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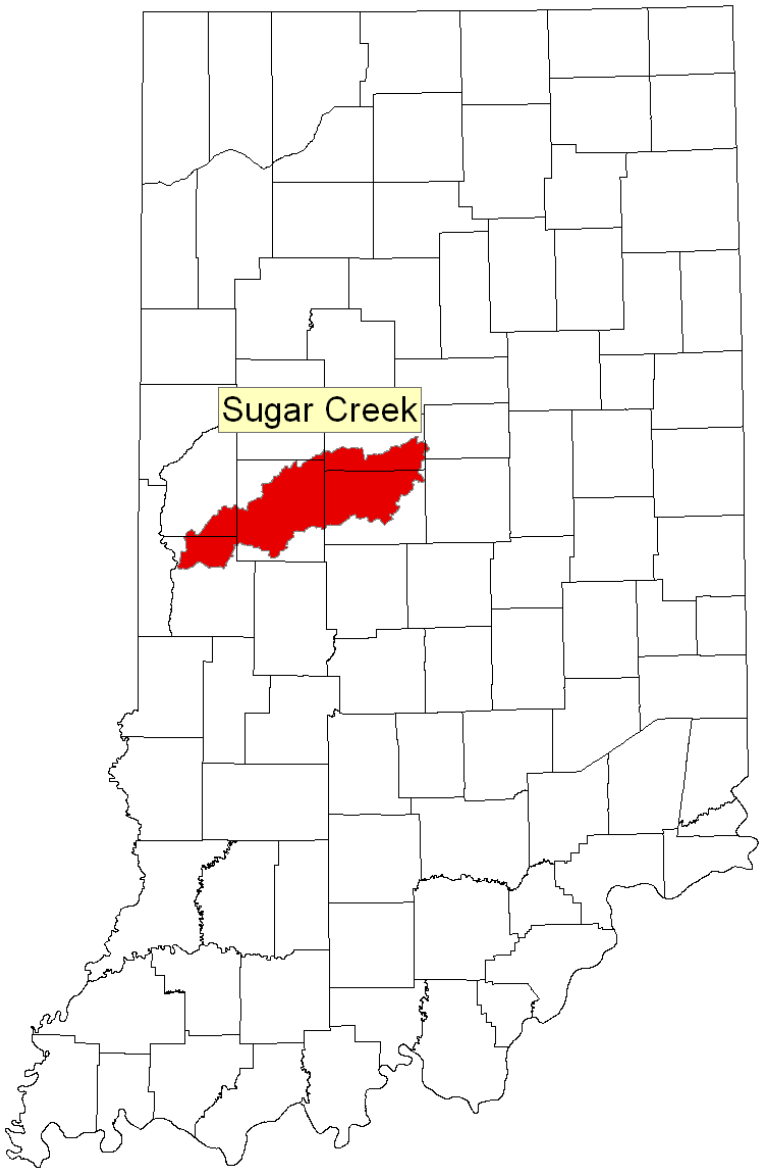
Rapid Watershed Assessment
Sugar Watershed

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



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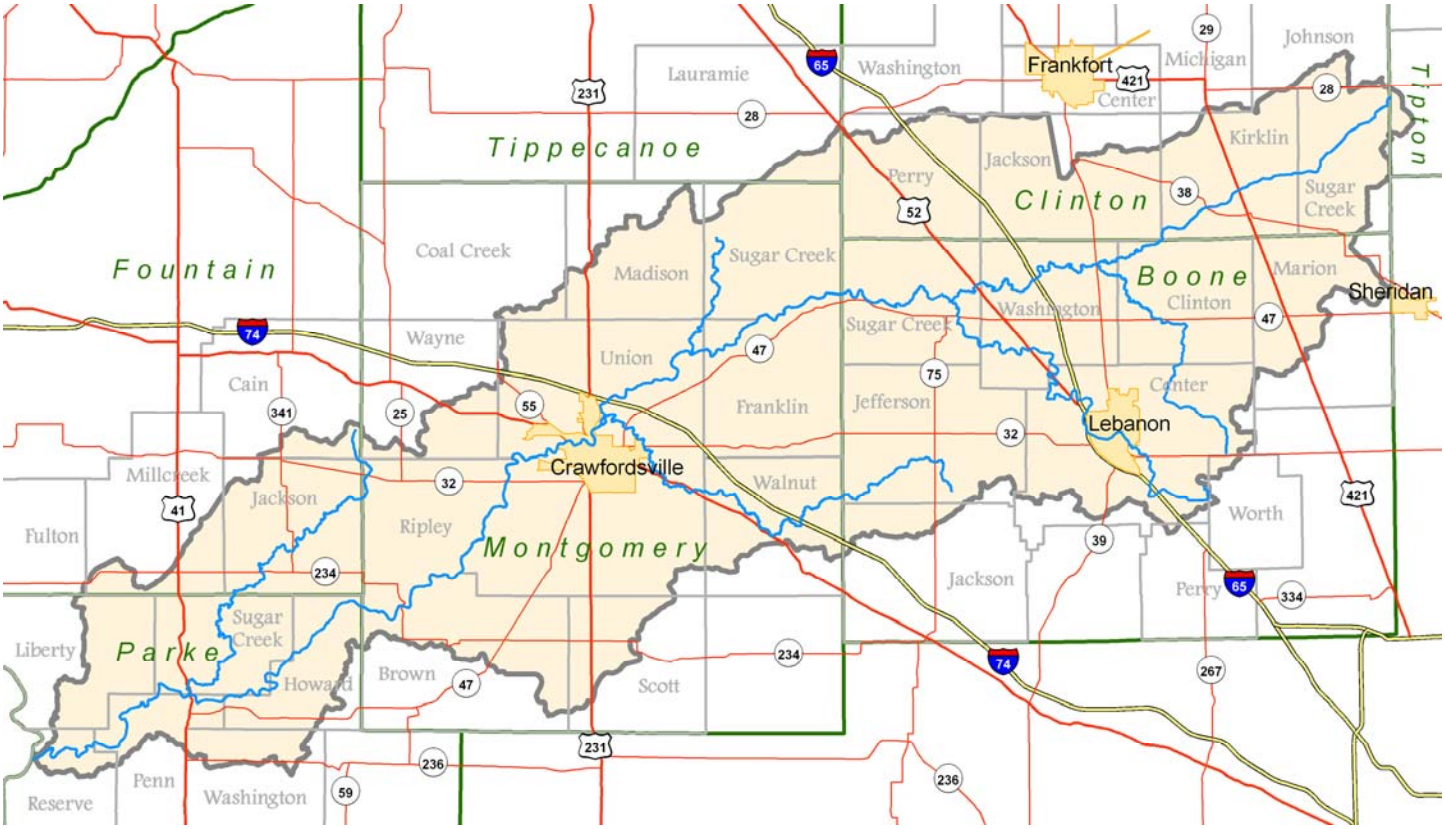
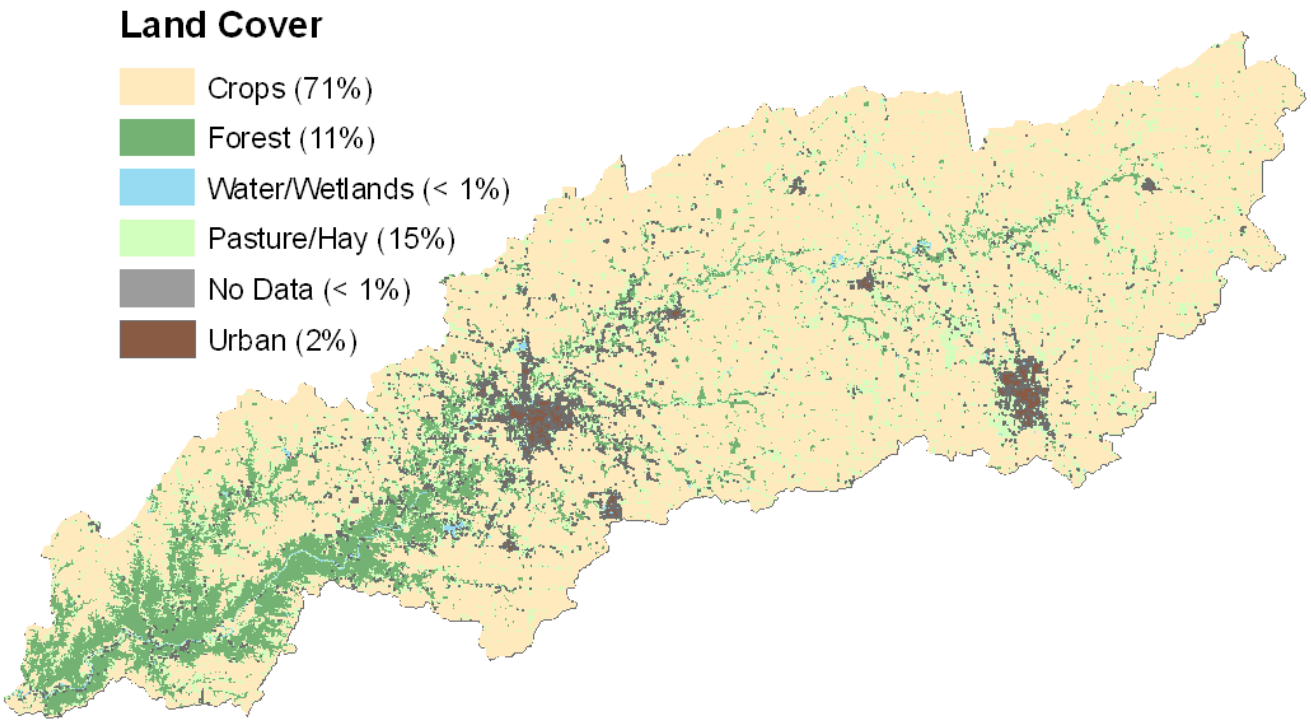
Sugar Watershed



