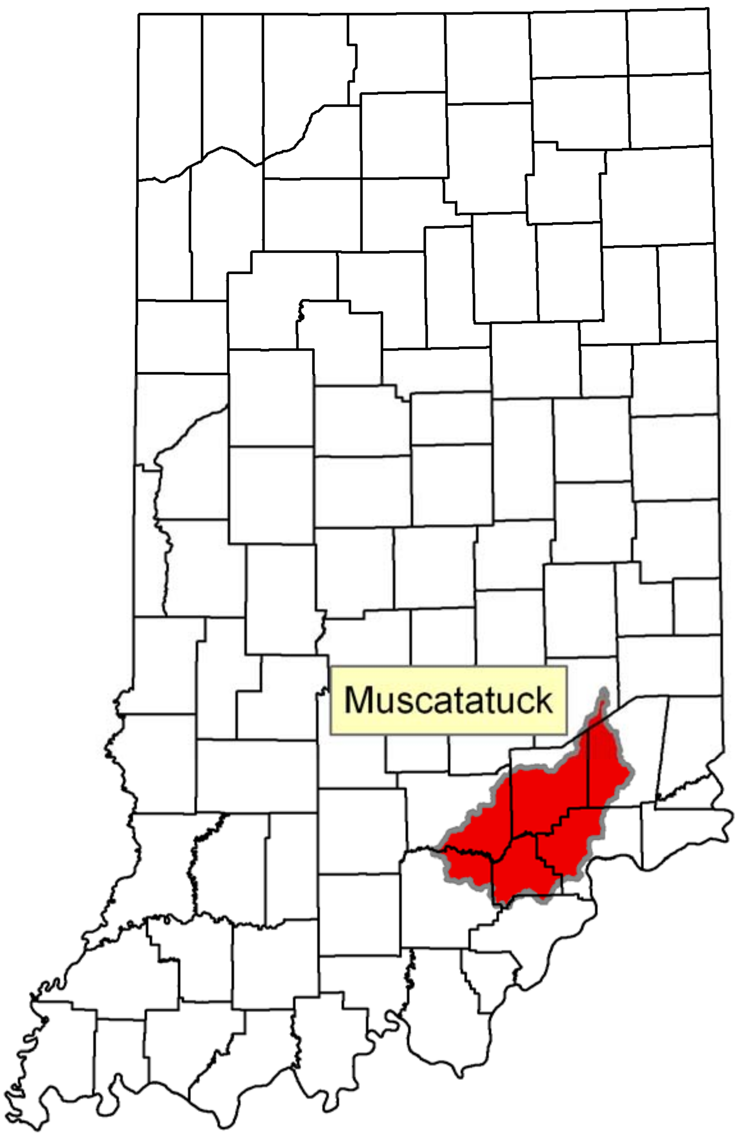
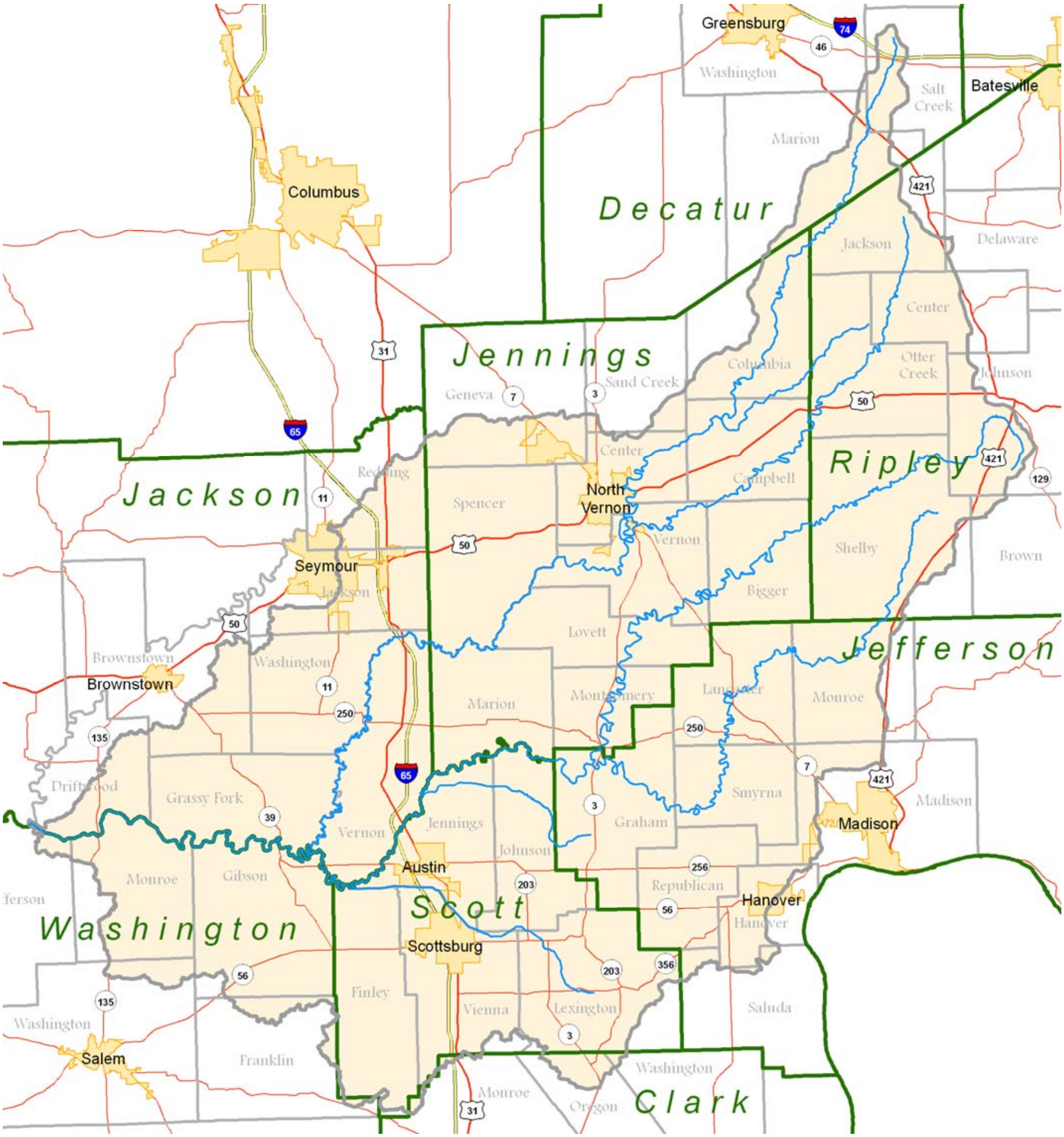
Rapid Watershed Assessment
Muscatatuck Watershed



