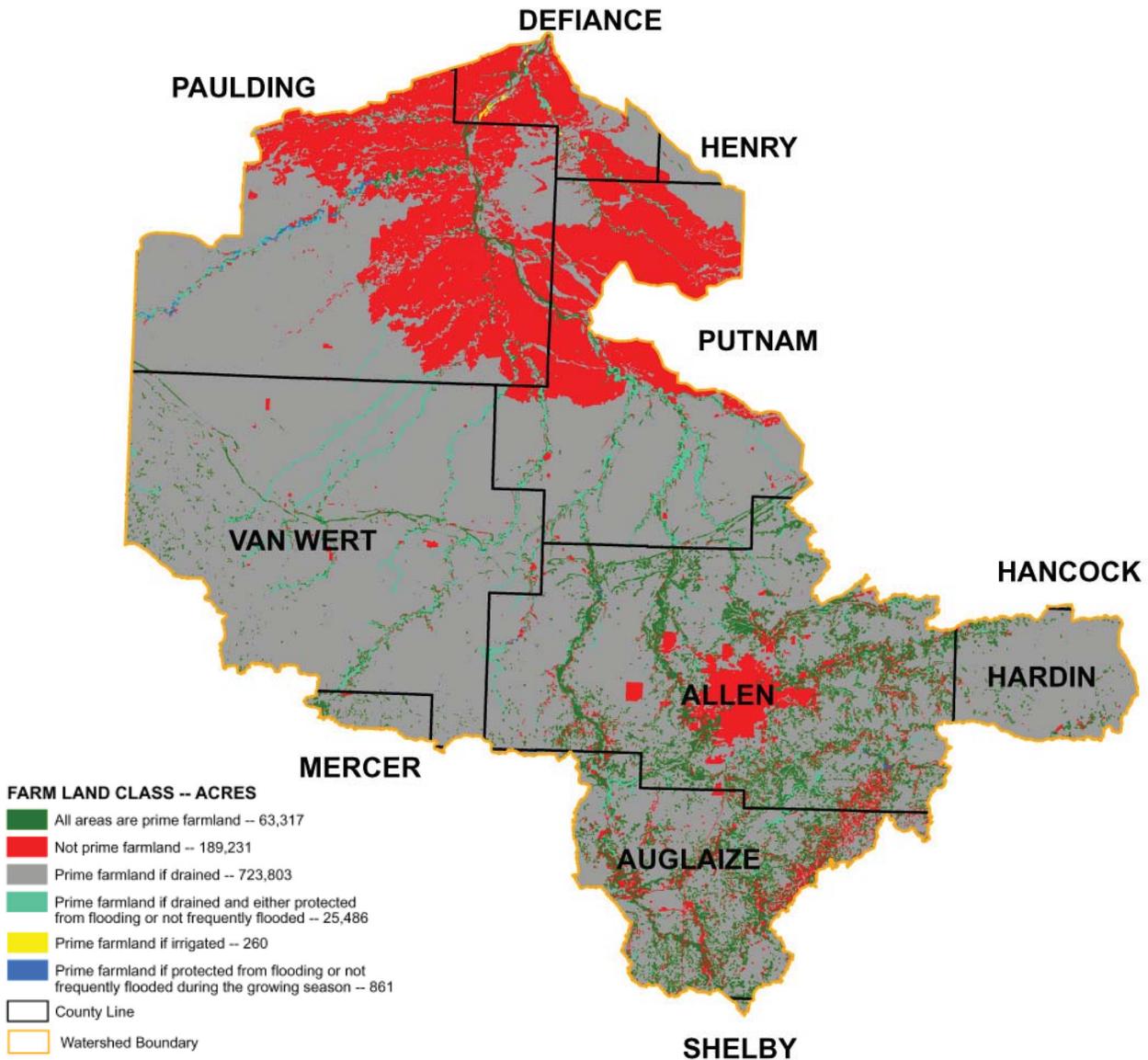


PRIME FARMLAND CLASSIFICATION

Prime farmland is one of several kinds of important farmland defined by the USDA. In the watershed, about 723,800 acres are listed as “prime farmland if drained,” including areas of Blount, Hoytville, Pe-wamo, Latty, Nappanee, Toledo, Haskins, and Montgomery soils; 63,300 acres are listed as “all areas are prime farmland,” including nearly level and gently sloping areas of Glynwood, Houcktown, Knoxdale, Eldean, Genesee, Cygnet, and Morley soils; 25,400 acres listed as “prime if drained and protected from flooding or not frequently flooded during the growing season,” including areas of Wabasha, Sloan, Shoals, and Defiance soils; and about 300 acres are listed as prime farmland if irrigated, primarily areas of Del Rey Variant soils in Defiance County.

In the Auglaize Watershed, about 189,000 acres are listed “not prime farmland,” including areas of nearly level Paulding and Roselms soils, urban land, udorthents, water, and sloping and steep areas of Morley, Broughton, Glynwood, and St. Clair soils.

FIGURE 13 - PRIME FARMLAND



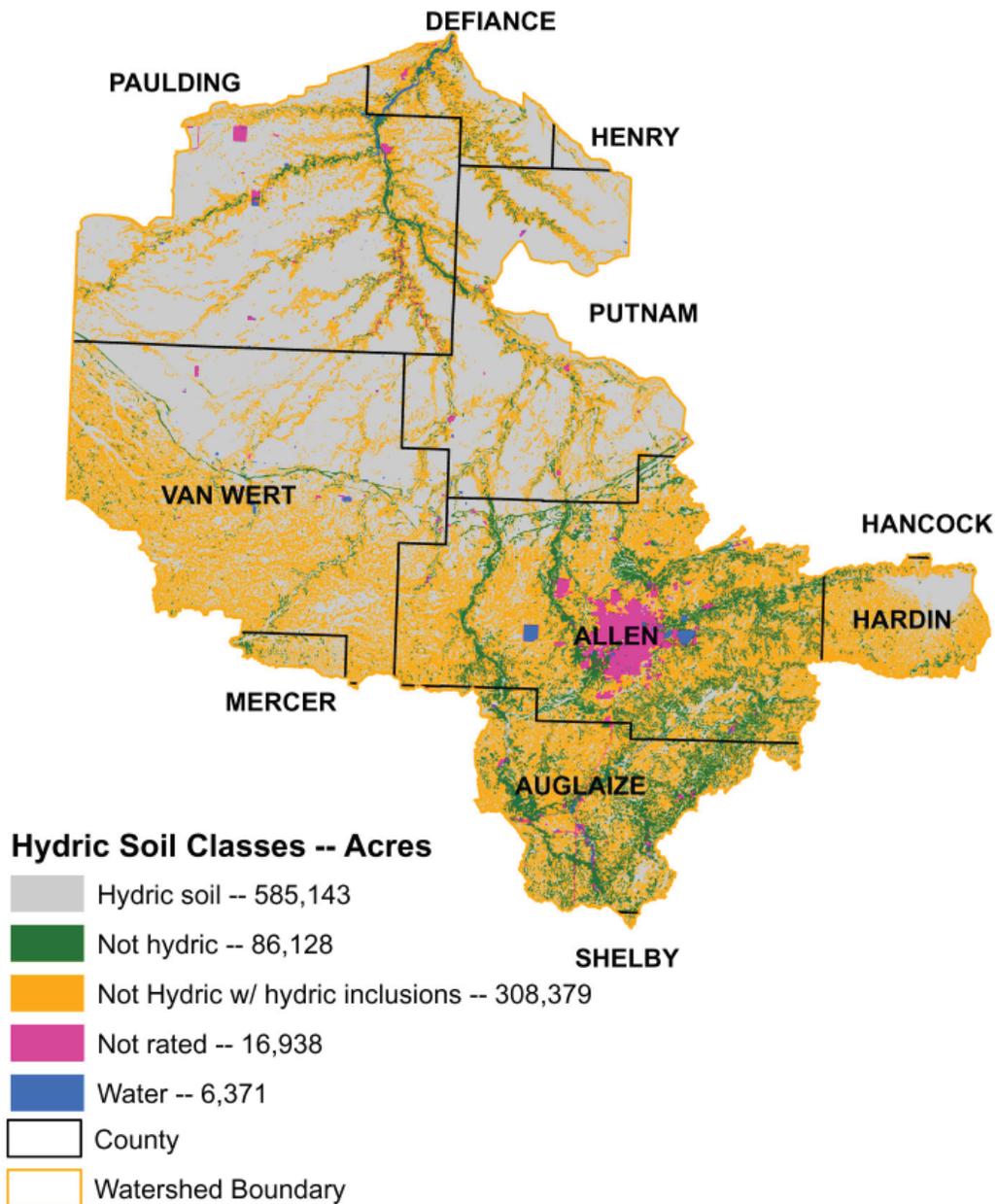
HYDRIC SOIL DISTRIBUTION

Hydric soils are those soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil and support the growth and regeneration of hydrophytic, or water-loving, vegetation.