Introduction

Sugar watershed (05120110) is located in west-central Indiana. The watershed encompasses approximately 807 square miles or approximately 516,460 acres. The watershed is broken into 34 subunits (12 digit hydrologic unit codes).The watershed is 87 percent agricultural and nearly 10 percent forest. The primary crops grown within the watershed are corn and soybeans. Livestock production is dominated by swine and poultry.



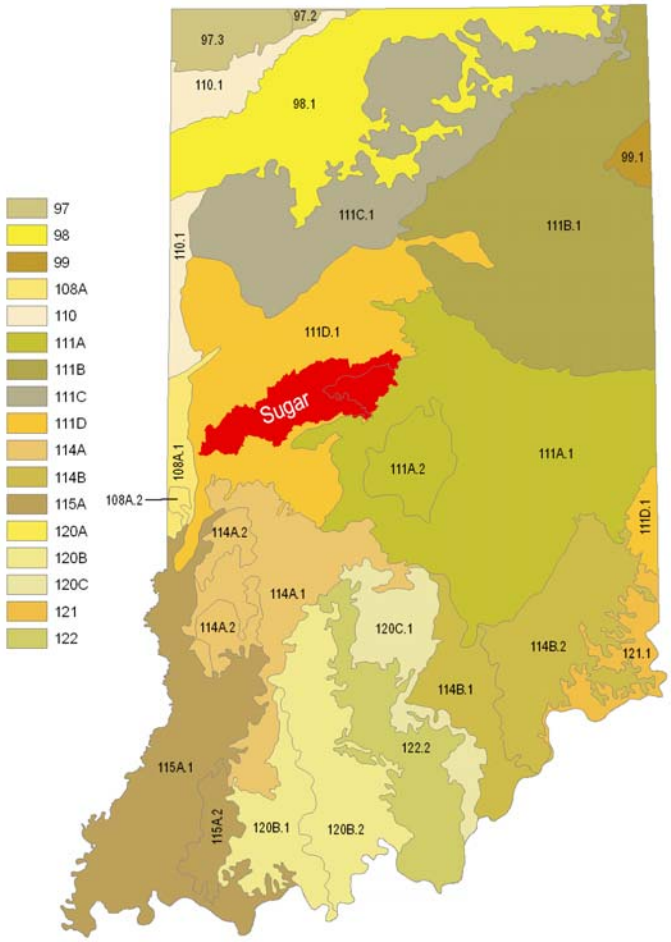
Sugar Creek is a clear running stream which travels in a generally northeast to southwest direction as it cuts across west-central Indiana. The source lies in Tipton County and the entire river length to the Wabash confluence is approximately 90 miles. Early Indians named the stream after seeing the many sugar maple trees in the area. Because of its swift water, Sugar Creek was important to the early pioneers as a source of power. The Woolen and Yountsville Mills were located along the stream and their remains can still be seen today.

