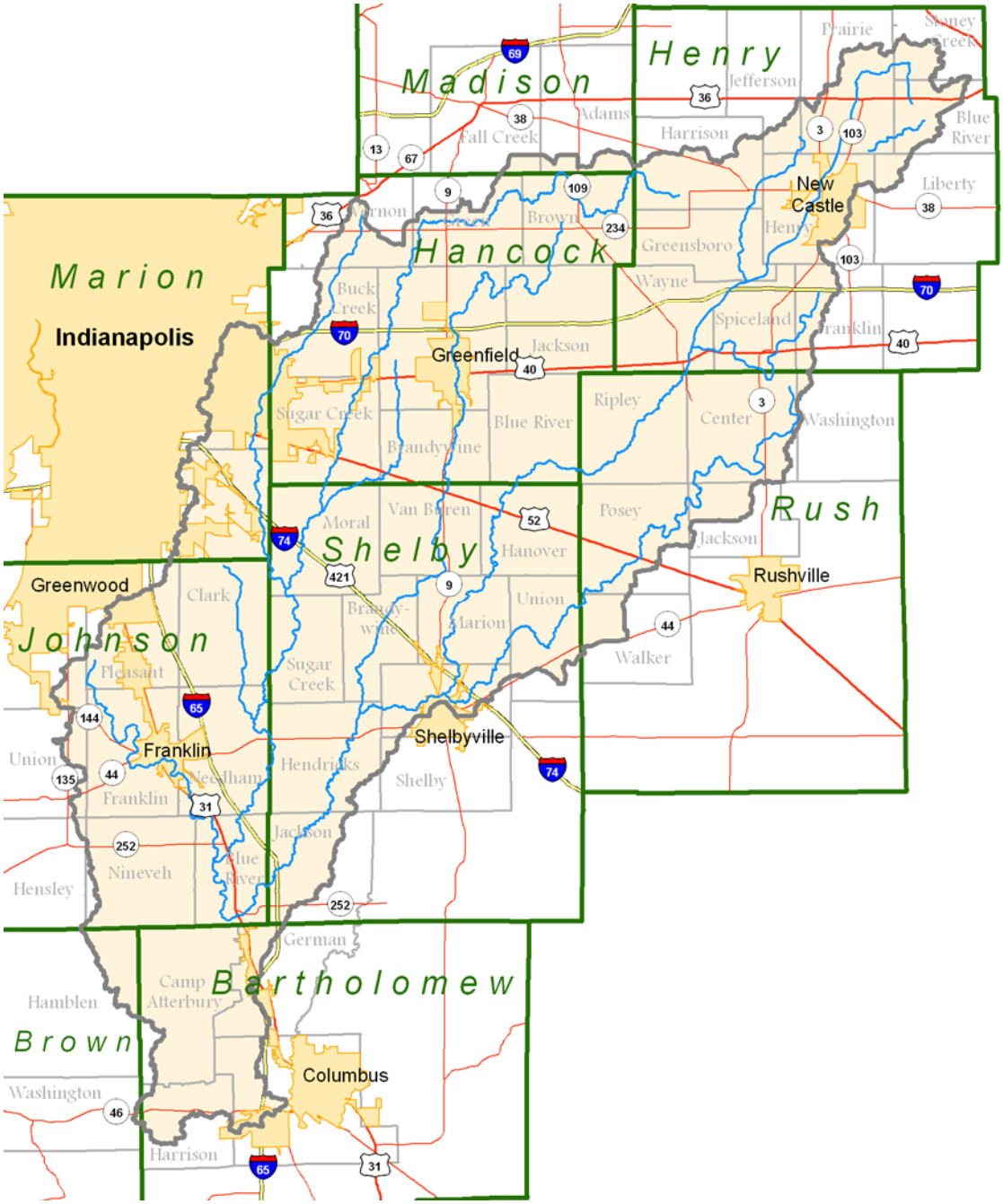
Rapid Watershed Assessment
Driftwood Watershed

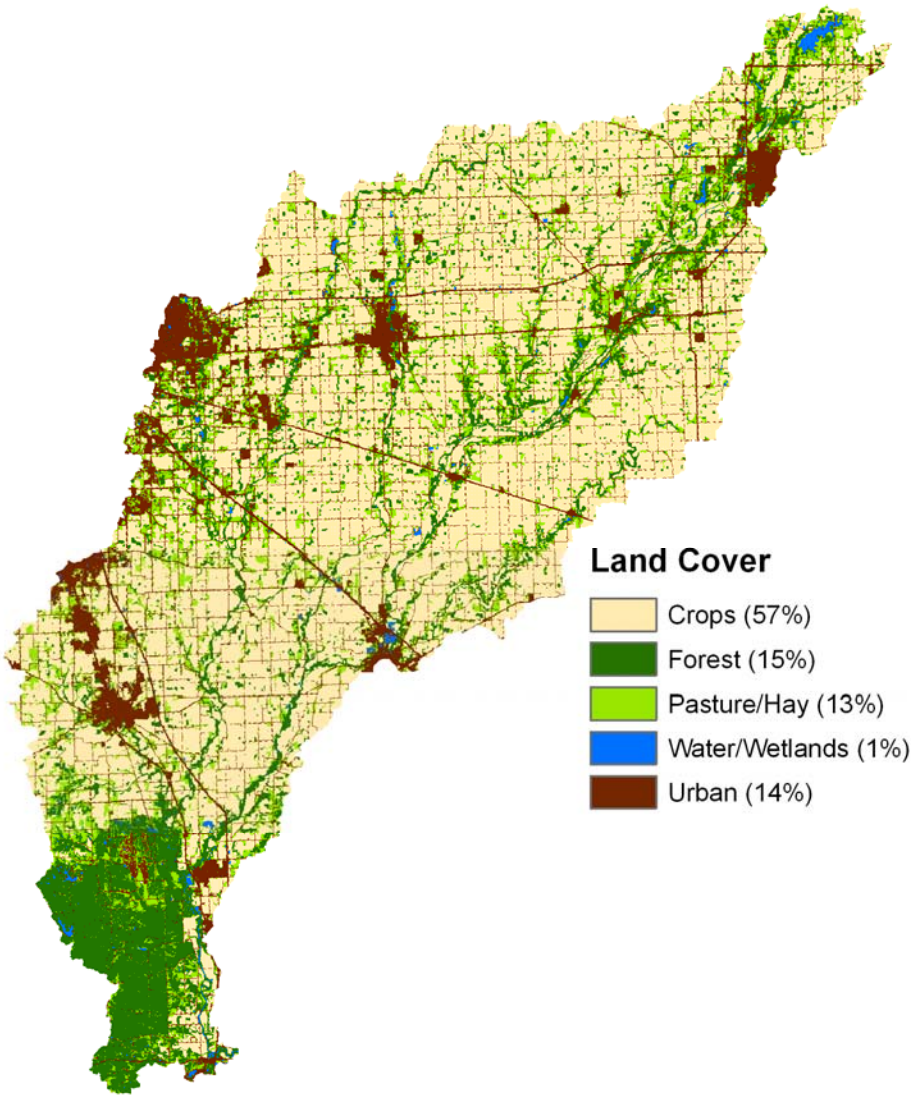
Rapid Watershed Assessments provide initial estimates of where conservation investments would best address the concerns of land owners, conservation districts, and community organizations and stakeholders. These assessments help land owners and local leaders set priorities and determine the best actions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