In the Auglaize Watershed, hydric soils occur on expansive flats and depressional areas and comprise about 58 percent of the watershed.

Of the 309 different soil types occurring in the watershed, 74 soil types are hydric soils occupying about 585,000 acres of the watershed. Hoytville, Paulding, and Latty soils are the most extensive hydric soils and occupy 164,000 acres, 112,000 acres, and 81,000 acres, respectively.

FIGURE 14 - HYDRIC SOIL



SOIL LOSS

Average soil erosion rates by water on cultivated and noncultivated cropland in the Auglaize River Watershed has declined from about 2.3 T/Ac/Year in 1982 to about 1.3 T/Ac/Year in 1997.

Using land capability classes, average annual soil erosion rates on cropland from 1982 to 1997 were estimated from NRI as follows:

TABLE 10 - AVERAGE ANNUAL SOIL EROSION RATES ON CROPLAND

Land Capability Subclass	Soil Erosion Rate (T/Ac/Year)			
	1982	1987	1992	1997
I	Not Estimated			
Ile	4.8	4.1	3.3	2.2
IIs	4.8	4.3	2.7	2.7
Ilw	1.8	1.6	1.3	0.9
IIIe	10.4	11.0	4.2	4.0
IIIs	0.8	0.7	0.8	1.0
IIIw	1.4	1.2	1.2	1.0
IVe	5.2	9.6	5.7	2.6
VIe	5.6	4.5	7.7	4.7
VIIe	11.6	17.3	34.0	31.1

FIGURE 15 - 1997 ANNUAL GROSS CROPLAND SOIL LOSS BY LAND CAPABILITY SUBCLASS (TONS/YEAR AND PERCENTAGE)

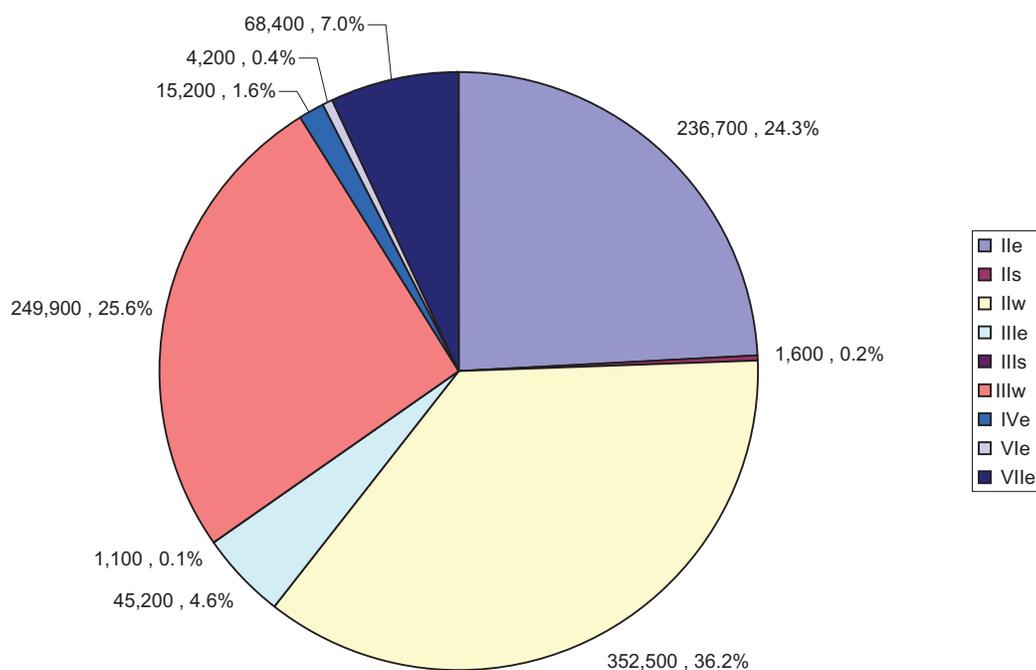


TABLE 11 - ESTIMATED 1997 GROSS SOIL LOSS FROM CROPLAND BY LAND CAPABILITY SUBCLASS

Land Capability Subclass	Acres	Percent of Watershed
Ile	236,700	24.3%
IIs	1,600	0.2%
IIw	352,500	36.2%
IIIe	45,200	4.6%
IIIs	1,100	0.1%
IIIw	249,900	25.6%
IVe	15,200	1.6%
VIe	4,200	0.4%
VIIe	68,400	7.0%
	974,800	100.0%

ANALYSIS OF SOIL EROSION POTENTIAL WITHIN THE WATERSHED

The flat nature of this watershed often masks differences in soil erosion potential when typical highly erodible land measurements are used. For this reason, soil erosion potential was calculated for each map unit in the watershed by multiplying the Rainfall Factor (R) times the Soil Erodibility Factor (K) times the Length Slope Factor (LS). These resulting values were grouped by ranges. The higher the resulting RKLS value, the greater the potential for the soil to erode.

Figure 18 depicts areas within each range. Areas that are yellow, orange, or red show highest inherent potential for the soil to erode. This analysis does not account for any land treatment in place that will affect the actual rates of erosion. It only measures potential.

FIGURE 16 - SOIL EROSION POTENTIAL (R x K x LS)

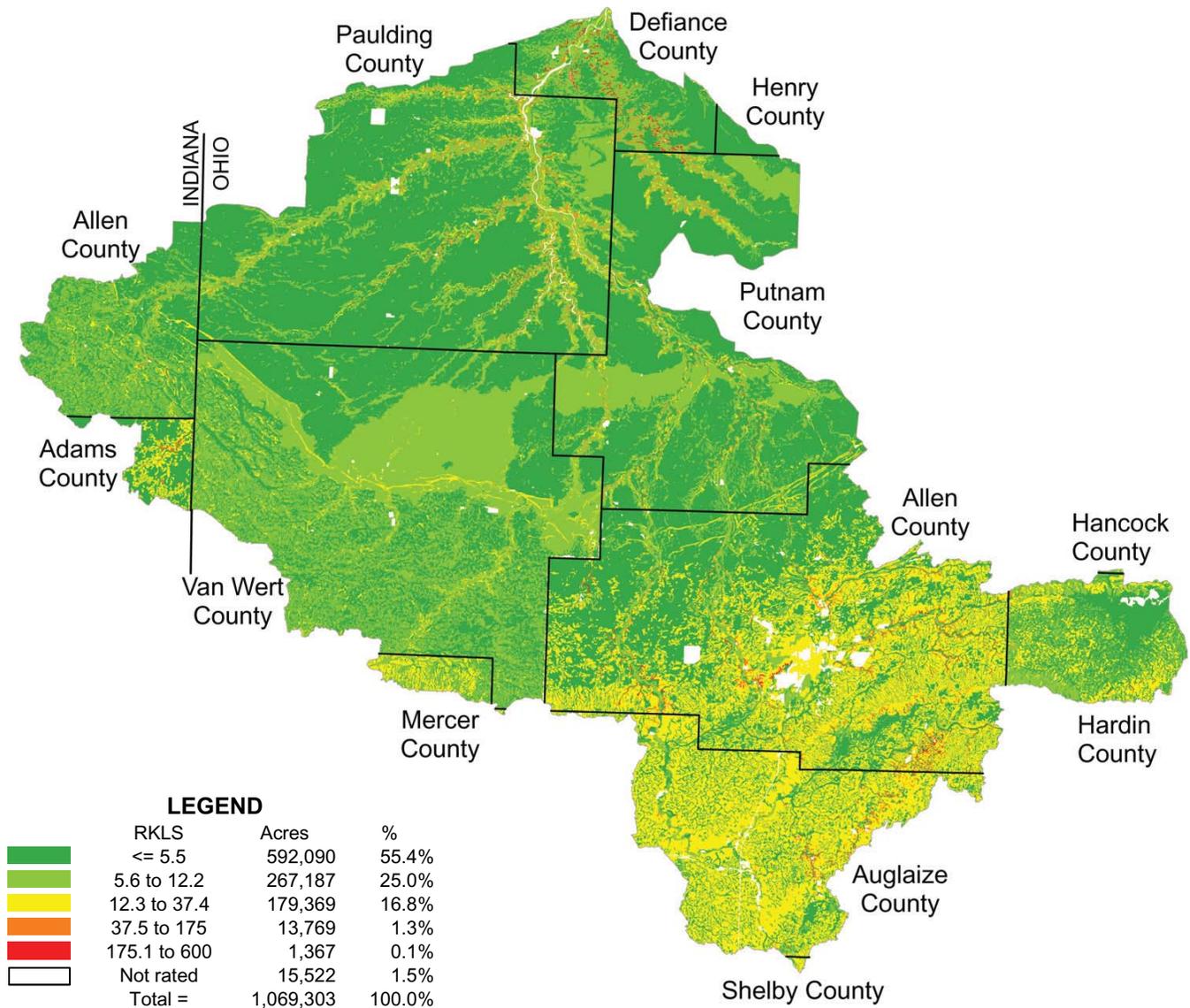
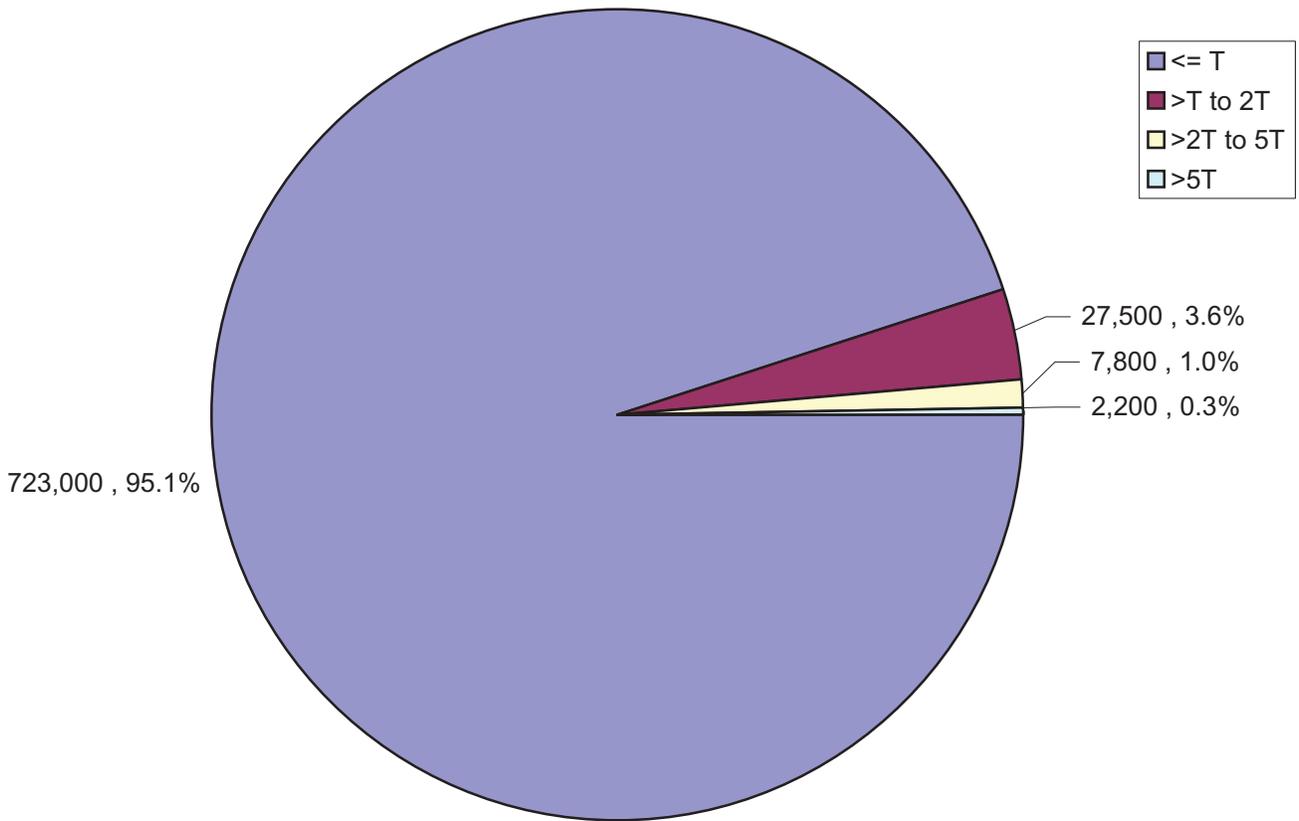