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.

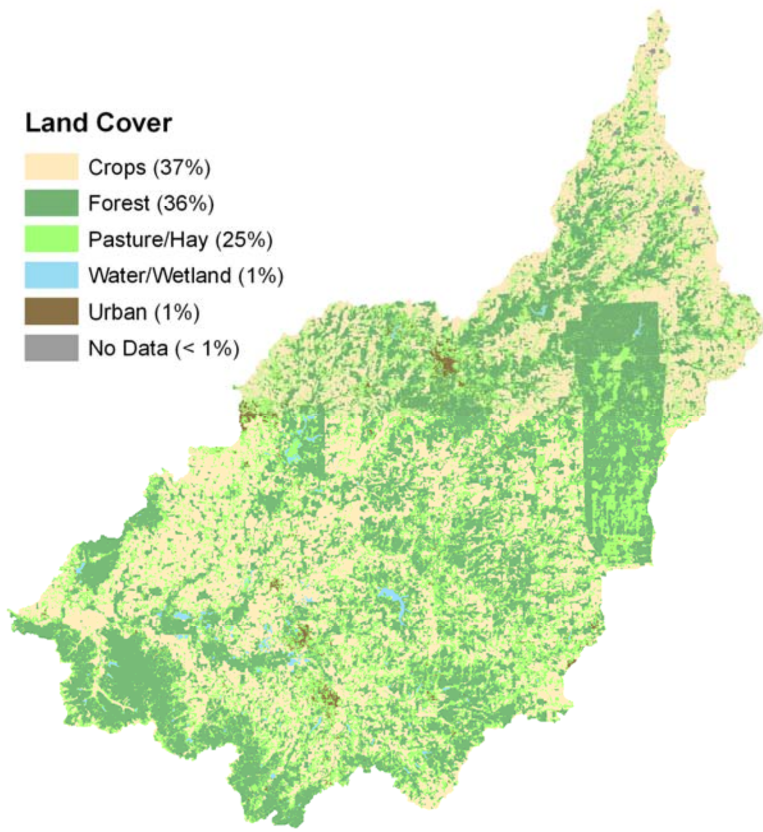
Muscatatuck Watershed



Introduction

The Muscatatuck watershed is an eight digit (05120207) hydrologic unit code HUC) watershed in the upper Southeast corner of Indiana. The watershed drainage area is just over 731,300 acres. The watershed covers eight different Indiana counties. It is subdivided into 41 subbasins represented on the map by 12 digit HUCs (Figure 2-1).

The Muscatatuck River forms at the confluence of Big Creek and Graham Creek near Paris Crossing, Indiana, before flowing to the west for approximately 40 miles and discharging into the East Fork White River near Medora, Indiana. The primary waterbodies are the Muscatatuck River, Hardy Lake State Recreation Area, and the Muscatatuck National Wildlife Refuge along with State Forests. The landscape changes from steeply rolling uplands to gently rolling lowlands.