Driftwood Watershed



Introduction

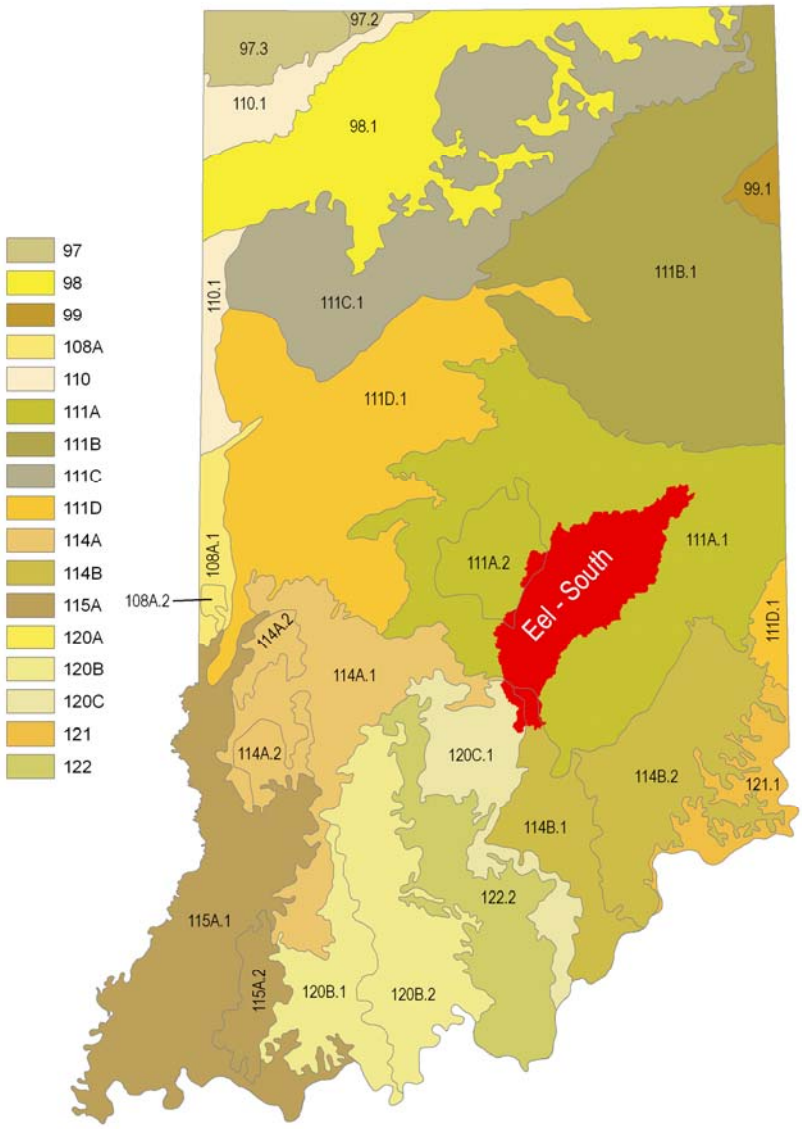
The Driftwood watershed is an eight digit (05120204) hydrologic unit code HUC) watershed located in the centeral part of Indiana. The watershed drainage area is just over 738,400 acres. The watershed covers nine different Indiana counties. It is subdivided into 46 subbasins represented on the map by 12 digit HUCs (Figure 2-1). The Big Blue River and Sugar Creek join just west of Edinburg, Indiana to form the Driftwood River. The Driftwood continues south, joining with the Flatrock, forming the East Fork of the White River.



Common Resource Area

There are three common resource areas in the watershed:

The Indiana and Ohio Till Plain, Northeaster 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.

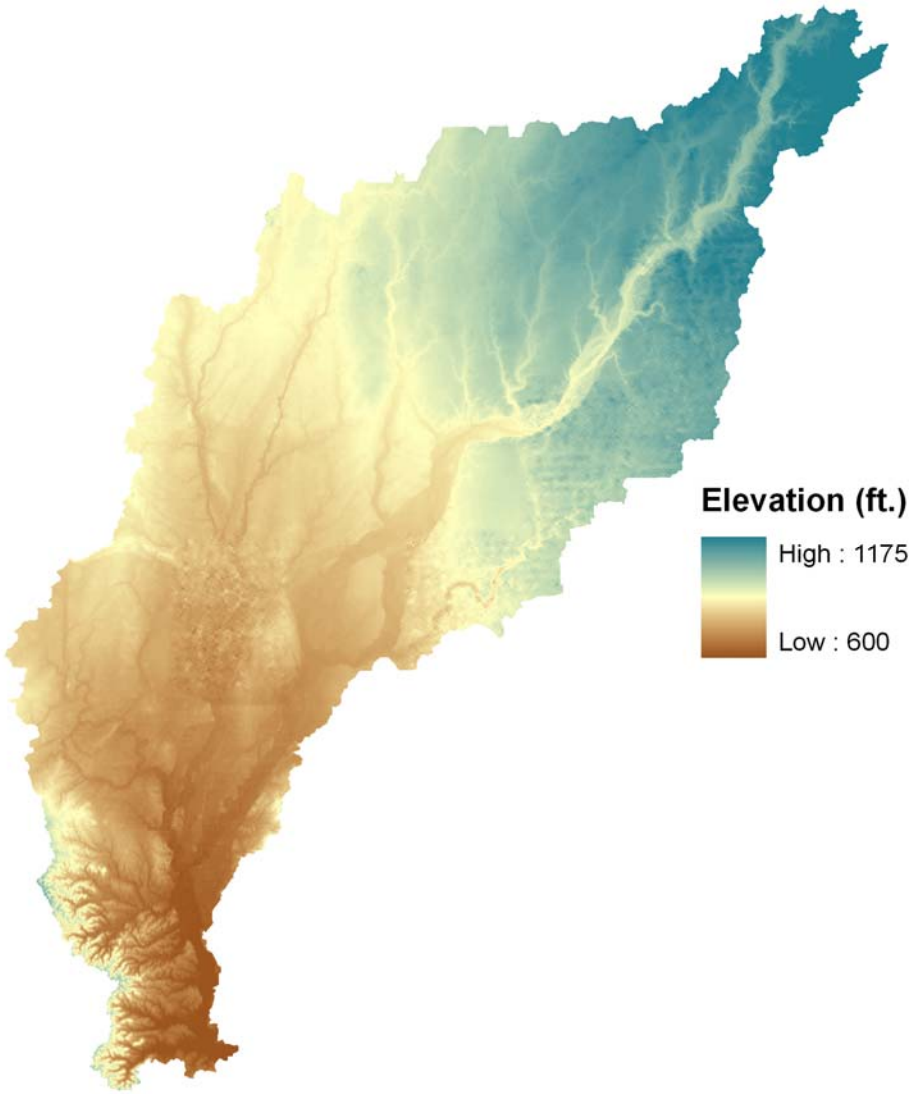


The East Corn Belt of Southern Illinois and Indiana Thin Loess and Till Plain, Western Part – (114B.1). Pre-Wisconsin till plain with a moderately thick mantle of loess in most places. It is influenced by karst topography. Corn, soybeans, livestock, and general farming are the main uses with some woodland and tobacco farms. Soils dominantly are poorly drained to well drained, formed in Illinoian Age till and overlain in many areas with a layer of loess.