Common Resource Area

There are two common resource areas in the watershed:

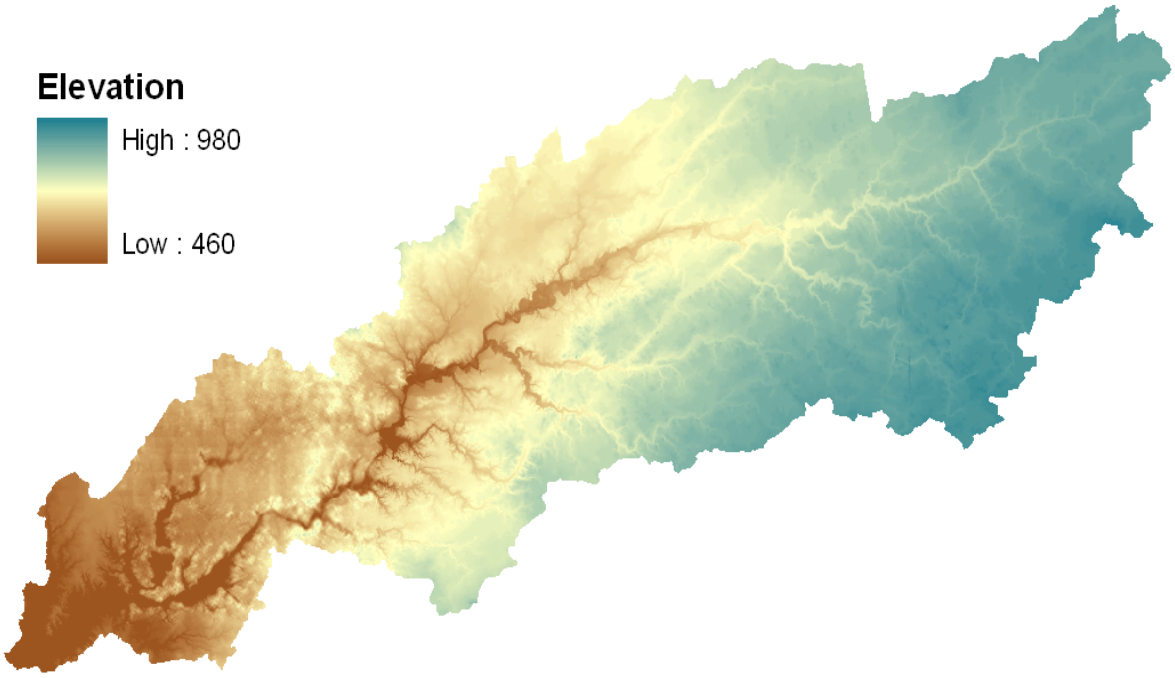
Indiana and Ohio Till Plain, Western Part (111D.1) – Relatively flat-lying ground moraine with moderate relief, cut by steep-volleyed large streams. Extensive corn, soybean and livestock farming with scattered woodlands and residential, commercial and industrial development. Soils are well drained to very poorly drained, formed in thin to moderately thick loess and Wisconsin Age glacial drift derived mostly from limestone and dolomite.

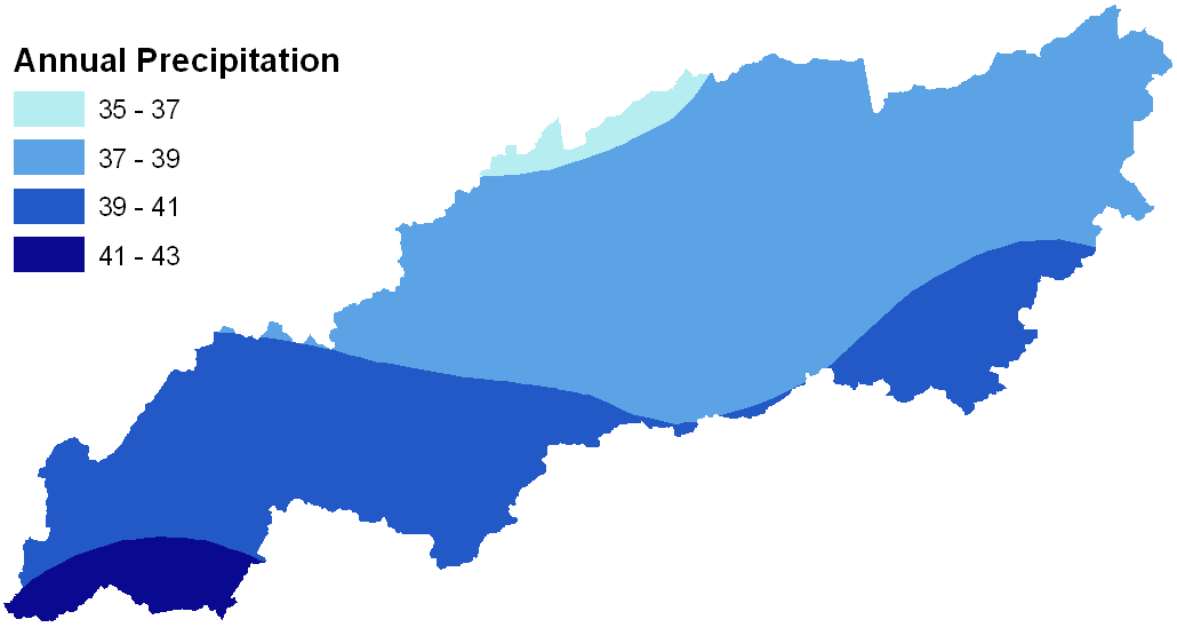
Indiana and Ohio Till Plain, Central Part (111A.1) – Level to rolling glacial till plain broken by hilly end moraines, kames, and outwash terraces with moderate relief. Corn, soybean and livestock farming with scattered woodlands in areas not affected by urban development. Soils dominantly are well drained to very poorly drained, formed in Wisconsin Age glacial drift derived mostly from limestone and dolomite.