FIGURE 17 - 1997 CULTIVATED CROPLAND SOIL EROSION RATES AS A MULTIPLE OF "T" (ACRES)



Ephemeral Gully Erosion



Sheet Erosion

FLOOD PLAIN SOILS

Soils formed in recent alluvium on naturally occurring flood plains comprise about 42,500 acres or about 4.2 percent of the Auglaize Watershed. These soils are on relatively narrow flood plains along streams that commonly occur at the base of sloping to very steep uplands. These soils formed in recent deposits of alluvium that were deposited by stream bank overflow. These soils may flood frequently (usually about once per year), occasionally (usually about once every other year), and some soils may only flood rarely. Soil maps identify alluvial soils by soil map unit name and they interpret the flooding frequency and are landform based.

FIGURE 18 - FLOOD PRONE SOILS

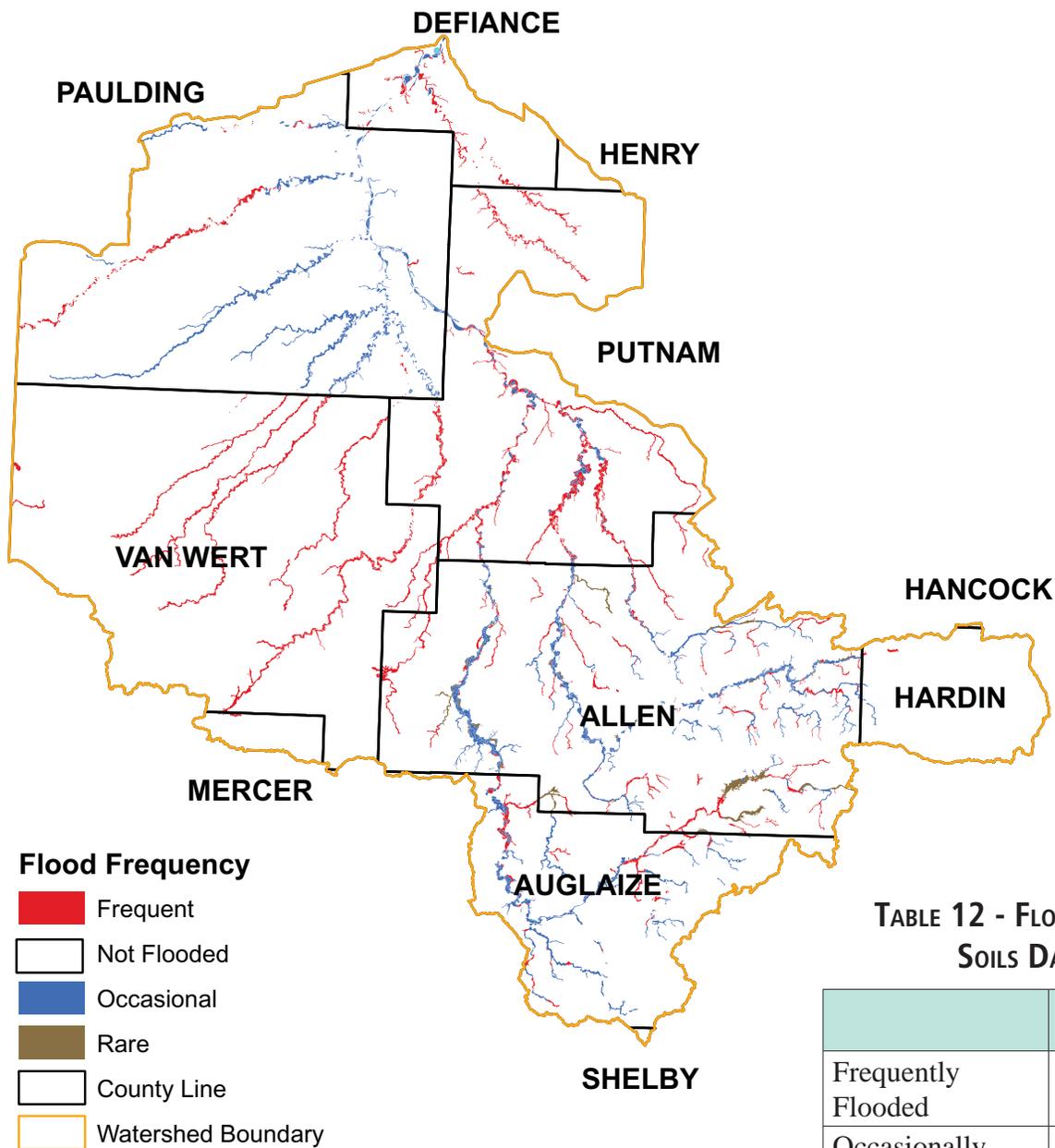


TABLE 12 - FLOOD PRONE SOILS DATA

	Acres
Frequently Flooded	21,290
Occasionally Flooded	18,960
Rarely Flooded	2,250

WATER MANAGEMENT AND FLOODING IN THE AUGLAIZE RIVER WATERSHED

Water management in the watershed must often deal with too much water, although it couldn't be the agriculturally productive area it is without plenty of rainfall. Rural drainage is very important due to the often wet, slow draining soils of much of the watershed. Highly productive agriculture depends on the maintenance of extensive drainage systems. The high resolution National Hydrography Dataset maps 3,225 miles of rivers, streams, and ditches in the watershed. This computes to a stream density of 1.93 miles of stream per square mile of drainage area. Maintaining these systems in an environmentally responsible manner is challenging from a financial and workload perspective. All counties wholly or partly in the watershed have a total of over 100 miles of open ditches, subsurface mains, and grassed waterways on their county ditch maintenance program, with several having over 200 miles.¹ The Little Auglaize River Public Law 566 channel modification project enhanced drainage outlets and provided flood reduction benefits to many miles of agricultural streams in addition to providing urban flood protection to the City of Van Wert.