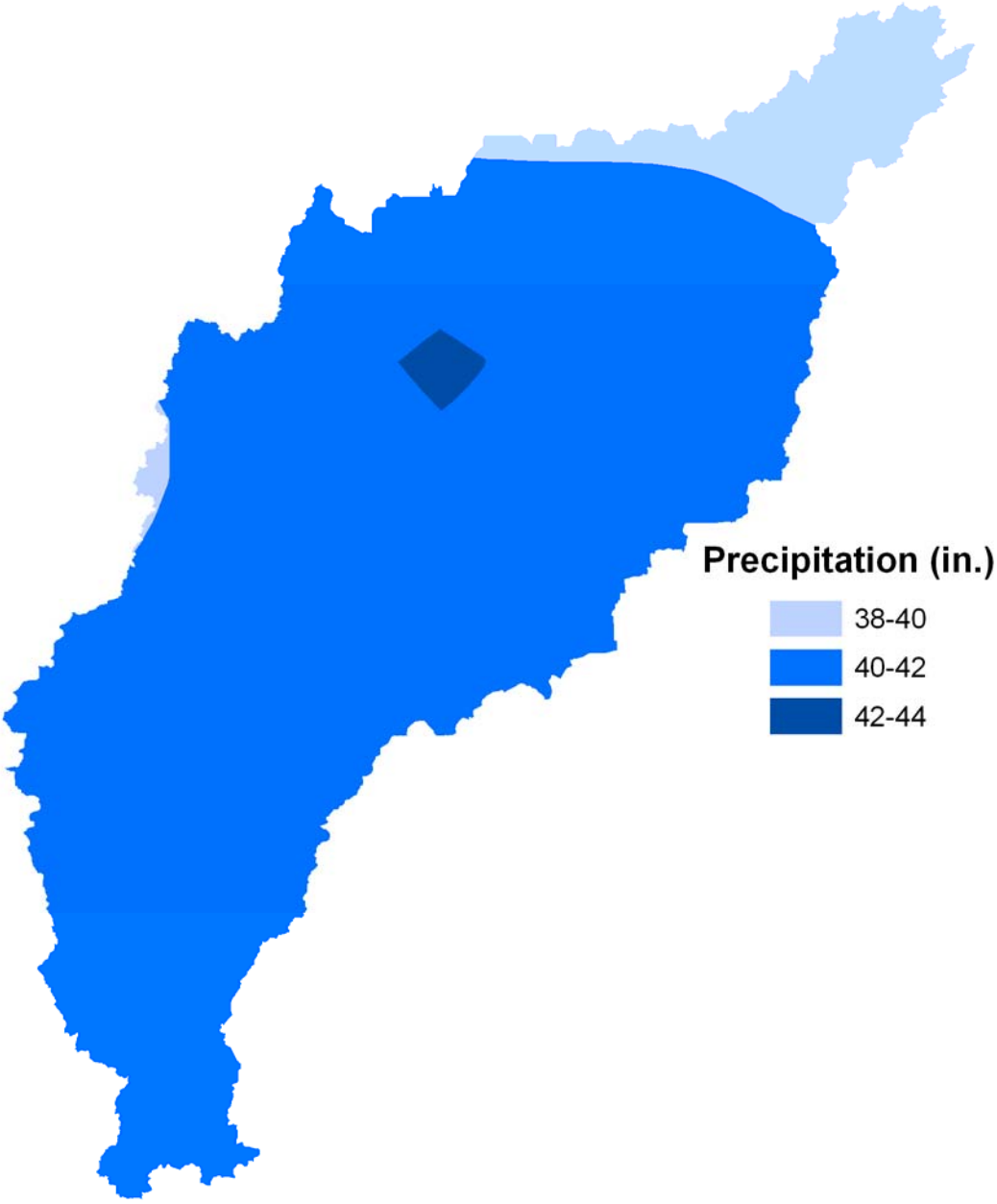
The Interior Plateau of Kentucky and Indiana Sandstone and Shale Hills and Valleys, Northeastern Part – (120C.1). Dissected, ;high hils, knobs, narrow valleys, and medium to high gradient streams. Oak-hickory forests are on the uplands and beech forests were found in the valleys. Chestnut oak has replaced American chestnut on the well-drained upland slopes. Virginia pine grows on the southern uplands. Soils are well drained to very poorly drained. Silty to clayey soils formed in loess and in siltstone, sandstone and shale residuum.

Physical Description

The Driftwood watershed is an eight digit (05120204) hydrologic unit code HUC) watershed located in the centeral part of Indiana. The watershed drainage area is just over 738,400 acres. The watershed covers nine different Indiana counties. It is subdivided into 46 subbasins represented on the map by 12 digit HUCs (Figure 2-1). The soils and climate favor agriculture.



This region produces corn, soybeans, and feed grains. The grains and hay grown in the region commonly are fed to beef cattle. Some specialty crops are grown near markets in the metropolitan areas. Much of the cropland near the larger cities is being subdivided and developed for urban uses.