Physical Description

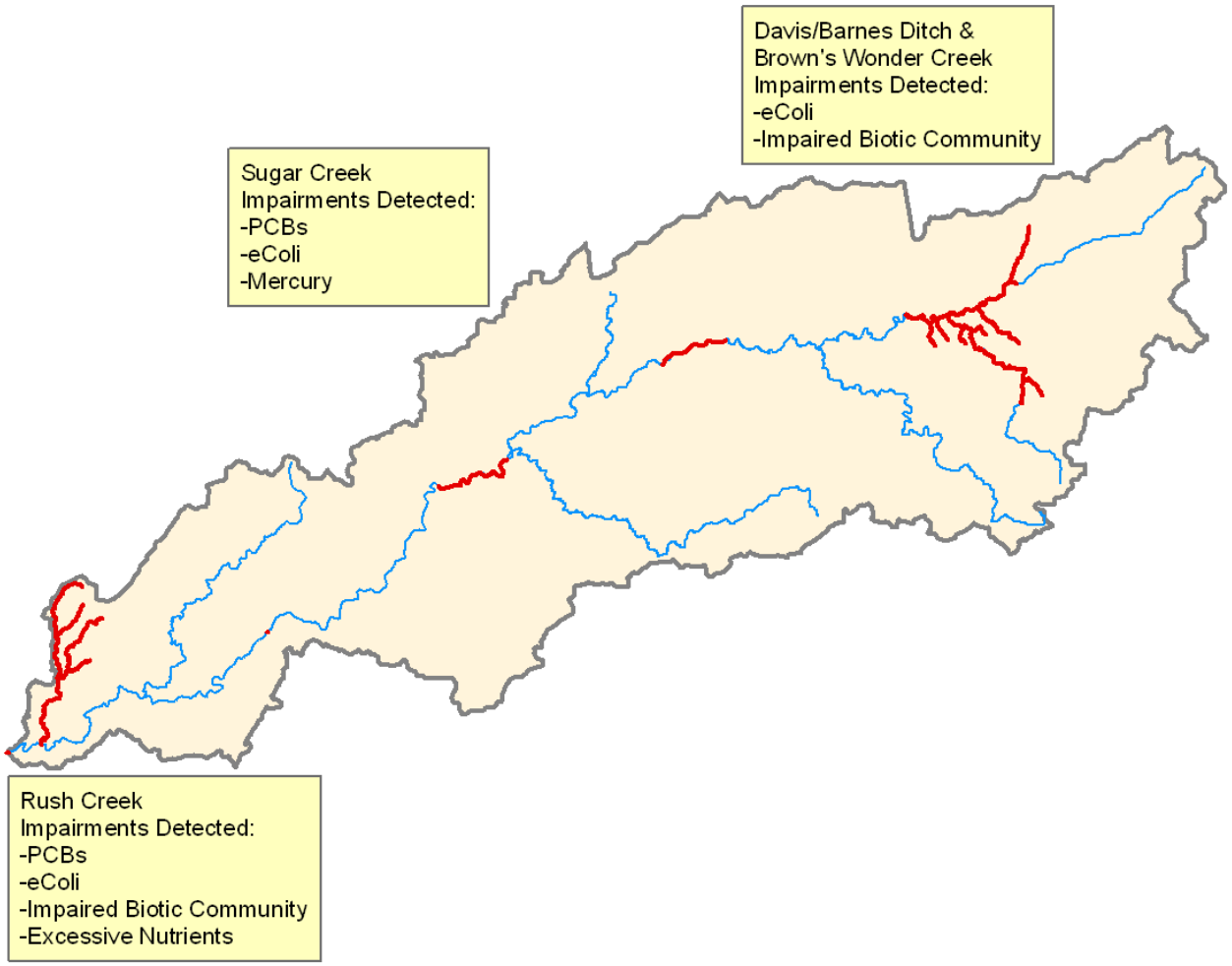
Sugar Creek originates near the Clinton-Tipton County border before flowing to the southwest for approximately 90 miles and discharging into the Wabash River near Newport, Indiana. Early Indians named this stream after seeing the many sugar maple trees in the area. Because of its swift water, Sugar Creek was important to early pioneers as a source of power. The Woolen and Yountsville Mills were located along the stream, and their remains can still be seen today. The entire Sugar watershed is located in the Eastern Corn Belt plains ecoregion, which is characterized by rolling plains, with beech/maple vegetation, and soils that are good for cropland.




Annual Precipitation
35 - 37
37 - 39
39 - 41
41 - 43

Assessment of waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. The Clean Water Act Section 303(d) list for Indiana provides a basis for understanding the current status of water quality in the Sugar Watershed.



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WATERS OF THE SUGAR CREEK
INDIANA'S 2006 303(D) LIST

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INB1043_T1005	LITTLE SUGAR CREEK	FCA for MERCURY
INB1043_T1005	Little Sugar Creek	FCA for PCBs
INB1132_T1021	OTTER CREEK	FCA for MERCURY
INB1132_T1021	OTTER CREEK	FCA for PCBs
INB1068_00	RUSH CREEK-EAST/WEST FORKS	IMPAIRED BIOTIC COMMUNITIES
INB1026_T1001	SUGAR CREEK	FCA for MERCURY
INB1027_T1002	SUGAR CREEK	FCA for MERCURY
INB1051_T1006	SUGAR CREEK	FCA for MERCURY
INB1054_T1007	SUGAR CREEK	FCA for MERCURY
INB1056_T1008	SUGAR CREEK	FCA for MERCURY
INB1057_T1009	SUGAR CREEK	FCA for MERCURY
INB1026_T1001	SUGAR CREEK	E. COLI
INB1026_T1001	SUGAR CREEK	FCA for PCBs
INB1027_T1002	SUGAR CREEK	FCA for PCBs
INB1051_T1006	SUGAR CREEK	E. COLI
INB1051_T1006	SUGAR CREEK	FCA for PCBs
INB1054_T1007	SUGAR CREEK	FCA for PCBs
INB1056_T1008	SUGAR CREEK	FCA for PCBs
INB1057_T1009	SUGAR CREEK	FCA for PCBs
INB1059_T1010	SUGAR CREEK	FCA for MERCURY
INB1059_T1010	SUGAR CREEK	FCA for PCBs
INB105A_T1011	SUGAR CREEK	FCA for MERCURY
INB105A_T1011	SUGAR CREEK	FCA for PCBs
INB1067_T1012	SUGAR CREEK	FCA for MERCURY
INB1067_T1012	SUGAR CREEK	FCA for PCBs
INB1041_T1003	SUGAR CREEK - GARFIELD	FCA for MERCURY
INB1041_T1003	Sugar Creek - Garfield	FCA for PCBs
INB1019_00	SUGAR CREEK-BROWN'S WONDER CREEK (LOWER)	IMPAIRED BIOTIC COMMUNITIES
INB1017_00	SUGAR CREEK-DAVIS/BARNES DITCH	E. COLI
INB1069_T1013	SUGAR CREEK-MAIN STEM	FCA for MERCURY
INB1069_T1013	SUGAR CREEK-MAIN STEM	FCA for PCBs
INB1145_M1003	WABASH RIVER	E. COLI
INB1145_M1003	WABASH RIVER	NUTRIENTS
INB1174_M1005	WABASH RIVER	E. COLI
INB1174_M1005	WABASH RIVER	NUTRIENTS
INB1194_M1007	WABASH RIVER	E. COLI
INB1142_M1002	WABASH RIVER - OTTER CREEK TO ABOVE WABASH GEN STA OUTFALL	E. COLI
INB1142_M1002	WABASH RIVER - OTTER CREEK TO ABOVE WABASH GEN STA OUTFALL	NUTRIENTS
INB1138_M1001	WABASH RIVER - SPRING CREEK TO OTTER CREEK	E. COLI
INB1138_M1001	WABASH RIVER - SPRING CREEK TO OTTER CREEK	NUTRIENTS
INB1142_M1025	WABASH RIVER - WABASH GEN STA TO LOST CREEK	E. COLI
INB1142_M1025	WABASH RIVER - WABASH GEN STA TO LOST CREEK	NUTRIENTS