Like all rivers, the watershed's rivers overflow their banks periodically causing flooding of adjacent areas. There are two active USGS stream gages in the watershed as indicated in the table below, both on the Auglaize River. Some of the peak discharges and flood stages at these two gages are also shown below.

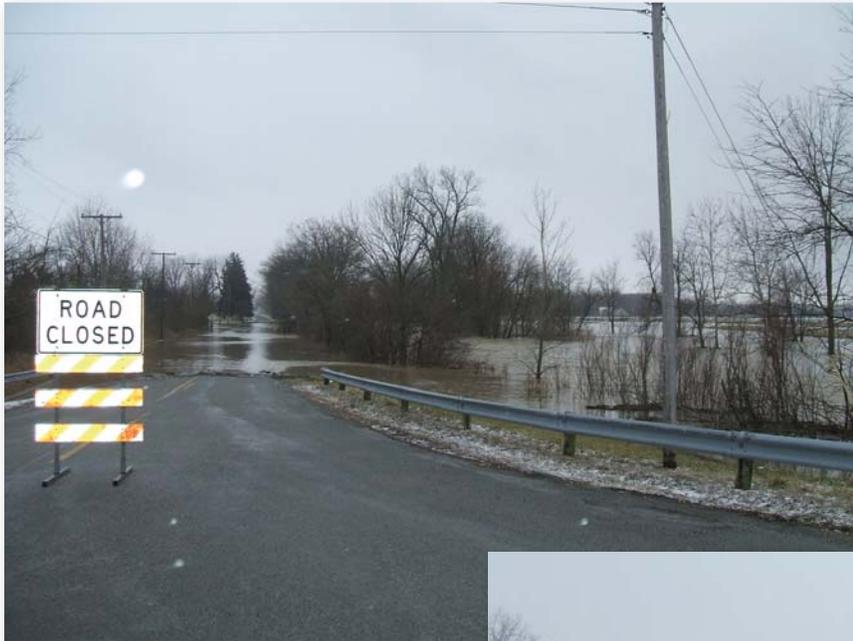
TABLE 13 - AUGLAIZE RIVER GAGE LOCATIONS AND DATA SUMMARY

Gage Station Name	Station Number	Drainage Area (mi ²)	Years of Record and Period of Record	Annual Mean Discharge (cfs)	Average Annual Runoff (inches)
Auglaize River near Ft. Jennings	04186500	332.0	81 years of record (1922-1935 and 1941-2007)	294.3	12.0
Auglaize River near Defiance	04191500	2318.0	92 years of record (1916-2007)	1,840.5	10.8

A couple of recent floods have hit the area. The storm of August 22, 2007, is included in the following table for the gage at Defiance. (It is shown below the dotted line indicating that it is not in order of magnitude since a few other historical storms have exceeded it at the gage.) This storm did extensive damage especially in the neighboring Blanchard Watershed. The storm of February 7, 2008, shows up in the gage record near Ft. Jennings as one of the highest in 81 years of record. Flooding of many roads occurred along the Auglaize River during this storm. Pictures were captured by the Allen County Engineer, of which a few are shown on the following page.

¹ Pamphlet "Rural Drainage Systems", ODNR/OFSWCD, January 2008, p.3.

AUGLAIZE RIVER FLOODING FROM FEBRUARY 7, 2008, STORM



Defiance Trail at Lincoln Highway looking North



Dogleg Road at Piquad Road looking North



Dogleg Road at Piquad Road looking South

TABLE 14 - PEAK FLOW - AUGLAIZE RIVER NEAR FORT JENNINGS

Gage #04186500 Auglaize River near Fort Jennings			
Peak Streamflow & Gage Height (Flood stage is 13.0 feet)			
Water Year	Date	Gage Height (feet)	Stream Flow (cfs)
1992	Jul. 15, 1992	19.76	12,800
1959	Jan. 23, 1959	20.3	12,000
2008	Feb. 7, 2008	19.44	11,400
1980	Jun. 03, 1980	18.45	10,400
1991	Dec. 31, 1990	18.18	9,980
1950	Feb. 15, 1950	17.8	9,550
1996	Jan. 19, 1996	17.4	8,780
1963	Mar. 06, 1963	17.2	8,710
1985	Feb. 24, 1985	17.2	8,490
2005	Jan. 13, 2005	17.13	8,450

TABLE 15 - PEAK FLOW - AUGLAIZE RIVER NEAR DEFIANCE

Gage #04191500 Auglaize River near Defiance			
Peak Streamflow & Gage Height (Flood stage is 21.0 feet)			
Water Year	Date	Gage Height (feet)	Stream Flow (cfs)
1913	Mar. 1913	38.8	120,000
1950	Feb. 16, 1950	26.4	52,500
1959	Feb. 12, 1959	26.4	52,500
1982	Mar. 15, 1982	27.39	52,300
1943	May 19, 1943	25.5	48,000
1981	Jun. 15, 1981	25.91	47,300
1985	Feb. 25, 1985	25.94	47,300
2005	Jan. 14, 2005	25.67	46,500
1991	Jan. 01, 1991	25.64	46,400
2007	Aug. 23, 2007	N/A	37,900

AIR RESOURCES INFORMATION

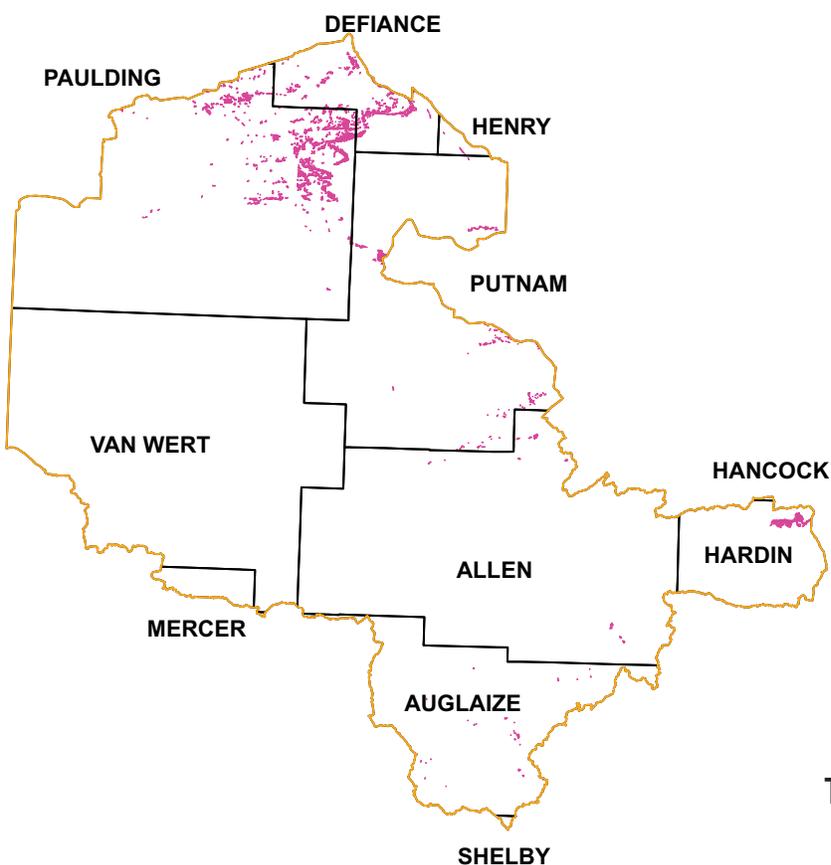
WIND EROSION

There are about 6,900 acres in the Auglaize Watershed comprised of soils subject to a severe wind erosion hazard. These soils are primarily located in Paulding County, although Defiance, Hardin, Putnam, Auglaize, and Henry Counties also have soils subject to severe wind erosion.

These soils primarily have sandy surface layers and occur on glacial beach ridges and deltas and near-shore bars on lake plains. They are subject to blowing and wind erosion if left bare during the winter and spring months. Areas of organic soils, such as Roundhead muck, are also subject to severe wind erosion in the watershed and have already been significantly degraded by primary and secondary subsidence including wind erosion.

The soil survey will identify these wind erosive soils.

FIGURE 19 -SOILS SUBJECT TO SEVERE WIND EROSION



- Severe Wind Erosion Hazard
- Watershed Boundary
- County Line

TABLE 16 - AIR RESOURCE CONCERNS TABLE

Soils Subject to Wind Erosion (acres)	
Organic Soils	Mineral Soils
860	6,040

PLANT AND ANIMAL RESOURCES

LIVESTOCK RESOURCES INFORMATION

Most of the livestock in the watershed is raised in confinement operations with the high percentage of cropland in the watershed. Pasture is a minor land use. Dairy/beef, swine, and poultry are all significant components of the livestock industry in this watershed.