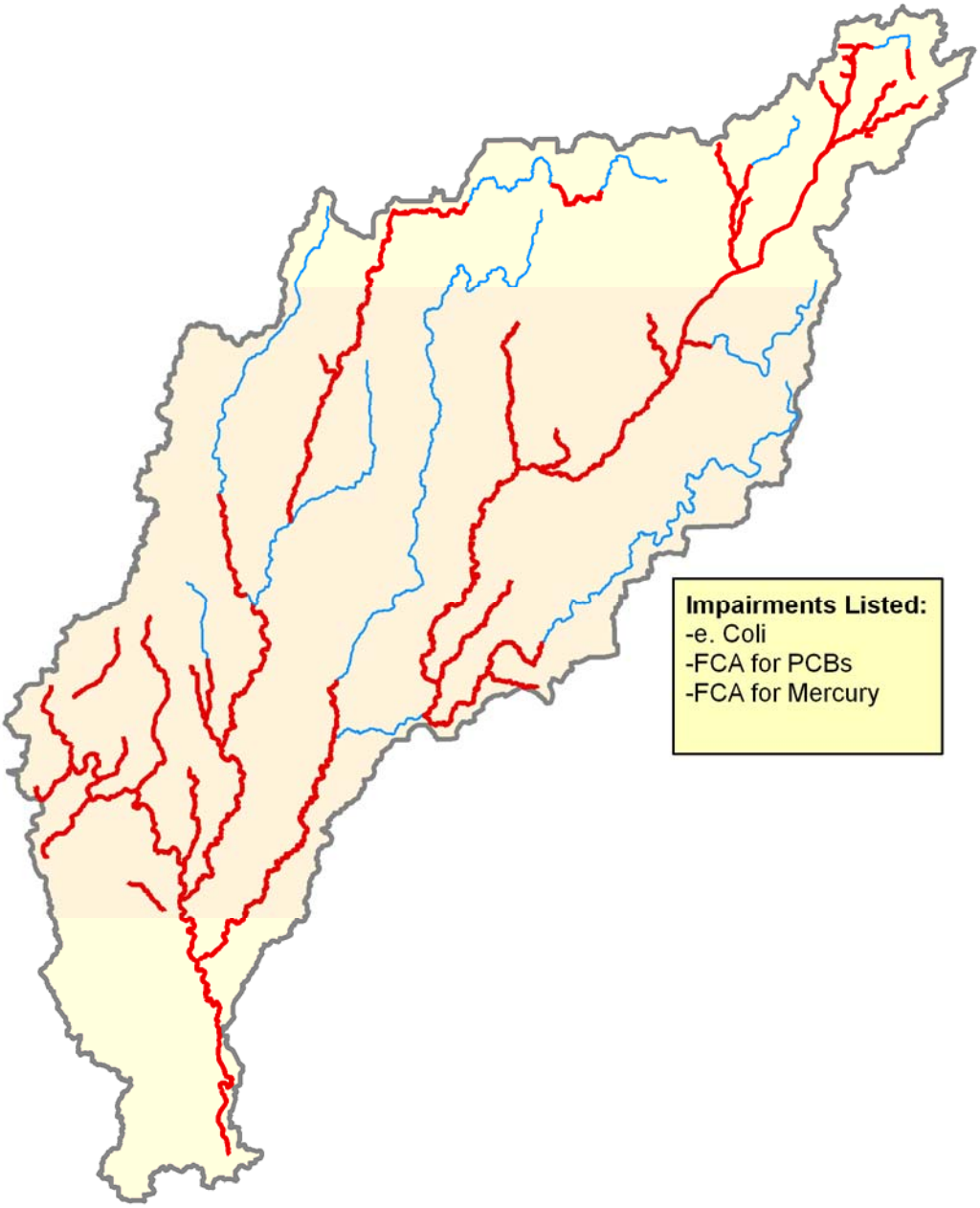


Assessment of waters

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 Driftwood Watershed.

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INW0411_T1001	BIG BLUE RIVER	E. COLI
INW0411_T1001	BIG BLUE RIVER	FCA for MERCURY
INW0412_T1002	BIG BLUE RIVER	E. COLI
INW0412_T1002	BIG BLUE RIVER	FCA for MERCURY
INW0413_00	LITTLE BLUE RIVER	E. COLI
INW0414_T1003	BIG BLUE RIVER	E. COLI
INW0414_T1003	BIG BLUE RIVER	FCA for MERCURY
INW0415_T1004	BIG BLUE RIVER	E. COLI
INW0415_T1004	BIG BLUE RIVER	FCA for MERCURY
INW0417_00	DUCK CREEK-DRY FORK	E. COLI
INW0418_T1005	BIG BLUE RIVER	E. COLI
INW0418_T1005	BIG BLUE RIVER	FCA for MERCURY
INW041B_00	MONTGOMERY CREEK	E. COLI
INW041B_T1006	BIG BLUE RIVER	E. COLI
INW041B_T1006	BIG BLUE RIVER	FCA for MERCURY
INW041C_T1007	BIG BLUE RIVER	E. COLI
INW041C_T1007	BIG BLUE RIVER	FCA for MERCURY
INW041D_T1008	BIG BLUE RIVER	E. COLI
INW041D_T1008	BIG BLUE RIVER	FCA for MERCURY
INW041E_T1009	BIG BLUE RIVER	E. COLI
INW041E_T1009	BIG BLUE RIVER	FCA for MERCURY
INW041E_T1009	BIG BLUE RIVER	FCA for PCBs
INW0423_T1010	BIG BLUE RIVER	FCA for PCBs
INW0441_T1021	BRANDYWINE CREEK	FCA for MERCURY
INW0442_T1022	BRANDYWINE CREEK	FCA for MERCURY
INW0443_T1023	BRANDYWINE CREEK	FCA for MERCURY
INW0445_T1024	BRANDYWINE CREEK	FCA for MERCURY
INW0446_T1025	BRANDYWINE CREEK	FCA for MERCURY
INW0461_T1029	SUGAR CREEK (DOWNSTREAM OF GRAIN DITCH)	E. COLI
INW0463_T1030	SUGAR CREEK	E. COLI
INW0464_T1003	KIRKHOFF DITCH	E. COLI
INW0464_T1031	SUGAR CREEK	E. COLI
INW0465_T1032	SUGAR CREEK SMITH-JOHNSON DITCH	E. COLI
INW0466_T1026	LITTLE SUGAR CREEK	FCA for MERCURY
INW0468_T1033	SUGAR CREEK-SUGAR CREEK (TOWN)	FCA for PCBs
INW0481_T1034	SUGAR CREEK-BROAD RIPPLE CAMP	E. COLI
INW0481_T1034	SUGAR CREEK-BROAD RIPPLE CAMP	FCA for PCBs
INW0485_T1035	SUGAR CREEK-NEEDHAM	E. COLI
INW0485_T1035	SUGAR CREEK-NEEDHAM	FCA for PCBs
INW0488_00	LITTLE SUGAR CREEK-CUTSINGER DITCH	E. COLI
INW0489_T1036	SUGAR CREEK	E. COLI
INW0489_T1036	SUGAR CREEK	FCA for PCBs

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INW048A_T1037	SUGAR CREEK	E. COLI
INW048A_T1037	SUGAR CREEK	FCA for PCBs
INW0498_00	HERRIOTTS CREEK (UPSTREAM OF PISGAH LAKE)	E. COLI
INW0498_T1038	SUGAR CREEK	E. COLI
INW0498_T1038	SUGAR CREEK	FCA for PCBs
INW04A6_M1046	DRIFTWOOD RIVER (NORTH OF CR 400N)	E. COLI