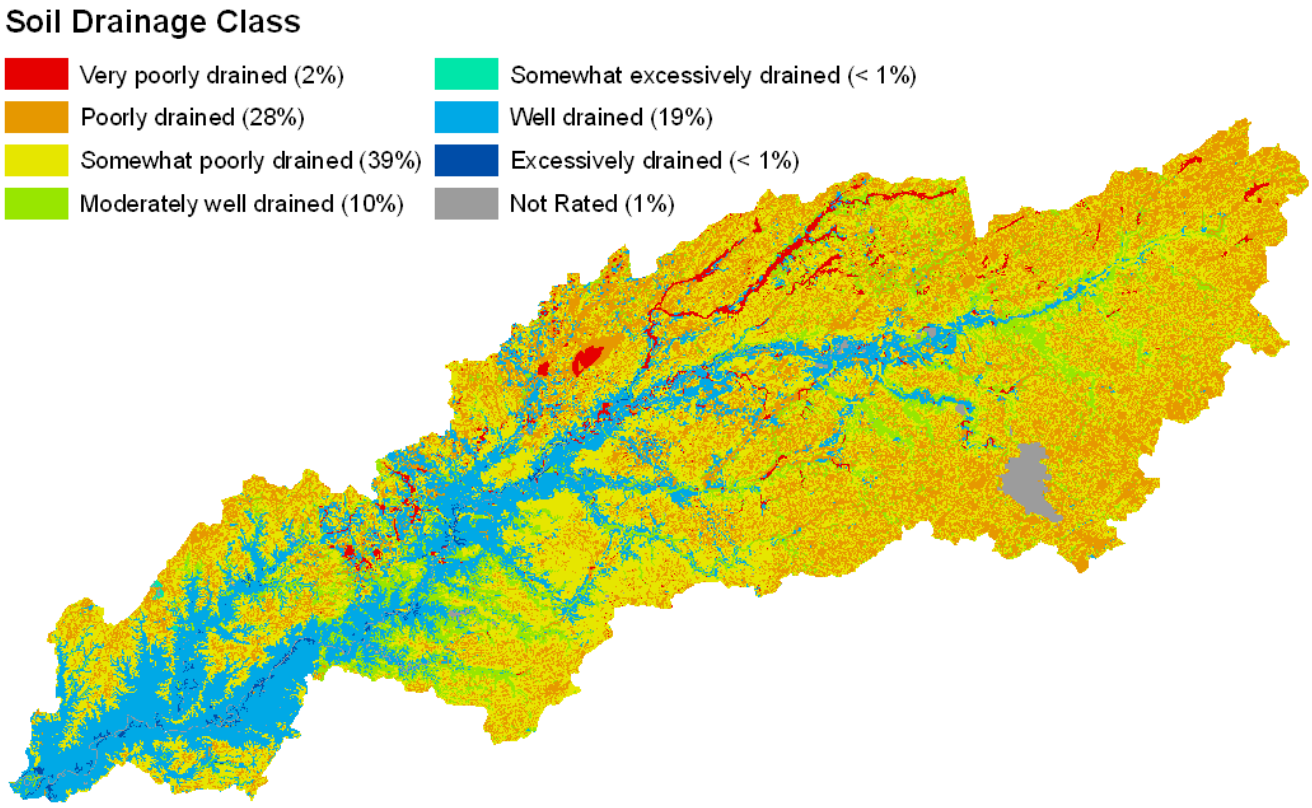
WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INB1176_M1006	WABASH RIVER-ASHMORE CREEK (ILL)	E. COLI
INB1156_M1004	WABASH RIVER-TERRE HAUTE AREA	E. COLI
INB1156_M1004	WABASH RIVER-TERRE HAUTE AREA	NUTRIENTS
INB1046_T1014	WALNUT FORK - BELOW LITTLE SUGAR CREEK	FCA for MERCURY
INB1046_T1014	Walnut Fork - below Little Sugar Creek	FCA for PCBs

Soils

The dominant soil orders in this Major Land Resource Area (MLRA) are Alfisols, Inceptisols, and Mollisols. The MLRA also has small areas of Histosols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. They are dominantly very deep, very poorly drained to well drained, and loamy or silty. The dominant kinds of parent material are till, outwash, loess, and alluvium. Hapludalfs (Celina, Miami, Miamian, Reesville, Russell, Wynn, and Xenia series) and Epiaqualfs (Crosby and Fincastle series) are on till plains. Endoaquolls (Drummer series), Argiaquolls (Cyclone, Kokomo, Mahalasville, Ragsdale, and Treaty series), and Endoaqualfs (Starks series) are on till plains or outwash plains. Haplosaprists (Houghton and Palms series) are in deep depressions and potholes. Hapludalfs (Camden, Eldean, Fox, Martinsville, and Ockley series) and Endoaqualfs (Sleeth series) are on terraces and outwash plains. Argiaquolls (Westland series) are in depressions on terraces and outwash plains. Eutrudepts (Beckville, Eel, and Genesee series), Endoaquepts (Shoals series), and Endoaquolls (Sloan series) are on flood plains.