Dairy produces the most manure on a dry tonnage basis, and swine manure is second. The livestock waste generated in the watershed is utilized via application to cropland. Waste is handled in both the liquid and solid form.

There are estimated to be 227 livestock operations in this watershed and 106 are estimated to have (or be following) a recent current/sufficient Comprehensive Nutrient Management Plan (or be following the 633 Waste Utilization Standard). The remaining 114 producers need a new or revised CNMP plan or partial CNMP planning assistance. There is ample land in the watershed to utilize the livestock waste generated if properly distributed. The waste generated is estimated to supply 20 percent of the total phosphorous needs for the crops grown in this watershed.

Large permitted confinement operations often generate considerable publicity and public interest. There are, however, only 12 permitted operations in this watershed, less than 5 percent of the operations in the watershed (by number).

TABLE 17 - LIVESTOCK OPERATIONS DATA

Sandusky Watershed Livestock Operations Data	Number
Total Number of Confined Livestock State Permitted Operations in the Watershed	12
Estimated Number of Non-Permitted Confined Livestock Operations in the Watershed	227
Number of Non-Permitted Facilities in the Watershed with Recent Comprehensive Nutrient Management Plans or following 633 Waste Utilization Standard	113
Estimated Number of New Comprehensive Nutrient Management Plans (CNMPs) that may be needed in the Watershed	114

**TABLE 18 - ESTIMATED LIVESTOCK ANIMAL UNITS, MANURE PRODUCTION,
AND NUTRIENT PRODUCTION**

County and Watershed Totals	AU	AU	AU	AU	Manure Production(Tons/Yr.)			Nutrient Production (1000 Lbs./Yr.)		
	Dairies	Beef	Swine	Poultry	Dairy/Beef	Swine	Poultry	N	P2O5	K2O
Adams	14,798	7,090	20,876	8,276	254,744	257,510	99,057	7,673	5,898	5,372
Allen-IN	4,239	4,911	6,290	2	95,847	77,590	15	1,899	1,248	1,395
Allen-OH	1,520	3,652	8,585	4	49,387	105,896	47	1,787	1,338	1,294
Auglaize	11,983	6,119	12,544	3,627	209,287	154,737	43,065	4,837	3,466	3,448
Defiance	13,198	1,786	1,486	3	199,083	18,333	32	2,196	1,090	1,653
Hardin	11,091	7,032	7,580	17,554	215,709	93,499	208,465	7,492	6,291	4,997
Henry	6,791	1,605	1,386	4	108,510	17,090	50	1,285	669	963
Mercer	47,947	23,703	37,358	54,133	831,214	460,822	574,634	25,601	21,027	17,272
Paulding	10,812	116	2,385	3	155,686	29,419	30	1,902	1,011	1,424
Putnam	10,452	3,006	10,508	777	164,031	129,619	9,231	3,398	2,295	2,473
Van Wert	6,041	958	3,459	1,562	92,788	42,661	18,544	1,816	1,252	1,296
Auglaize Watershed	28,746	10,313	24,808	7,731	481,022	306,012	89,786	10,327	7,267	7,377

Note: Poultry estimates err on the low side because yearly statistics do not report them. Some poultry data is taken from the 2002 Census of Agriculture, but there, as well, the data may be unreported where it would disclose individual farm numbers.

	Nutrients/Cropland Acre (Lbs/Ac/Yr)		
Auglaize Watershed	N	P2O5	K2O
Produced by animals in the watershed	13.5	9.5	9.6
Needed for crop production in the watershed	62.1	46.8	76.9

WILDLIFE AND ENDANGERED SPECIES

Wildlife habitat in much of the watershed is influenced by the predominance of land devoted to intensive cropping. In these areas, virtually all native vegetation has been removed. Most of the agricultural land provides marginal habitat for common edge or disturbance adapted species; lack of winter cover or food for resident species is severely limiting. Permanent cover in the form of woodland, wetlands, or grasslands is limited (approximately 12 percent), fragmented, and subject to a variety of disturbances. Originally, this watershed had large areas of wet woods particularly in the northern half of the watershed; now, the amount of wetland is approximately 5 percent of the watershed. Within the rural areas of the watershed, woodlands occur mostly as small isolated woodlots or narrow riparian borders. Almost no large grassland areas (CRP, old field, pasture) exist and most are subject to disturbance such as mowing which negatively impacts wildlife use. There are increasing amounts of narrow grass borders in cropland areas, but these are still very minimal in terms of benefits to wildlife.

Habitat quality in streams and rivers in the watershed is negatively impacted by excess sediments, nutrients, stream modification, and lack of permanent riparian cover in both rural and urban areas. Over 50 percent of streams are impaired for aquatic life use. Smaller tributaries and headwaters are the most severely impacted. A few reaches of the main stem of the Auglaize River support some significant habitat for fish and other aquatic species.

Due to the long-term alteration of most natural habitats, the presence of unique plant communities and threatened or endangered species is very limited. No unique plant communities are endemic to this watershed area.

Table 19 primarily reflects the limited fish and wildlife habitat associated with most of the rural and urban areas. Table 20, listing some of the rare and endangered species, only includes those species which are federally-listed as well as those listed as endangered by the State of Ohio.

TABLE 19 - HABITAT REFERENCE INFORMATION

	Availability and Condition of Wildlife Habitat				
	Much Less Than Typical State Watershed	Less Than Typical State Watershed	Comparable to Typical State Watershed	Better Than Typical State Watershed	Much Better Than Typical State Watershed
Stream Habitat	Condition degraded in many places	N/A	N/A	N/A	N/A
Grassland Habitat	Limited extent Low quality	N/A	N/A	N/A	N/A
Wetland Habitat	Limited extent Low quality	N/A	N/A	N/A	N/A
Forest Habitat	Limited extent Low quality	N/A	N/A	N/A	N/A

These designations were based on information from Ohio EPA Water Quality reports, Ohio Division of Wildlife Comprehensive Wildlife Plan, qualitative review of land cover information using broad wildlife habitat models and expert opinion

TABLE 20 - RARE OR ENDANGERED SPECIES INFORMATION

Rare or Endangered Plant Species Reported from Watershed	Rare or Endangered Animal Species Reported from Watershed
Inland Rush <i>Juncus interior</i>	Rayed Bean <i>Villosa fabalis</i>
Pale Vetchling Peavine <i>Lathyrus ochroleucus</i>	Bald Eagle <i>Haliaeetus leucocephalus</i>
	Indiana Bat <i>Myotis sodalis</i>

CONSERVATION SYSTEMS AND PRACTICE APPLICATION DATA

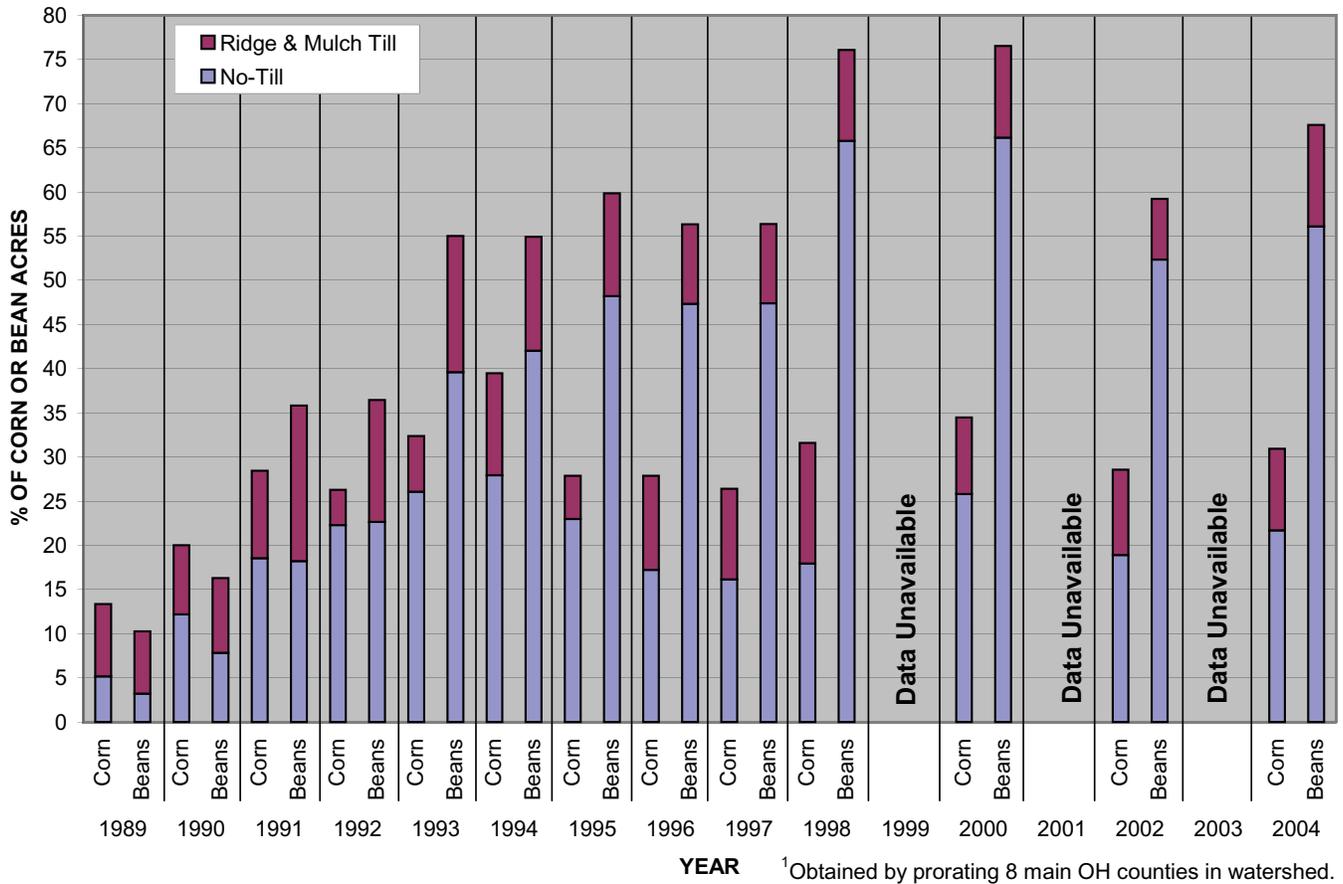
The following table was produced using the NRCS Performance Results System (PRS) and shows the application of key conservation practices and systems plus the number of conservation system acres applied by Farm Bill programs. PRS is used to track, analyze, and report NRCS conservation accomplishments. For more information on these and other reports, visit: <http://ias.sc.egov.usda.gov/PRSHOME/>.