Soils

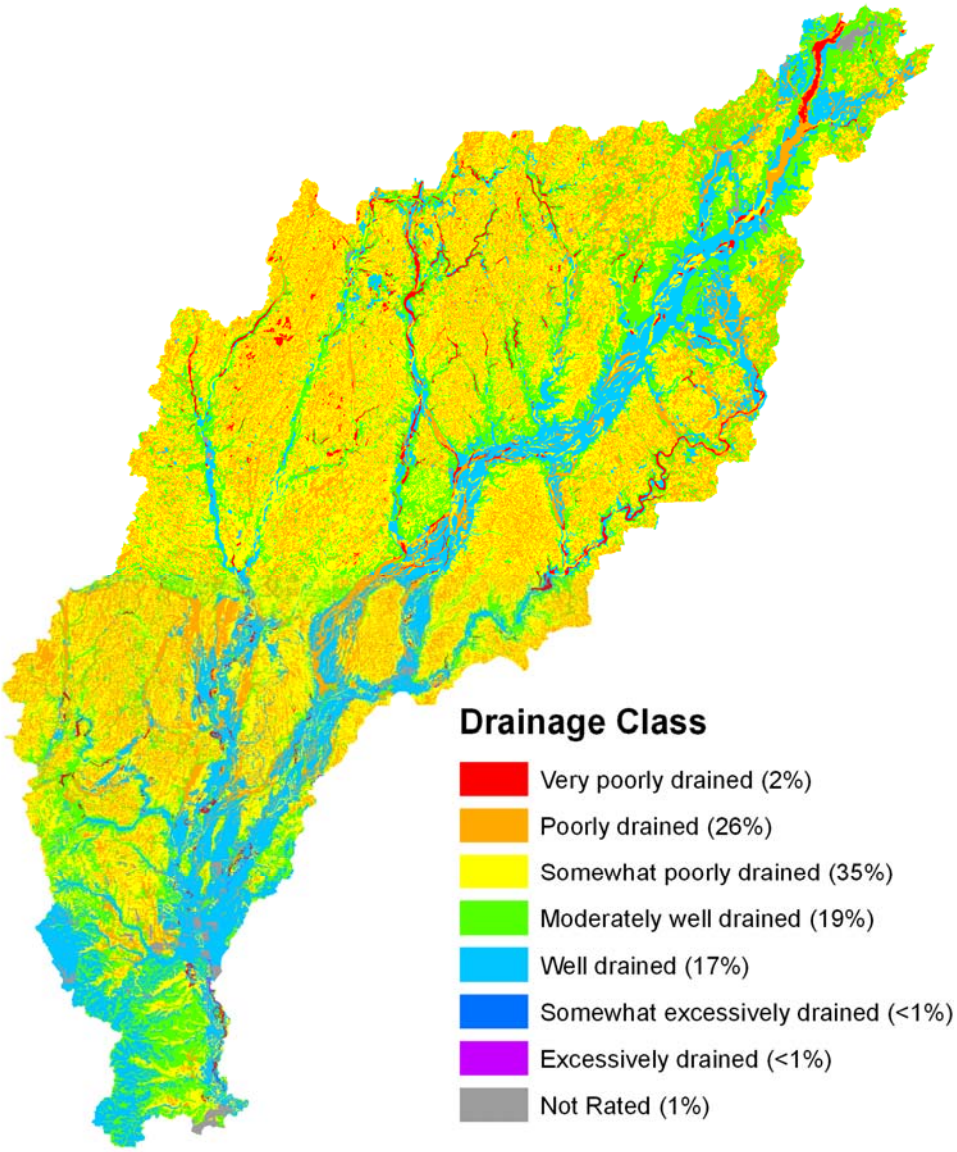
The dominant soil orders in MLRA (111A.1) are Alfisols, Inceptisols, and Mollisols. The MLRA also has small areas of Histosols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. They are very deep, generally are very poorly drained to somewhat poorly drained, and are loamy or clayey. The dominant kinds of parent material are till, outwash, and loess. Others include alluvium, glaciolacustrine sediments, residuum, and organic deposits. Hapludalfs (Cardington, Celina, Lewisburg, Losantville, Miami, Miamian, Milton, Russell, Strawn, Wawaka, Williamstown, and Xenia series) and Epiaqualfs (Crosby and Fincastle series) are on moraines. Some Argiaquolls (Brookston, Cyclone, Kokomo, and Treaty series) are in depressions on ground moraines. Other Argiaquolls (Lippincott and Westland series) and Endoaquolls (Patton and Pella series) are in depressions on outwash plains and terraces. Hapludalfs (Eldean, Fox, Martinsville, and Ockley series) and Endoaqualfs (Sleeth and Whitaker series) are on terraces and outwash plains. Haplosaprists (Linwood and Palms series) and Humaquepts (Martisco series) are in deep depressions or potholes. Eutrudepts (Eel and Genesee series), Hapludolls (Ross series), Endoaquepts (Shoals series), and Endoaquolls (Sloan series) are on flood plains.

The dominant soil orders in MLRA (114B.1) are Alfisols and Inceptisols. The MLRA also has small areas of Mollisols, Ultisols, and Entisols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. Most are medium textured or fine textured. Somewhat poorly drained or poorly drained Albaqualfs (Cowden and Marine series), Endoaqualfs (Iva and Oconee series), Epiaqualfs (Hoosierville series), Glossaqualfs (Vigo series), and Argiudolls (Herrick series) are on broad, loess-covered till plains. Moderately well drained, gently sloping to strongly sloping Fragiudalfs are on side slopes on loess-covered till plains (Ava, Cincinnati, Hosmer, and Shakamak series) and on side slopes that are underlain by bedrock residuum (Grantsburg series). Somewhat poorly drained and moderately well drained, gently sloping to strongly sloping Hapludalfs (Blair, Bunkum, Fishhook, and Homen series) and Epiaqualfs (Atlas series) are on side slopes that are underlain by paleosols or pedisediments. Well drained, strongly sloping to very steep Hapludalfs (Hickory series) are on side slopes on till plains. Well drained Paleudalfs (Negley series), Hapludults (Chetwynd series), and Hapludalfs (Parke and Pike series) formed in outwash deposits on high stream terraces, kames, and moraines. Moderately well drained Fragiudalfs (Otwell and Haubstadt series) and somewhat poorly drained Fragiaqualfs (Dubois series) formed in a thin layer of loess and in the underlying weathered outwash, lacustrine sediments, or old alluvium. They are on high stream terraces and lake plains. Somewhat poorly drained to well drained, nearly level to strongly sloping Epiaqualfs (Hurst and McGary series) and Hapludalfs (Colp, Shircliff, and Markland series) formed in lacustrine sediments on lacustrine terraces and lake plains. Well drained to poorly drained Eutrudepts (Haymond and Wilbur series), Endoaquepts (Belknap, Piopolis, and Stendal series), and Fluvaquents (Birds, Bonnie, and Wakeland series) formed in alluvium on flood plains. Udorthents (Bethesda, Fairpoint, and Morristown series) and Udarents (Lenzburg, Minnehaha, Schuline, and Swanwick series) formed in regolith from surface-mining operations.