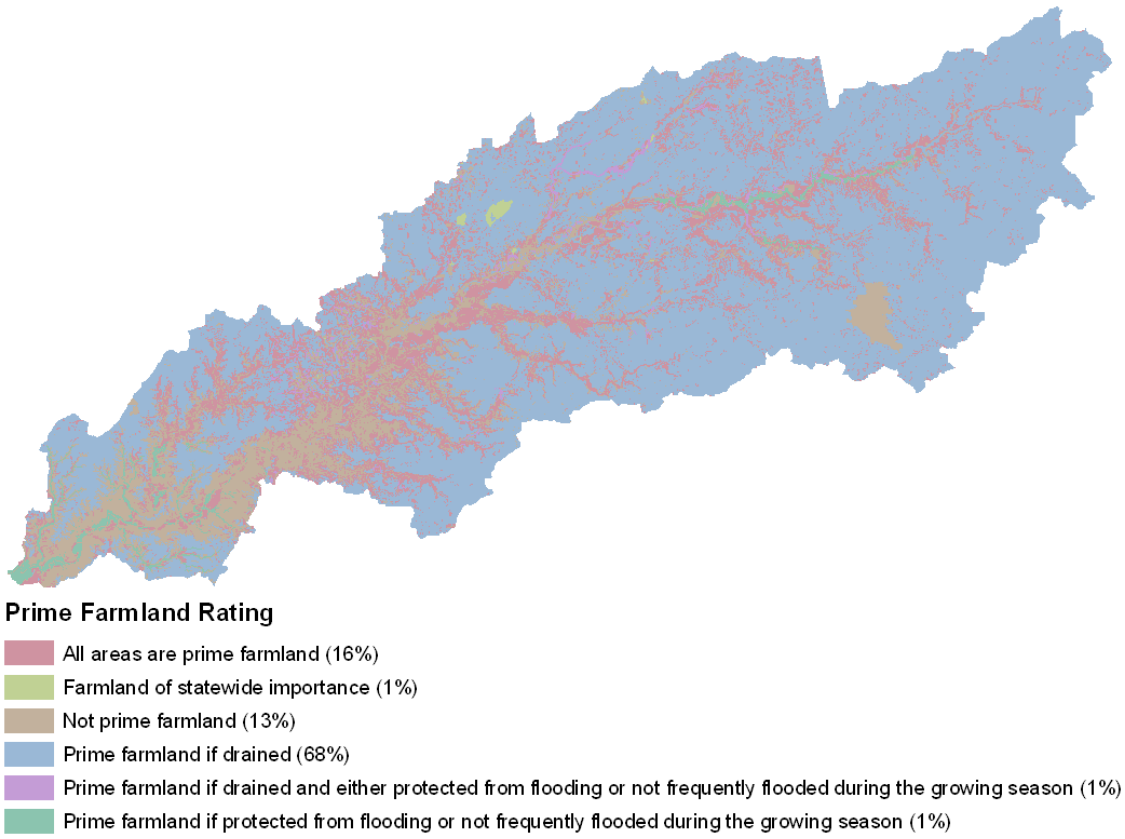
Drainage Classification

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 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.

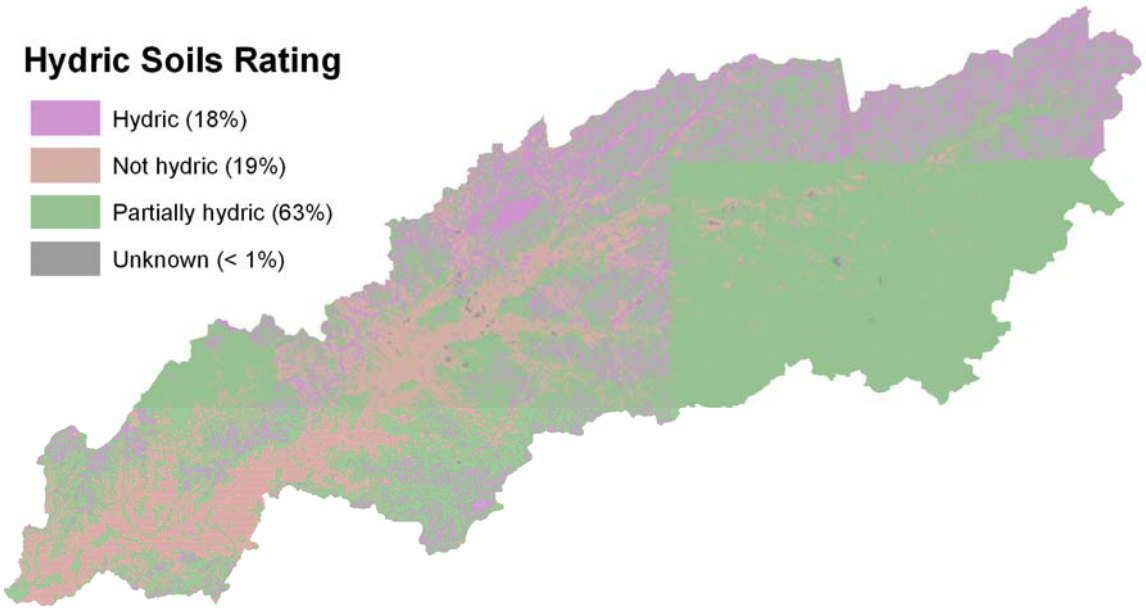


Hydric Soils

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 non-hydric soils in the higher positions on the landform, and map units dominantly made up of non–hydric soils may have inclusions of hydric soils in the lower positions on the landform.

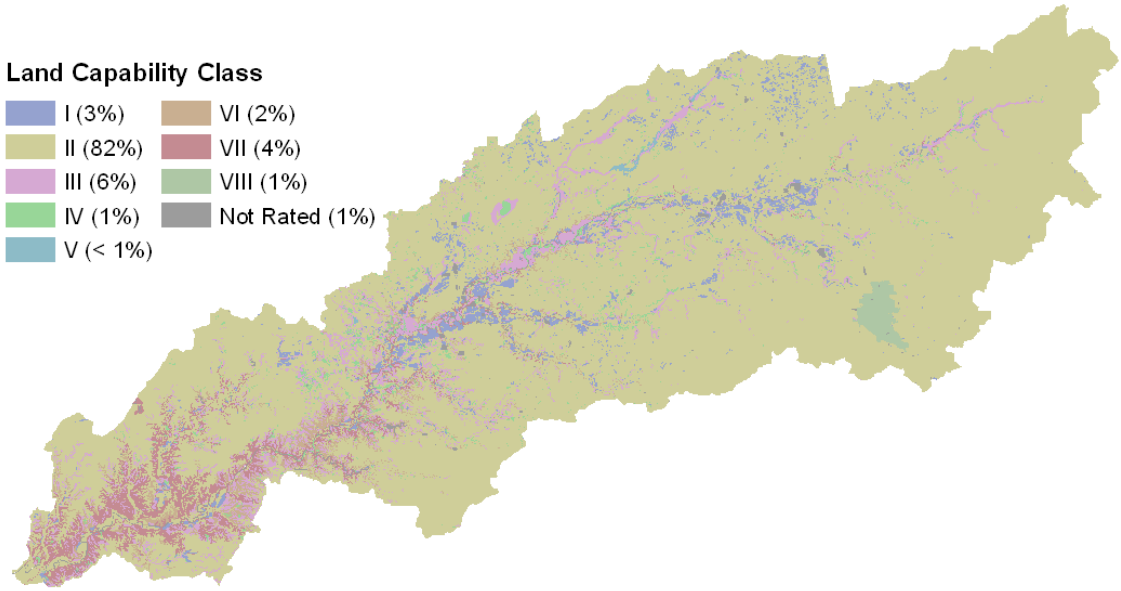
Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register 1994). These soils, under natural conditions,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

If soils are wet for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make on site determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).