TABLE 21 - NRCS CONSERVATION PROGRESS PERFORMANCE MEASURES

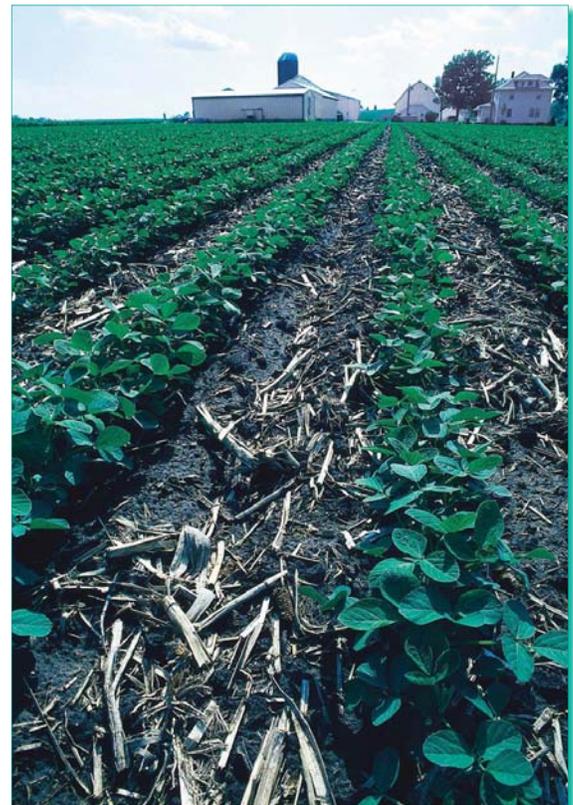
	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Total Conservation Systems Planned (acres)	15,518	22,647	17,093	25,083	75,720	35,785	37,578	224,991
Total Conservation Systems Applied (acres)	13,397	24,103	16,279	20,650	69,347	33,022	36,021	212,819
Conservation Practices								
Erosion Control Total Soil Saved (tons/year)	36,667	88,359	22,557	N/A	32,571	73,880	N/A	254,034
Filter Strips (393) (acres)	1,425	1,229	996	221	436	485	363	4,934
Grassed Waterways (412) (acres)	33	55	39	14	417	12	16	572
Prescribed Grazing (528 and 528A) (acres)	0	150	145	0	34	36	1,414	1,779
Residue Management (329A-C) (acres)	7,876	16,371	10,695	17,994	56,206	27,362	12,930	131,440
Riparian Forest Buffers (391) (acres)	31	193	96	20	59	4,553	3	4,935
Tree and Shrub Establishment (612) (acres)	91	228	206	4,427	7	10	52	594
Total Nutrient Management (acres)	12,218	19,817	14,033	18,015	52,860	22,164	24,223	145,315
Total Waste Management (313) (numbers)	3	8	1	1	3	4	2	21
Total Wetlands Created, Restored, or Enhanced (acres)	32	98	76	13	82	82	95	465
Total Wildlife Habitat (644 - 645)	643	1,549	1,022	343	78	3,607	19,109	26,008
Acres Enrolled in Farm Bill Programs								
Conservation Reserve Program	5,898	3,834	1,664	N/A	3,641	3,561	4,282	18,598
Environmental Quality Incentives Program	1,099	489	376	N/A	2,177	1,444	3,197	5,585
Farm and Ranch Lands Protection Program	0	0	0	N/A	0	0	0	0
Wetlands Reserve Program	6	11	0	N/A	5	40	38	62
Wildlife Habitat Incentives Program	0	258	1,136	N/A	0	0	0	1,394

Performance Results System (PRS) data was extracted (at the Hydrologic Unit Code level) for conservation systems and practices for six years (starting in fiscal year 2001). Information at the hydrologic unit code level was not available where N/A is listed. For more information on these and other performance reports, visit: <http://ias.sc.egov.usda.gov/PRSHOME/>.