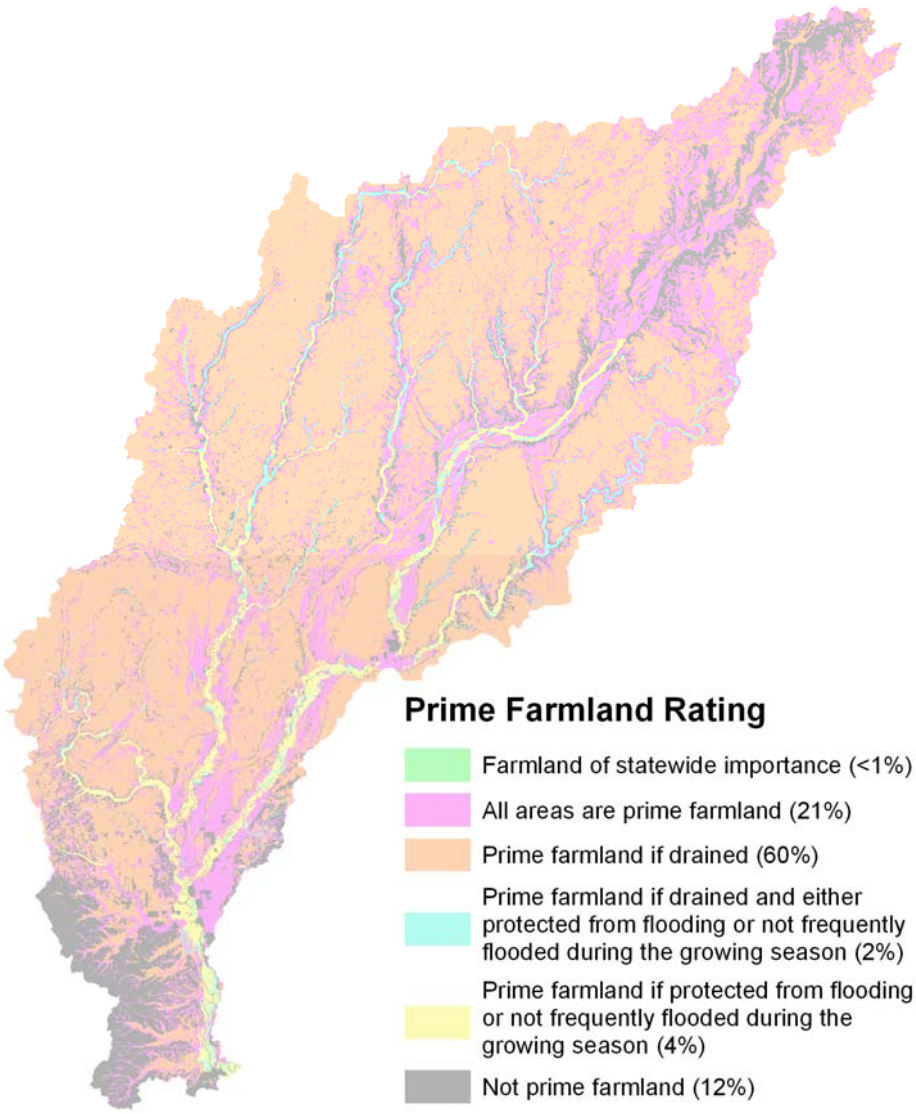
The dominant soil orders in MLRA (120C.1) are Alfisols, Ultisols, and Inceptisols. The soils in the area have a mesic soil temperature regime, a udic or aquic soil moisture regime, and dominantly mixed mineralogy. They formed dominantly in loess and in residuum derived from siltstone and shale. They range from moderately deep to very deep and from somewhat poorly drained to well drained and are loamy, silty, or clayey. Fragiudults (Spickert and Tilsit series) and Hapludults (Wrays series) are the dominant soils on ridgetops and the upper parts of hills and knobs. Halpudalfs (Kurtz series), Hapludults (Gilwood and Gnawbone series), and Dystrudepts (Brownstown series) are on moderately sloping to very steep side slopes. Hapludalfs (Coolville, Rarden, Stonehead, and Wellrock series) are on the gently sloping to moderately steep lower parts of side slopes. Hapludalfs (Elkinsville series), Fragiudalfs (Pekin series), and Fragiaqualfs (Bartle series) are on stream terraces. Dystrudepts (Beanblossom, Cuba, and Steff series) and Endoaquepts (Stendal 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."



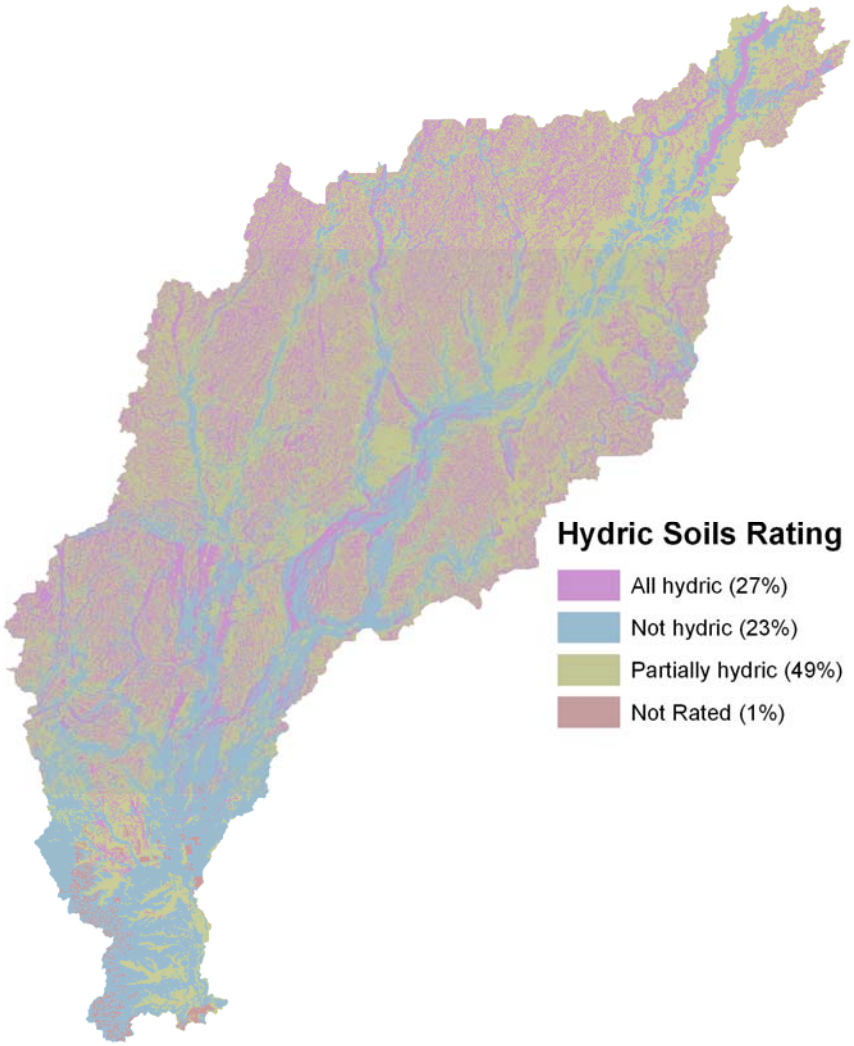
Farmland Classification Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and 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.

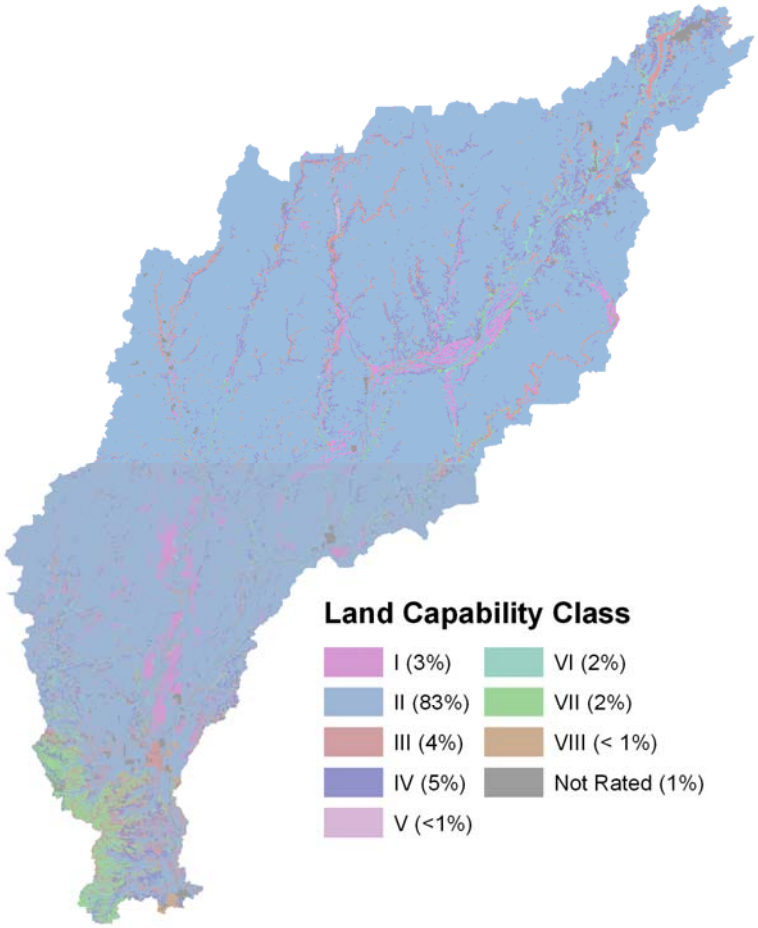
Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register 1994). These soils, under natural conditions,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

If soils are wet enough 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 hydirc soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 2002).