Land Capability Classification

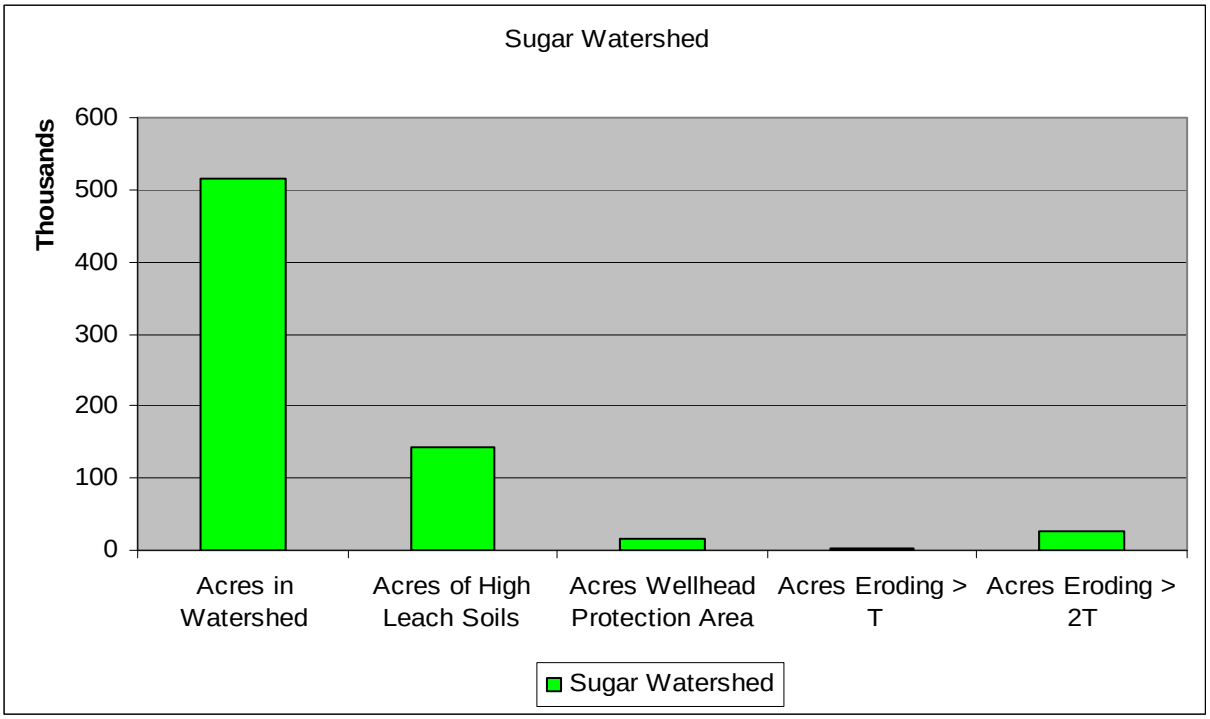
Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive land forming 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 designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.



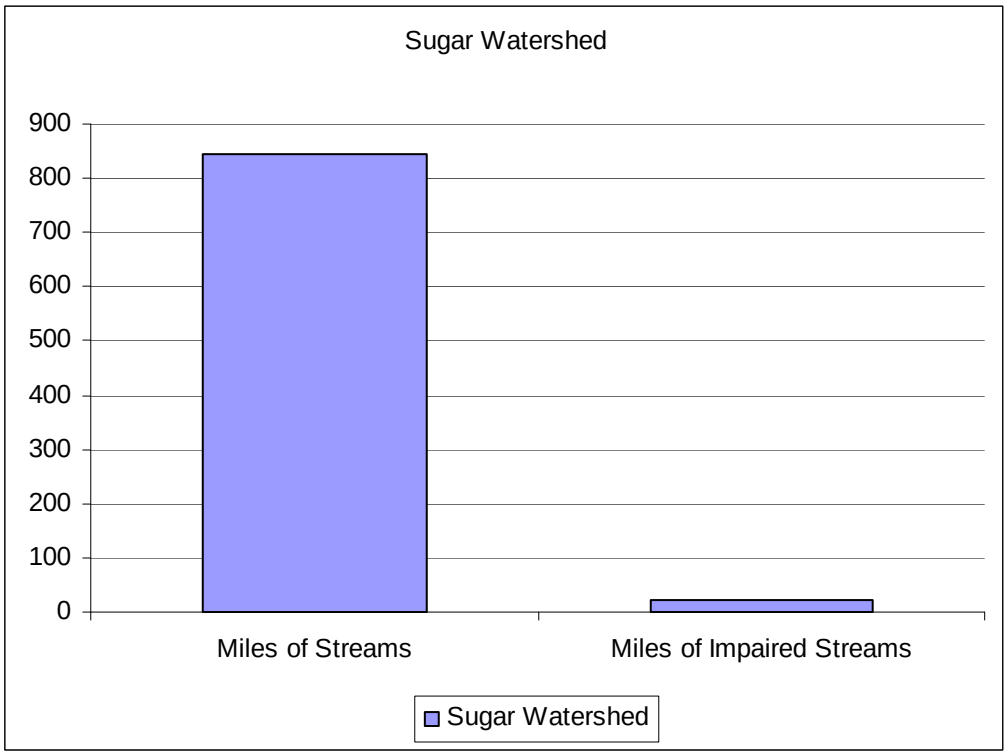
Resource Concerns

Stakeholders and electronic analysis have been identified the following resource concerns as being the top priority:

- Ground Water Quality - The watershed has in excess of 140,000 acres of soils with high leaching index (> 10) which allows contaminates on the land surface to be carried easily into the ground water from infiltrating water. Because of this condition, non–point pollutants such as fertilizers, pesticides, and livestock waste have the potential to contaminate the ground water aquifer.
- Soil Quality – The watershed has approximately 31,000 acres of soils eroding greater than the tolerable limit. Excessive Sheet and Rill Erosion and excessive gully, and streambank erosion rank high.



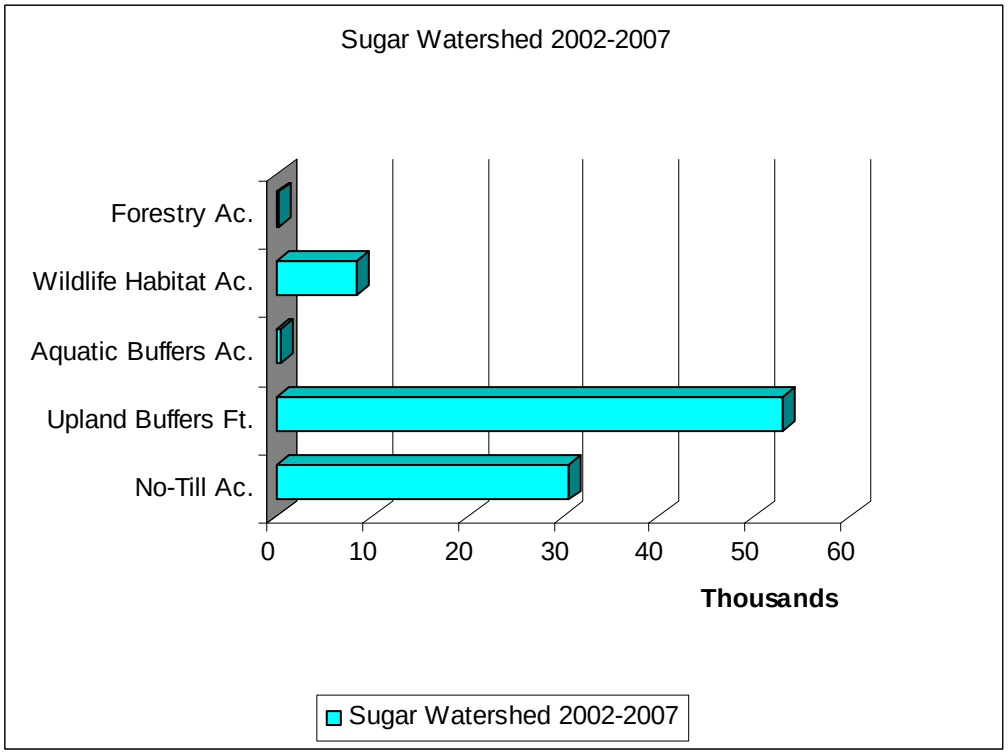
- Surface Water Quality – Approximately 3 percent of the streams within the watershed have identified impairments. Nutrients, excessive amounts of sediments, nutrients, and bacteria degrade the water quality causing an unbalanced fish community with depressed populations and limited diversity.