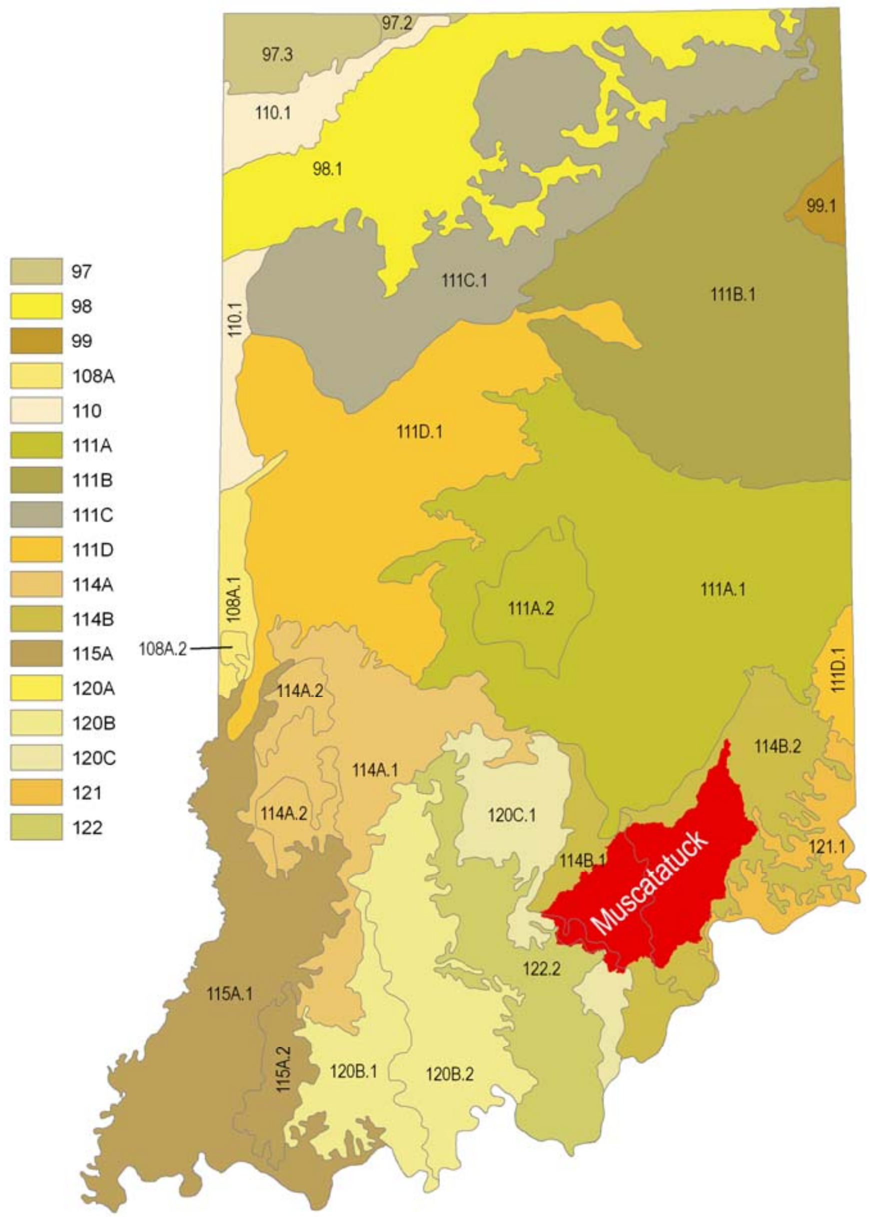


Common Resource Area

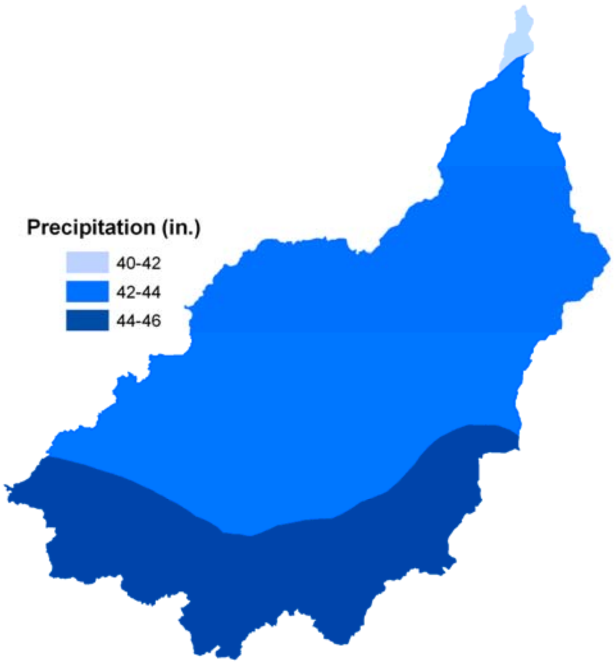
There are two common resource areas in the watershed:

The East Corn Belt of Southern Illinois and Indiana Thin Loess and Till Plain, Western Part (114B.1) – A Pre-Wisconsin drift plain. Widespread areas of nearly flat, deeply leached acidic, pre-Wisconsin till and thin loess. Some dissected areas. Beech forest and elm-ash swamp forest were dominant. Soybeans are common and are well adapted to spring soil wetness. Corn and livestock farming also occur. Soils are very poorly drained to well drained, formed in Illinois age till.