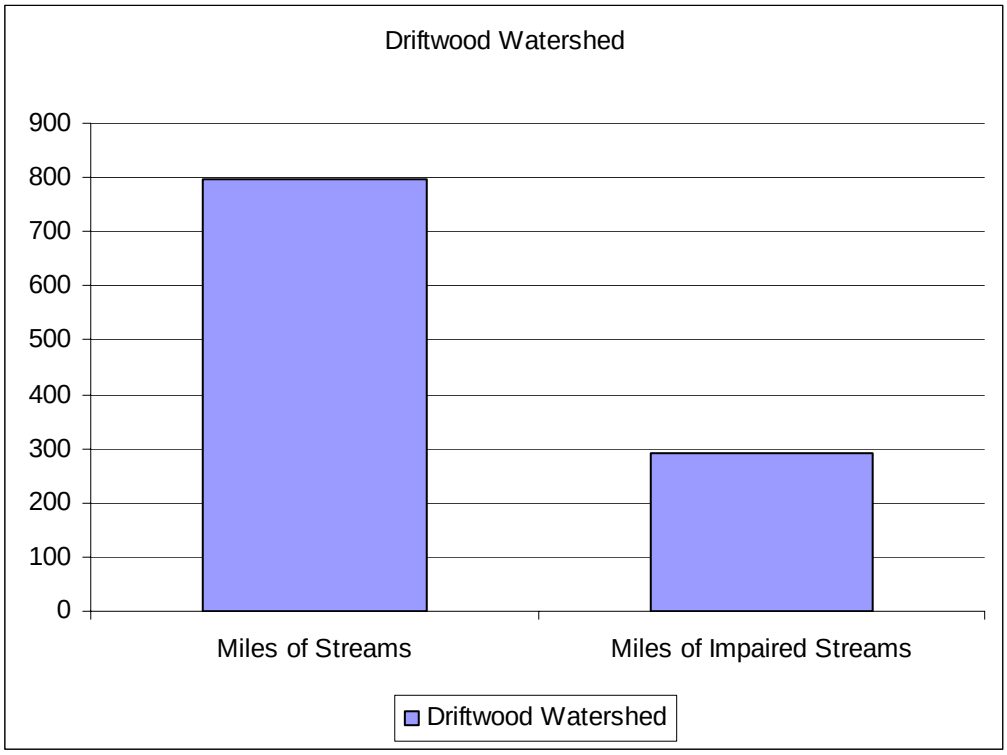
Highly Erodible Land (HEL)
A soil map unit with an erodibility index (EI) of 8 or greater is considered to be highly erodible land (HEL). The EI for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil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

Land Capability Classification
Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive 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.



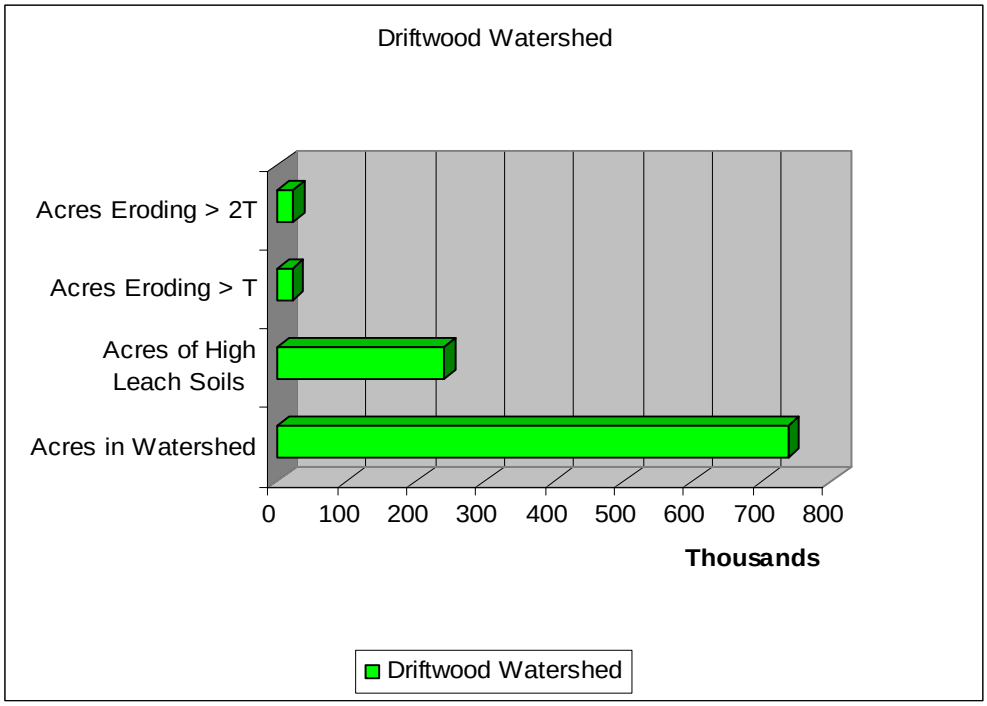
Resource Concerns
Stakeholders and electronic analysis have been identified the following resource concerns as being the top priority:

- Surface Water Quality – There is approximately 30 percent or 293 miles of the 794 total miles of the streams within the watershed that have identified impairments. Excessive amounts of sediments, nutrients, and bacteria degrade the water quality causing an unbalanced fish community with depressed populations and limited diversity.



- Ground Water Quality - The watershed has in excess of 242,400 acres of soils with high leaching index (> 10) which allows containments 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.