- Threatened & Endangered Species – Just over 14 percent of the 516,460 acres in the watershed lie within the range of known Threatened and Endangered Species.
- The Environmental Protection Agency has identified 28.6 percent of the watershed as having an air quality concern.

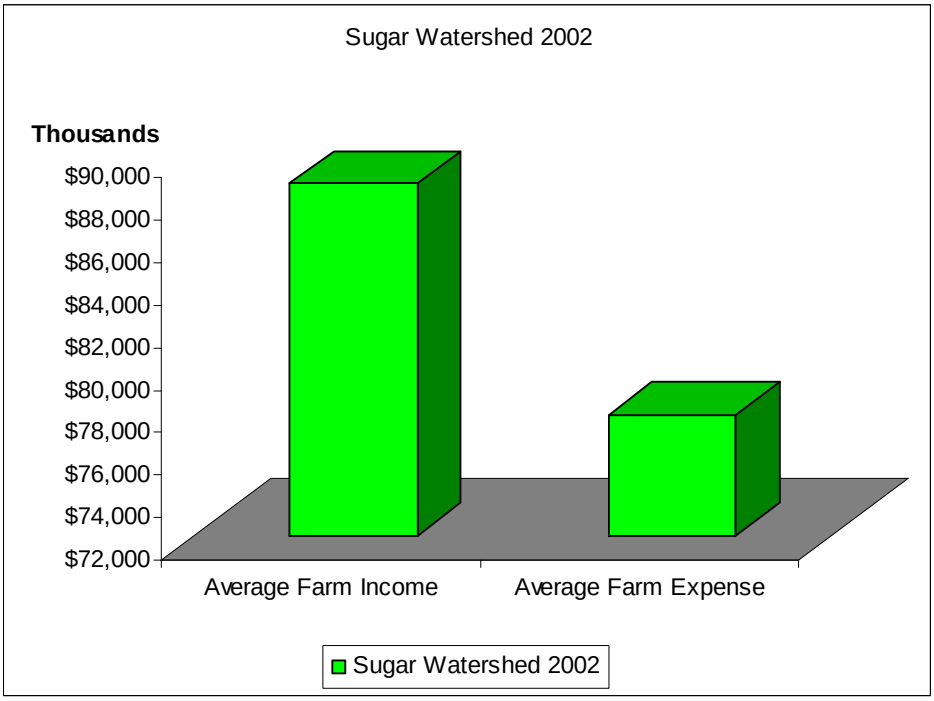
Performance Results System and Other Data

The producers within the watershed have implemented a variety of conservation practices over the past five years. Since 2002 through 2007 landowners have implemented over 30,700 acres of No-Till, approximately 53,000 feet of upland buffers, and just under 400 acres of aquatic buffers. Wildlife habitat has been improved or established on more than 8400 acres within the watershed and just less than 300 acres of forestry practices have been applied.



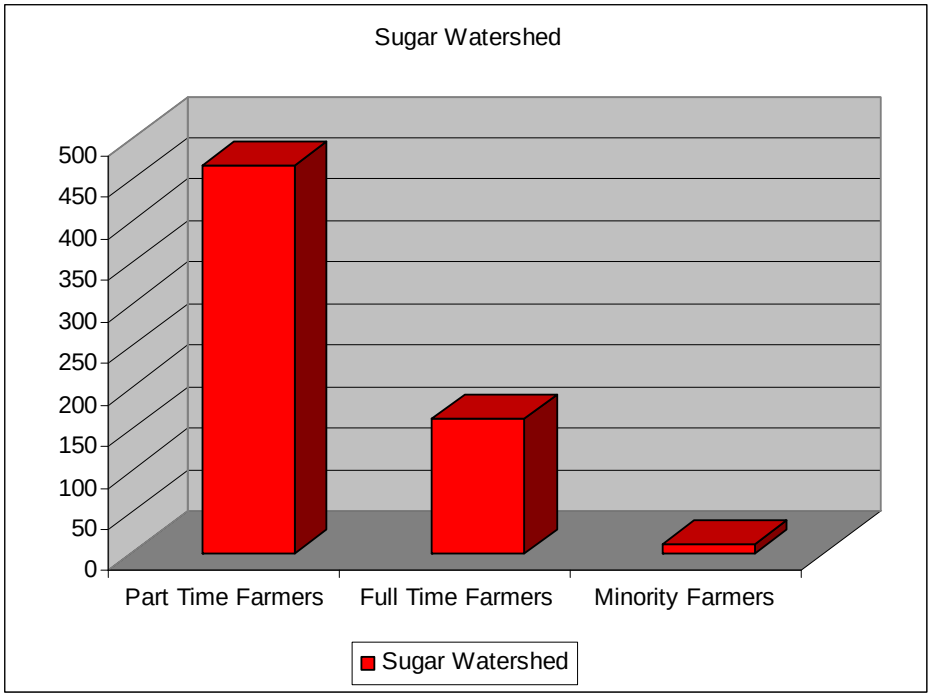
Census and Social Data (Relevant)

There are 1,112 farms in the watershed that average approximately 380 acres in size.



The 2002 average farm total income for all counties was $88,570,000 while average expense was $77,683,000.

There are approximately 466 part time farmers, 163 full time farmers and 11 minority farmers.



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Data Sources:

Indiana Common Resource Area (CRA) Map delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA.

Indiana Agricultural Statistics 2003 – 2004 - Indiana Agricultural Statistics, 1435 Win Hentshcel Blvd., Suite B105, West Lafayette

Major Land Resource Area Map Tool Indiana NRCS Soils Page - http://www.in.nrcs.usda.gov/mlra11/soils.html

Indiana Hydrologic Units - Indiana Geodata

Indiana Watershed Action Strategy Plan

Indiana Rapid Watershed Assessment (Electronic Data Sets – Web based application).

Indiana 2006 303d List – Indiana Department of Agriculture, Division of Natural Resources