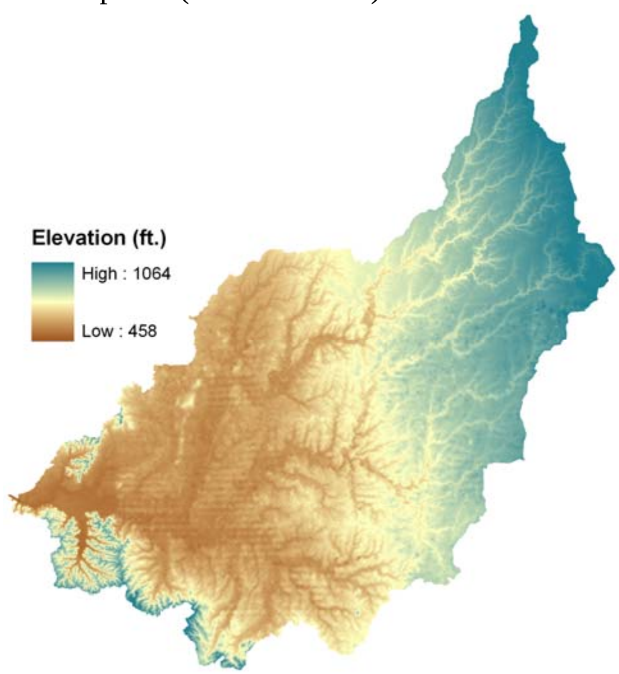
The Mined subsection – East Corn Belt of Southern Illinois and Indiana Thin Loess and Till Plain, Western Part (114B.2). A pre-Wisconsin drift and till plain. Widespread areas of nearly flat, deeply leached acidic, pre-Wisconsin till and thin loess. Some dissected areas. Mining operations, permanent pasture and man-made lakes are dominant. Woodland largely confined to older mining areas. Compaction and erosion are concerns. Some corn and livestock farming occur. Soils are very poorly drained to well drained, mined soils formed in Illinois age till may be the un-reclaimed or reclaimed.