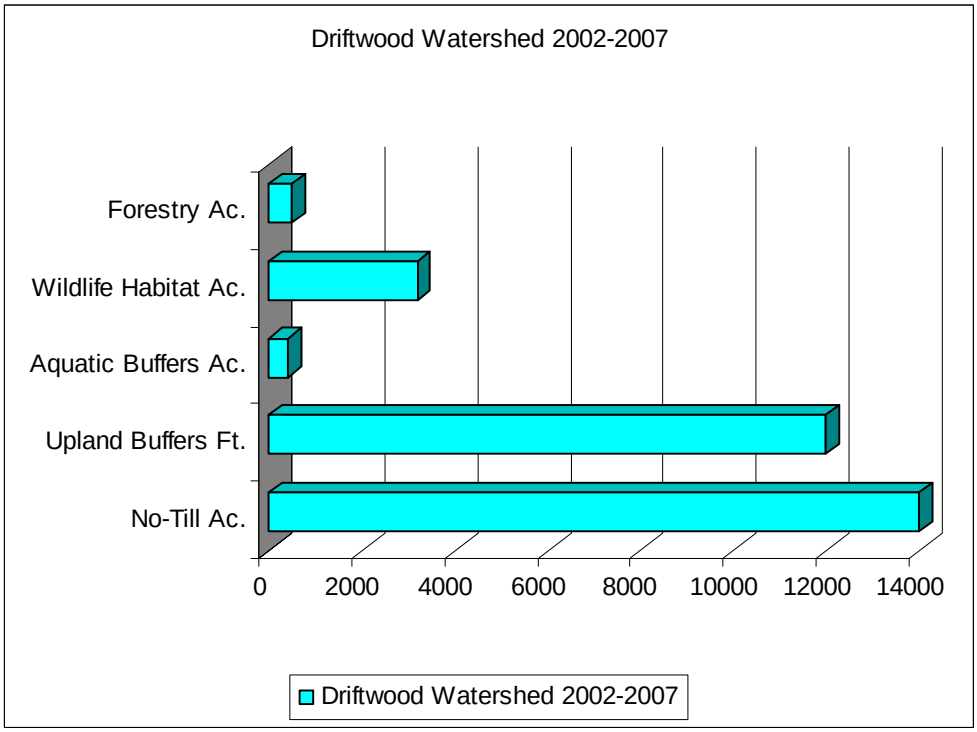
- Air Quality – 66.5 percent of the watershed has been identified by the Environmental Protection Agency as have an air quality concern.
- Threatened & Endangered Species – Just over 16 percent of the 738,400 acres in the watershed lie within the range of know Threatened and Endangered Species.



- Soil Quality – The watershed has over 47,300 acres of soils subject to soil erosion. There is over 22,000 acres eroding at twice the tolerable level or "T". This represents just over 6 percent of the watershed.

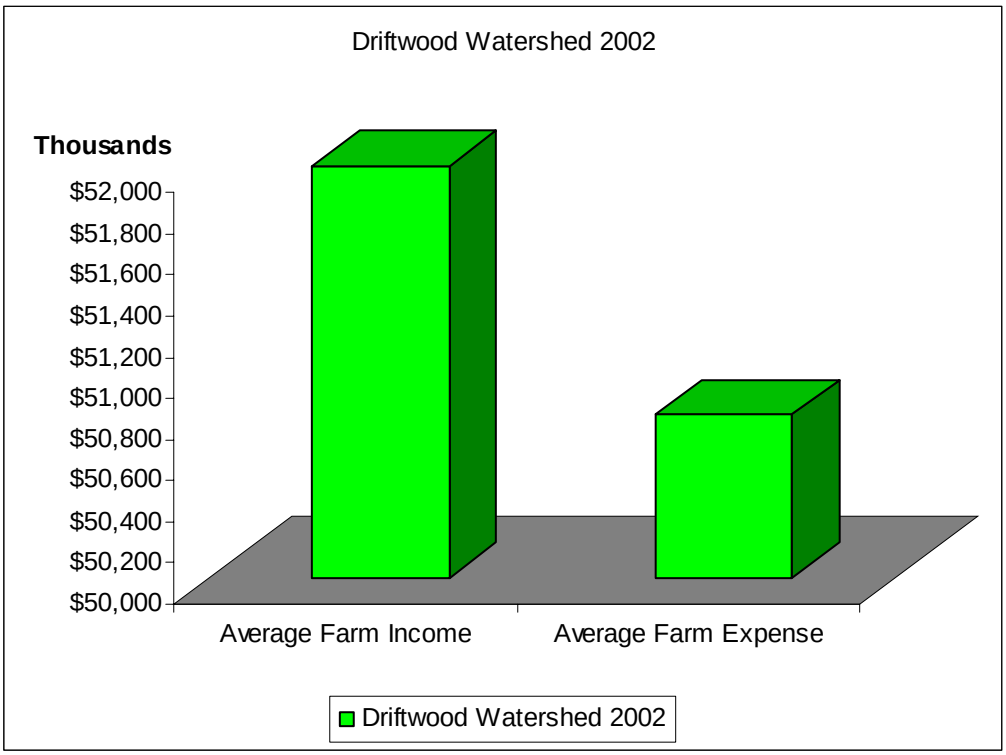
Performance Results System and Other Data

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 14,000 acres of No-Till, approximately 12,000 feet of upland buffers, and just over 400 acres of aquatic buffers. Wildlife habitat has been improved or established on more than 3200 acres within the watershed and just over than 500 acres of forestry practices have been applied.

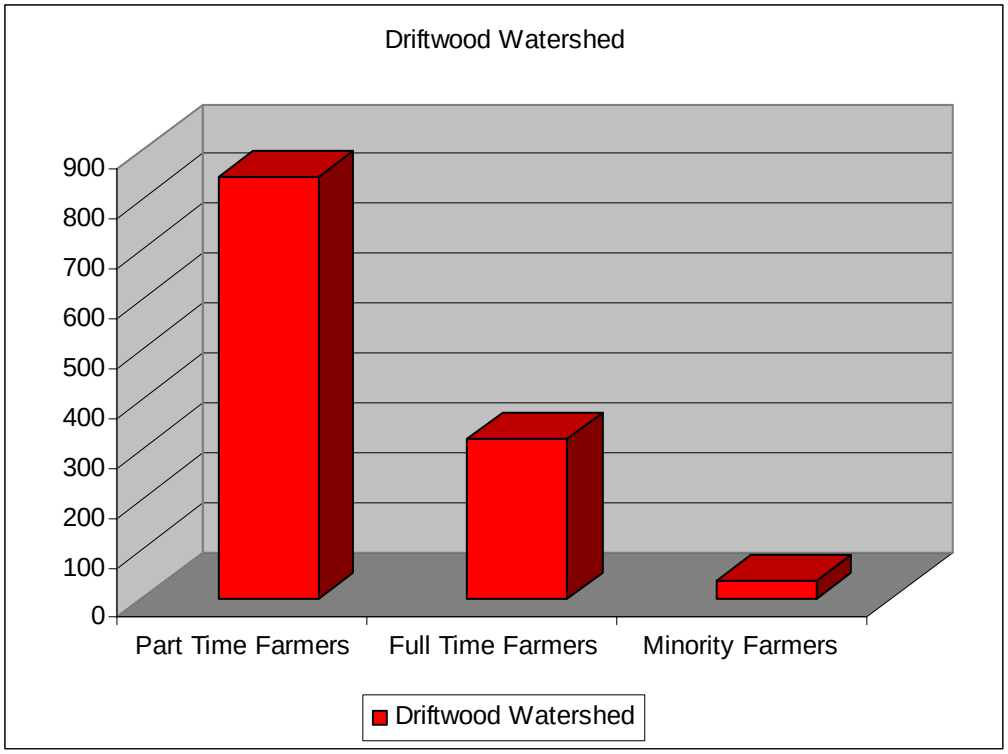


Census and Social Data (Relevant)

There are approximately 5156 farms in the watershed that average approximately 237 acres in size.



The 2002 average farm total income for all the counties was $52,000,000 while average expense was $50,790,000.



There are approximately 843 part time farmers, 320 full time farmers and 34 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

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