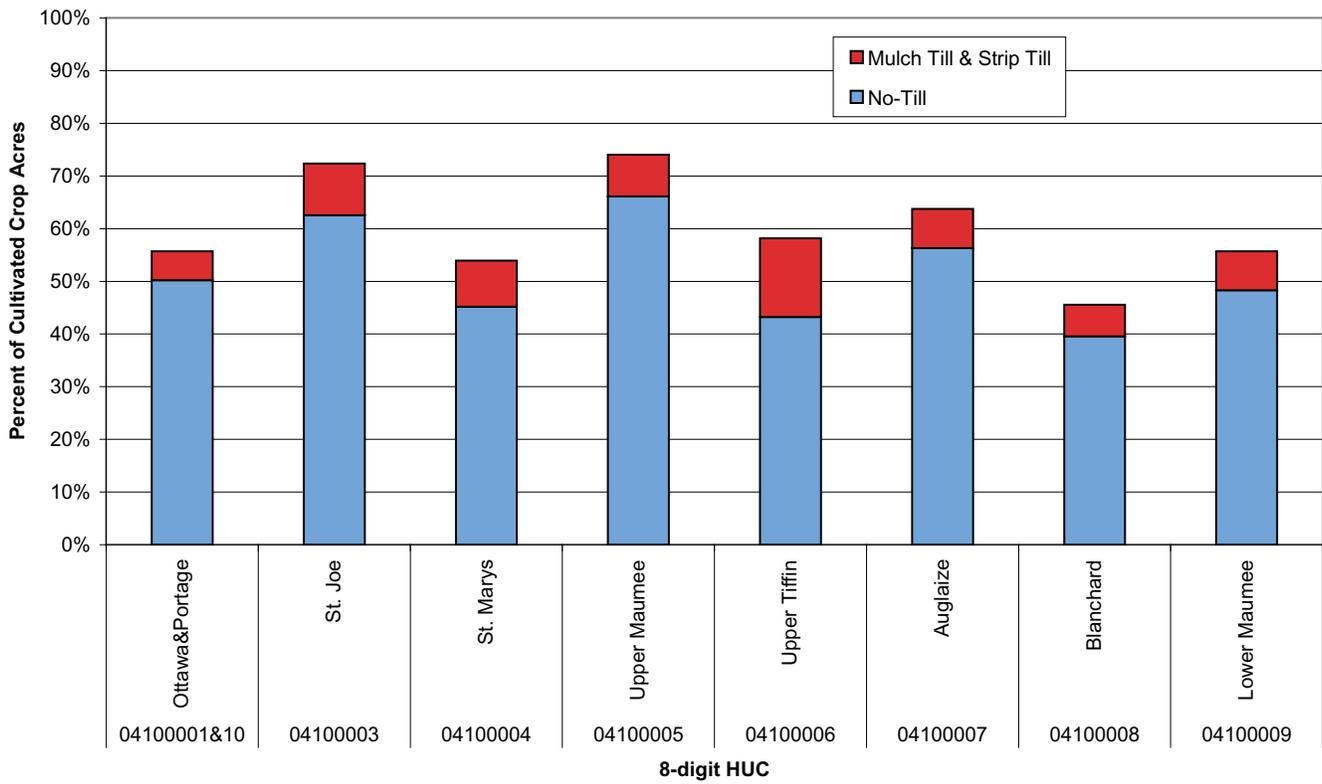
FIGURE 20 - CONSERVATION TILLAGE TRENDS



*Corn and soybeans
planted in crop residue.*



**FIGURE 21 - 2006 CONSERVATION TILLAGE CORN, SOYBEANS, AND WHEAT
(BY 8-DIGIT HUC)**



**FIGURE 22 - 2006 CONSERVATION TILLAGE CORN AND BEANS
(BY 8-DIGIT HUC)**

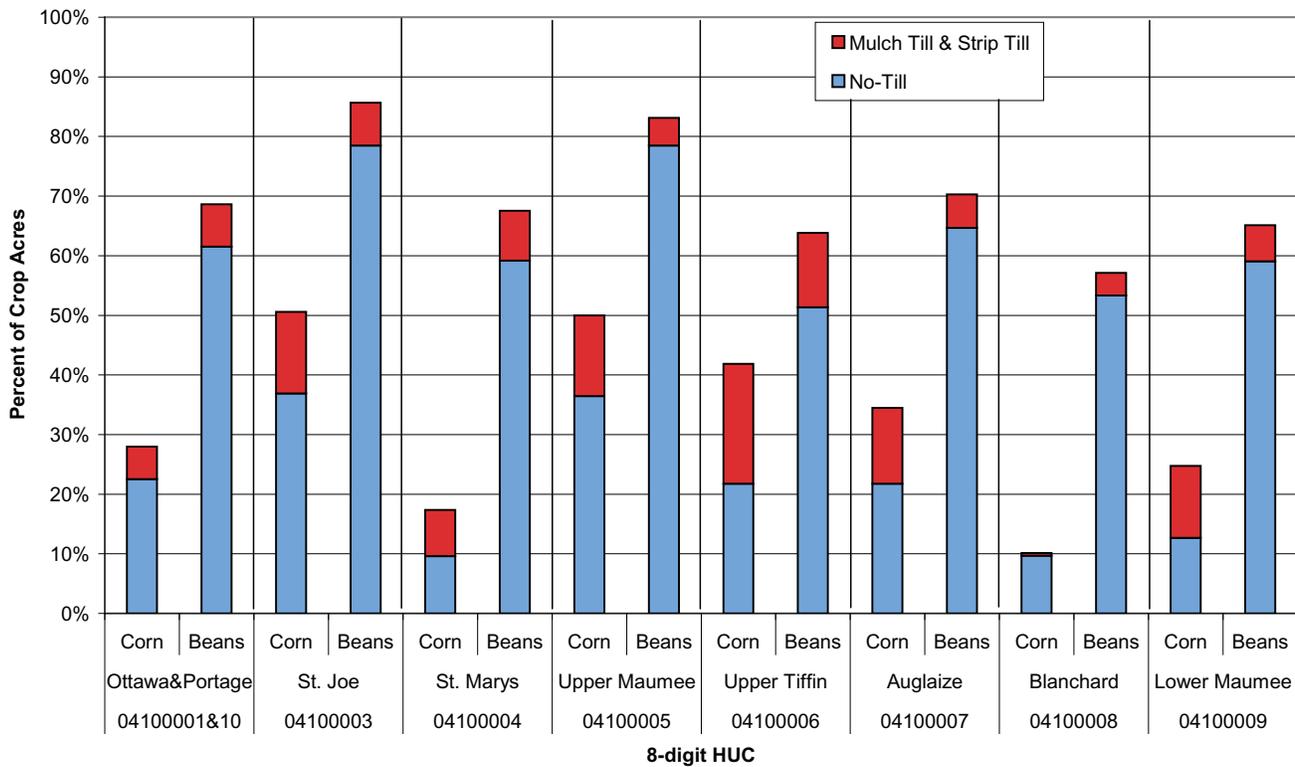


TABLE 22 - AGRICULTURAL CENSUS DATA AND ECONOMIC INFORMATION

AUGLAIZE RIVER WATERSHED AGRICULTURAL DATA AND NRCS FINANCIAL ASSISTANCE														Watershed Data ¹
USDA Census of Agriculture - 2007	Total County Data													
	Adams-IN	Allen-IN	Allen-OH	Auglaize	Defiance	Hancock	Hardin	Henry	Mercer	Paulding	Putnam	Shelby	Van Wert	
Farms (number)	1,315	1,649	946	1,059	1,141	922	847	881	1,302	754	1,316	1,050	696	3,649
Land in farms (acres)	182,490	254,136	187,238	213,296	233,213	247,981	256,822	232,238	293,026	255,564	303,751	217,969	246,497	926,479
Average size of farm (acres)	139	154	198	201	204	269	303	264	225	339	231	208	354	267
Harvested cropland (acres)	158,853	215,595	161,100	180,880	184,971	221,154	216,766	215,244	258,038	221,993	272,446	181,568	231,598	817,901
Market value of crop products sold (\$1,000)	61,776	89,661	64,594	65,869	64,413	\$83,949	\$85,855	\$93,450	94,280	81,157	95,224	68,164	85,756	\$304,952
Market value of livestock, poultry & products (\$1000)	97,024	27,854	23,033	72,738	22,612	\$17,138	\$95,968	\$13,924	440,909	67,824	51,532	62,305	24,323	\$185,702
Vegetables harvested for sale (farms)	53	24	10	6	7	12	12	21	14	8	19	4	5	40
Vegetables harvested for sale (acres)	125	774	-- ²	15	5	84	-- ²	3,531	103	95	1,917	17	12	1,162
National Agricultural Statistics Service														
Wheat Winter - Harvested (acres)	14,400	21,700	23,500	28,600	31,800	46,600	23,500	43,500	29,000	50,500	58,600	20,700	26,500	134,617
Corn for Grain - Harvested (acres)	63,000	72,800	55,200	59,100	49,100	73,300	78,000	66,500	90,100	49,800	68,100	65,900	65,000	232,665
Soybeans - Harvested (acres) - 2008	83,600	102,200	81,200	86,300	96,800	121,900	109,600	94,000	96,200	116,600	135,500	87,000	115,100	410,462
Dry Hay - Harvested (acres) - 2007	10,000	10,200	3,500	7,900	5,900	4,500	5,700	6,900	13,100	4,200	12,000	9,300	2,200	19,578
NRCS Conservation Program Financial Assistance from 1996 and 2002 Farm Bills														
1996 Farm Bill (includes EQIP & WRP)	\$415,115	\$79,995	\$0	\$394,908	\$170,598	\$0	\$725,337	\$16,976	\$908,675	\$36,443	\$44,769	\$178,346	\$77,159	\$453,057
Environmental Quality Incentives Program ('02-'08)	\$509,818	\$1,967,520	\$410,110	\$2,589,596	\$1,768,555	\$678,999	\$982,304	\$292,212	\$3,826,348	\$403,074	\$844,973	\$1,695,144	\$620,671	\$3,365,162
Conservation Security Program ('04-'08)	\$378,603	\$7,509,679	\$1,855,935	\$6,286,647	\$5,778,910	\$0	\$572,115	\$0	\$102,500	\$28,336,961	\$3,204,467	\$7,563,701	\$18,045,448	\$45,603,052
Wetlands Reserve Program ('02-'07)	\$0	\$2,364,240	\$0	\$0	\$323,652	\$153,990	\$1,700,382	\$0	\$0	\$177,275	\$0	\$0	\$200,753	\$902,316
Wildlife Habitat Incentives Program ('02-'08)	\$0	\$73,675	\$0	\$0	\$26,155	\$5,585	\$40,542	\$0	\$7,196	\$0	\$10,000	\$17,223	\$0	\$23,526
Farm and Ranch Lands Protection Program('02-'07)	\$0	\$0	\$0	\$0	\$120,042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,244
Grassland Reserve Program ('03-'08)	\$0	\$15,470	\$0	\$0	\$7,260	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,892
Total 1996-2008 NRCS Administered Program Dollars	\$1,303,536	\$12,010,579	\$2,266,045	\$9,271,151	\$8,195,172	\$838,574	\$4,020,680	\$309,188	\$4,844,719	\$28,953,753	\$4,104,209	\$9,454,414	\$18,944,031	\$50,365,249

¹ Prorated by county area in watershed.

² Data not disclosed.