Physical Description

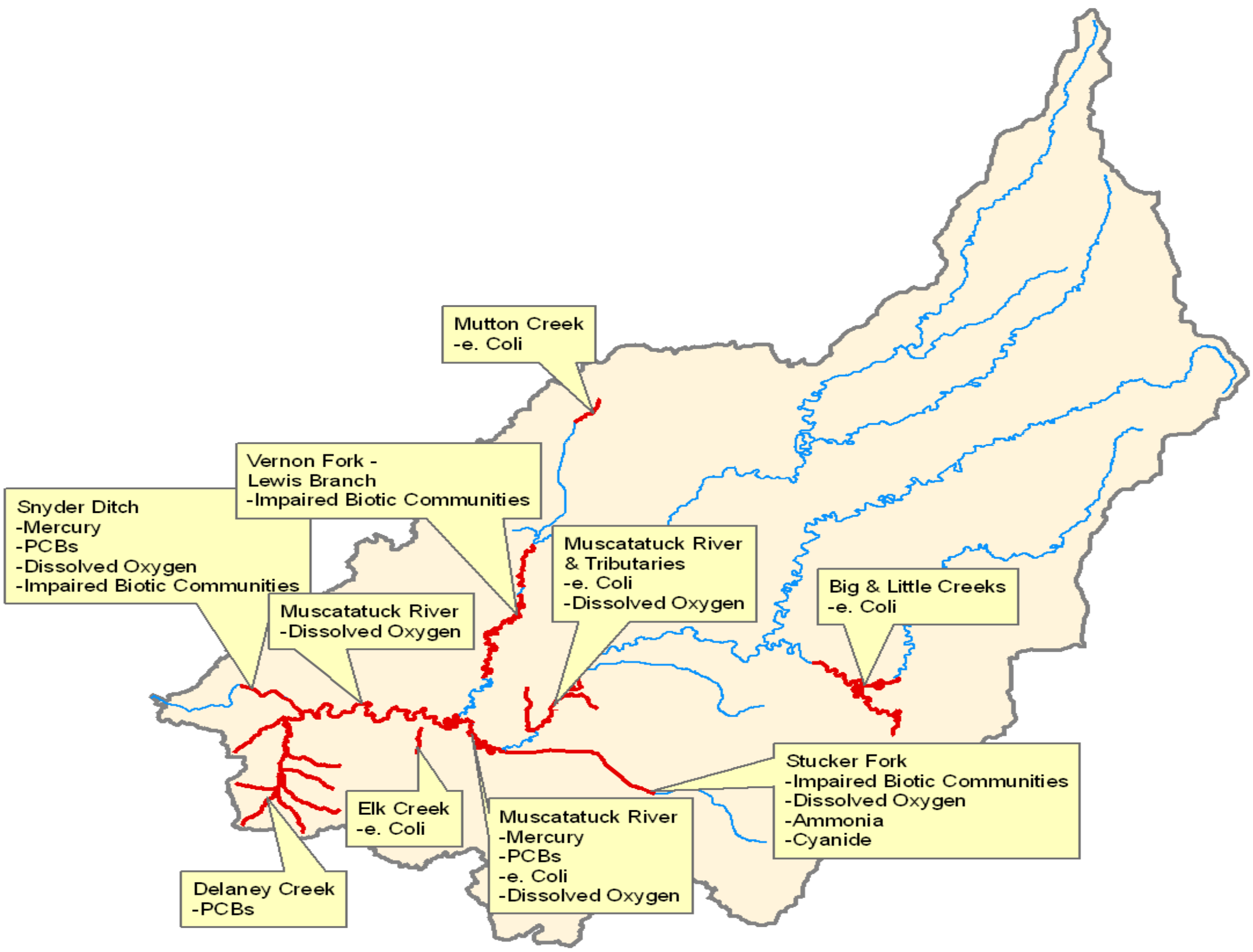


The Muscatatuck River watershed is located in southeastern Indiana. The watershed encompasses approximately 1142 square miles in eight different counties and approximately 856 miles of perennial streams (USEPA 2002a). It is subdivided into 41 subbasins represented on the map by 14 digit HUCs. Approximately one-third of the watershed is classified as forested and over half is agricultural. The majority of the soils in the watershed have medium to high erosion potential. The Muscatatuck River forms at the confluence of Big Creek and Graham Creek near Paris Crossing, Indiana, before flowing to the west for approximately 40 miles and discharging into the East Fork White River near Medora, Indiana. The entire Muscatatuck 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 (US EPA 1999).



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 Muscatatuck Watershed.



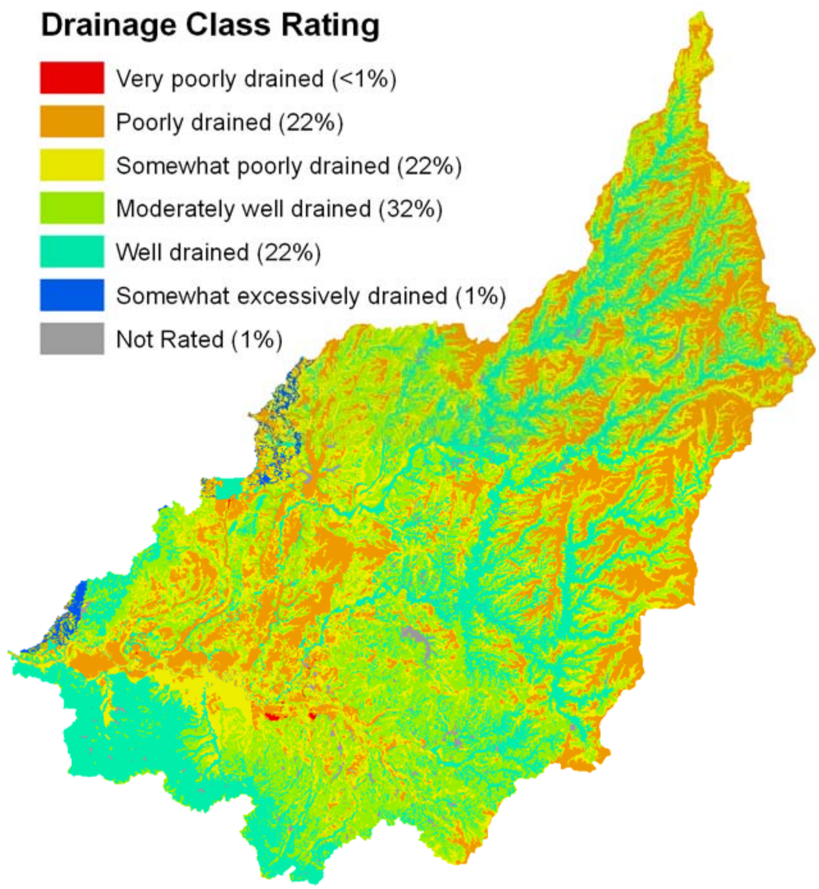
WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INW0716_00	BIG CREEK-HARBERTS CREEK	E. COLI
INW0719_00	LITTLE CREEK	E. COLI
INW071A_00	BIG CREEK (UPSTREAM OF WALTON CREEK)	E. COLI
INW0737_00	AUSTIN AND OTHER TRIBUTARYS	E. COLI
INW0737_T1008	MUSCATATUCK RIVER	E. COLI
INW0737_T1009	MUSCATATUCK RIVER	DISSOLVED OXYGEN
INW0737_T1009	MUSCATATUCK RIVER	E. COLI
INW074D_00	STUCKER FORK(W L MCCLAIN DITCH)	AMMONIA
INW074D_00	STUCKER FORK(W L MCCLAIN DITCH)	CYANIDE
INW074D_00	STUCKER FORK(W L MCCLAIN DITCH)	DISSOLVED OXYGEN
INW074D_00	STUCKER FORK(W L MCCLAIN DITCH)	IMPAIRED BIOTIC COMMUNITIES
INW0753_00	NORTH FORK-HONEY CREEK/SQUARE RUN	FCA for MERCURY
INW0754_00	NORTH FORK-FLATROCK/WOLF CREEKS	FCA for MERCURY
INW0755_00	NORTH FORK-SUGAR/LEATHERWOOD CREEK	FCA for MERCURY
INW0756_00	NORTH FORK-FINCH BRANCH	FCA for MERCURY
INW0758_00	NORTH FORK-PLEASANT RUN/LONG BRANCH	FCA for MERCURY
INW0758_T1010	VERNON FORK, NORTH FORK WATER INTAKE	FCA for MERCURY
INW0759_00	NORTH FORK-DEER CREEK	FCA for MERCURY
INW0759_T1011	VERNON FORK, NORTH FORK WATER INTAKE	FCA for MERCURY
INW0781_01	MUTTON CREEK (DOWNSTREAM OF LITTLE MUTTON CREEK)	E. COLI
INW0791_00	VERNON FORK-LEWIS BRANCH	IMPAIRED BIOTIC COMMUNITIES
INW0796_T1002	MUSCATATUCK RIVER (UPSTREAM OF VERNON FORK)	DISSOLVED OXYGEN
INW0796_T1002	MUSCATATUCK RIVER (UPSTREAM OF VERNON FORK)	E. COLI
INW0796_T1002	MUSCATATUCK RIVER	FCA for MERCURY
INW0796_T1002	MUSCATATUCK RIVER	FCA for PCBs
INW0796_T1003	MUSCATATCUK RIVER (DOWNSTREAM OF VERNON FORK)	DISSOLVED OXYGEN
INW07A6_01	ELK CREEK (DOWNSTREAM OF ARNOLD CREEK)	E. COLI
INW07B1_M1003	MUCATATUCK RIVER	DISSOLVED OXYGEN
INW07B1_M1003	MUCATATUCK RIVER	FCA for MERCURY
INW07B1_M1003	MUCATATUCK RIVER	FCA for PCBs
INW07B1_M1003	MUCATATUCK RIVER	IMPAIRED BIOTIC COMMUNITIES
INW07B4_00	DELANY CREEK	E. COLI
INW07B5_M1004	MUSCATATUCK RIVER-SNYDER DITCH	DISSOLVED OXYGEN
INW07B5_M1004	MUSCATATUCK RIVER-SNYDER DITCH	FCA for MERCURY
INW07B5_M1004	MUSCATATUCK RIVER-SNYDER DITCH	FCA for PCBs
INW07B5_M1004	MUSCATATUCK RIVER-SNYDER DITCH	IMPAIRED BIOTIC COMMUNITIES
INW07B7_M1005	MUSCATATUCK RIVER	FCA for MERCURY
INW07B7_M1005	MUSCATATUCK RIVER	FCA for PCBs