WATERSHED PROJECTS AND PLANNING INFORMATION

TABLE 23 - LOCAL WATERSHED RELATED ORGANIZATIONS IDENTIFIED IN THE WATERSHED

Organization Name	Description/Purpose/Benefits	Contact Information	Type of Group (Govt., NGO, partnerships)
National Center for Water Quality Research	The NCWQR supports the sustainable use of our nation’s water resources and the protection of human health and ecological integrity as they are affected by the quality of these resources.	Website: www.heidelberg.edu/WQL Email: ncwqr@heidelberg.edu	Institution for Higher Education
Natural Resources Conservation Service	Ohio NRCS mission: Helping Ohioans protect their land and our environment.	Website: http://www.oh.nrcs.usda.gov/ Contacts: http://www.oh.nrcs.usda.gov/contact	Federal Government
Soil and Water Conservation Districts for each county in the Watershed	Conservation districts are locally organized self-governing bodies chartered by the State. Through voluntary action and cooperation of landowners (and other stake holders), the district works to conserve land, water, forest, wildlife, and other related resources for the benefit of all.	Website: http://www.nacdnet.org/about/districts/websites/	State and Local Government
Town Creek Watershed Group	Started in 2009 to address local watershed problems.	Van Wert SWCD 419-238-9591 Van Wert OSU Extension 419-238-1214	Partnership (govt. grant)
Town Creek Water Quality Study	Started in 1989 to document nutrient and chemical levels in Town Creek. Three sites sampled monthly. Funded by Van Wert County Foundation.	Van Wert SWCD 419-238-9591	Partnership
U.S. Geological Survey	The USGS collects, maintains, and analyzes quantitative and qualitative data for streams, reservoirs, and groundwater.	Website: http://oh.water.usgs.gov/ Contact: http://www.usgs.gov/ask/index.html	Federal Government

Source: <http://ohiowatersheds.osu.edu/>

TABLE 24 - LIST OF RELEVANT PUBLISHED WATERSHED PLANS, STUDIES, REPORTS

Name	Description
Drinking Water Source Protection Plans	Public water systems within watershed with Drinking Water Source Protection Plans. Program administered by Ohio EPA. Website: http://www.epa.state.oh.us/ddagw/pdu/swap_securelogin.html
FEMA Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FIS).	Available for most Ohio villages and cities and unincorporated areas in Ohio on the flood map link at the website: www.fema.gov/hazard/flood/index.shtm Paper and digital copies of maps are issued by FEMA. The maps show areas subject to flooding.
Groundwater Pollution Potential County Maps and Reports	Prepared using the DRASTIC system using existing data to rank areas with respect to relative vulnerability to contamination. Available for all counties in the Auglaize hydrologic unit. Available at http://ohiodnr.com/water/gwppmaps/default/tabid/3541/Default.aspx
Groundwater Resources County Maps	These maps show the expected water yield to a drilled well at any location in a county. Available at http://ohiodnr.com/water/Home/gwrmaps/default/tabid/3629/Default.aspx
Upper Auglaize River Watershed TMDL	Total Maximum Daily Load Report by the Ohio Environmental Protection Agency, 2004. Available at http://www.epa.state.oh.us/dsw/tmdl/AuglaizeRiverUpperTMDL.html
Upper Auglaize Watershed AGNPS Modeling Project Final Report	An interagency effort to use a Geographic Information System (GIS)-based modeling approach for assessing and reducing pollution from agricultural runoff and other nonpoint sources. Available at: http://www.oh.nrcs.usda.gov/programs/agnps/up_auglaize_ws_agnps_final_report.html

SUMMARY AND OBSERVATIONS OF WATERSHED RESOURCE CONCERNS

- Of the seven Maumee Basin 8-digit subbasins, the Auglaize is the largest in area (1,069,300 acres) and second in total population (206,846 in 2000 Census).
- This watershed is predominantly flat with more than 85 percent of the land having 2 percent slope or less.
- Using 2006 land use data, 71 percent of the subbasin is cropland and 84 percent of the cropland is corn and soybeans.
- There are 3,225 miles of streams in the watershed. Fifty-five percent of these are first order streams (headwaters of the watershed). Stream and ditch density computes to 1.93 miles of stream per square mile of drainage area.
- Eight and one-half percent (91,045 acres) of the land within this watershed is within 120 feet of a stream.
- From 2006 data, conservation tillage (88 percent no-till and 12 percent mulch/ridge till) is practiced on 64 percent of the cultivated cropland in this watershed.
- This watershed has adequate land to utilize the livestock waste produced in the watershed and from a nutrient standpoint, capacity to utilize additional waste.
- Although surface water and groundwater are both important water sources in this watershed, surface water has predominated as the water source for large water users at a 65 percent to 35 percent split in 2005.
- Agriculture is a minor user of water in the watershed compared to other water users.
- Considering the Ohio portion of the watershed (94 percent):
 - There are 309 different soil types in the watershed. Sixty percent of the soils are nearly level and are very poorly or poorly drained and require artificial drainage for crop production.
 - Six percent of the watershed is listed as “all areas are prime farmland” plus an additional 72 percent (723,800 acres) is classed as “prime farmland if drained.” About 58 percent (585,143 acres) are classed as hydric soil.
 - About 0.7 percent (6,900 acres) of soils have a severe wind erosion hazard if left bare of vegetative cover.
 - A little over 4 percent (42,500 acres) of the watershed are soils occurring on flood plains, subject to occasional or frequent flooding.
- Water management is very important in this watershed to maintain the production of agricultural crops. Each county in the watershed has over 100 miles, and some over 200 miles, of ditches and tile mains on their county ditch maintenance program helping to drain the preponderance of poorly drained soils. Rainfall extremes cause flooding in the watershed of which recent floods on August 22, 2007, and February 7, 2008, are examples.
- A Total Maximum Daily Load (TMDL) was completed and published by the Ohio EPA for the Upper Auglaize Watershed on August 16, 2004. Changes in agricultural practices such as conservation tillage and putting land in the Conservation Reserve Program have made noticeable improvements in water quality in the watershed. However, pockets of impairment still exist and result in the three 11-digit watershed assessment units being listed as impaired for their aquatic life and recreational uses.

NEXT STEPS

Part two of the assessment process is a matrix to summarize the conservation practices and systems needed for this watershed, the amounts, and the estimated costs of implementation. This matrix is a companion document that is published separately from this data profile. Based on this assessment, the following conservation practices are significant practices that are needed and important in protecting the resources of this watershed. Also included is a listing of the USDA Farm Bill incentive programs which provide financial incentives for landowners to install these needed practices.

NEEDED CONSERVATION PRACTICES

- Comprehensive Nutrient Management Plans
- Conservation Tillage
- Cover Crops
- Drainage Water Management
- Erosion Control Structures
- Field Borders
- Field Windbreaks
- Filter Strips
- Grassed Waterways
- Nutrient Management
- Pasture and Hayland Plantings
- Riparian Forest Buffers
- Tree Plantings
- Upland Wildlife Habitat Management
- Wetland Wildlife Habitat Management
- Wetland Restoration or Creation

APPLICABLE USDA FARM BILL PROGRAMS

- Conservation Reserve Program (CRP and CREP)
- Conservation Security Program (CSP)
- Environmental Quality Incentives Program (EQIP)
- Farm and Ranch Lands Preservation Program (FRPP)
- Grazing Lands Conservation Initiative (GLCI)
- Resource Conservation and Development (RC&D) Program
- Wetlands Reserve Program (WRP)
- Wildlife Habitat Incentives Program (WHIP)

REFERENCES AND CITATIONS

1. Auglaize River Watershed 10-Meter Digital Elevation Model
Source: Ohio EPA and USGS Ohio Water Science Center derived 10-meter DEM from 7 ½ minute hypsography DLGs.
2. Auglaize River Watershed Average Annual Precipitation
Source: PRISM (Parameter-elevation Regressions on Independent Slopes Model) climate mapping system, 800-meter grid precipitation normals for 1971-2000, <http://www.ocs.oregonstate.edu/prism/products/matrix.phtml?vartype=tmax&view=maps>
Last visited on 5/14/07.
3. Auglaize River Watershed Stream Orders
Source: Stream order from National Hydrography Dataset (NHD) high-resolution streams layer, <http://nhd.usgs.gov>, as calculated by Arcview extension streamorder.avx.
4. Auglaize River Watershed Soil Erosion Potential
Source: Data Source for LS values taken from typical values for SSURGO map units contained in Field Office Technical Guide, Section II, Cropland Interpretations.
5. The Livestock Estimate was prepared from county agricultural statistics data and a procedure developed in consultation with Ohio State University Extension and others. Reported livestock county numbers were prorated on a per acre basis to each of the county 8 digit HUC units. The resulting numbers were then evaluated and adjusted if needed by local NRCS field offices and NRCS/SWCD staff based on local knowledge of where the livestock was located within the county. Standard book values were then applied to estimate the manure production for each type of livestock based on common storage and application systems for that type of livestock. The results were totaled to provide an estimate of manure and nutrient production for the watershed.

Users are cautioned that this is an estimate only for comparison purposes. There are limitations in the input data. One difficulty is that agricultural statistics data is not reported when there are few producers in a county because of confidentiality restrictions. Data is missing or unavailable in some cases for some operations.

This analysis also makes no allowances for movement of manure into or out of the watershed by operations which border the watershed boundaries, or by operators who farm land in more than one watershed. There is no available data to quantify the extent of that. Nevertheless, this analysis is a general estimate of the capacity of the watershed to properly utilize the nutrients produced within the watershed and the general need for export of waste out of the watershed, or the importation of commercial fertilizer.