Soils

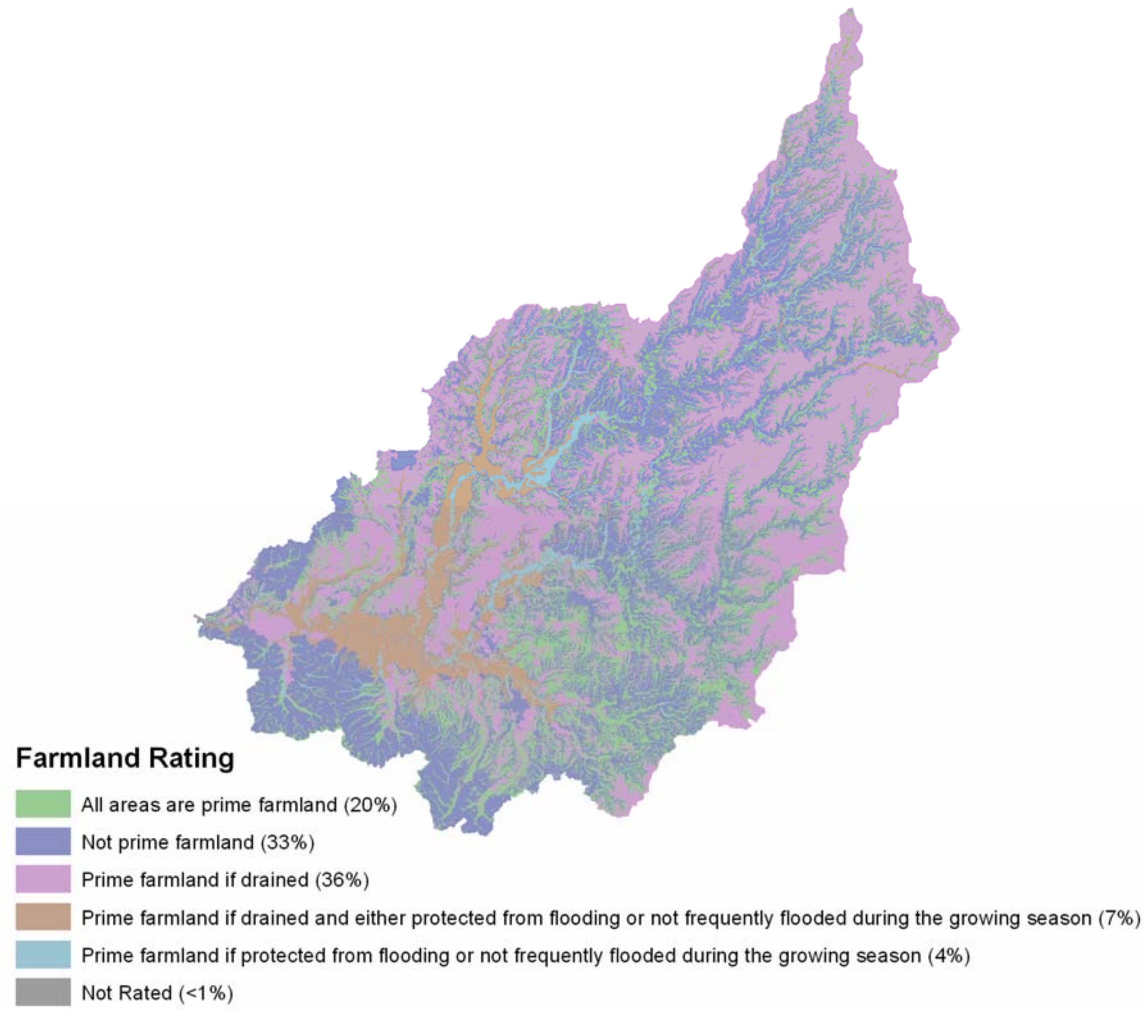
The dominant soil orders in this watershed are Alfisols, Inceptisols, and Mollisols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or illitic mineralogy. They are very deep, generally are very poorly drained to somewhat poorly drained, and are loamy or clayey. The dominant kinds of parent material are clayey till and lacustrine sediments. Others include outwash, alluvium, loess, and organic deposits. Hapludalfs (Glynwood and Morley series), Epiaqualfs (Blount, Nappanee, and Pandora series), Endoaqualfs (Wetzel series), and Argiaquolls (Pewamo series) are on till plains. Endoaquolls (Milford and Montgomery series) and Epiaqualfs (Del Rey series) are on lake plains. Haplosaprists (Houghton and Linwood series), Humaquepts (Roundhead and Wallkill series), and Endoaquepts (Wunabuna series) are in deep depressions or potholes. Hapludalfs (Belmore, Eldean, and Fox series), Endoaqualfs (Sleeth series), and Argiaquolls (Millgrove, Rensselaer, and Westland series) are on terraces and outwash plains. Eutrudepts (Genesee series), Endoaquepts (Shoals series), and Endoaquolls (Saranac and 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.”

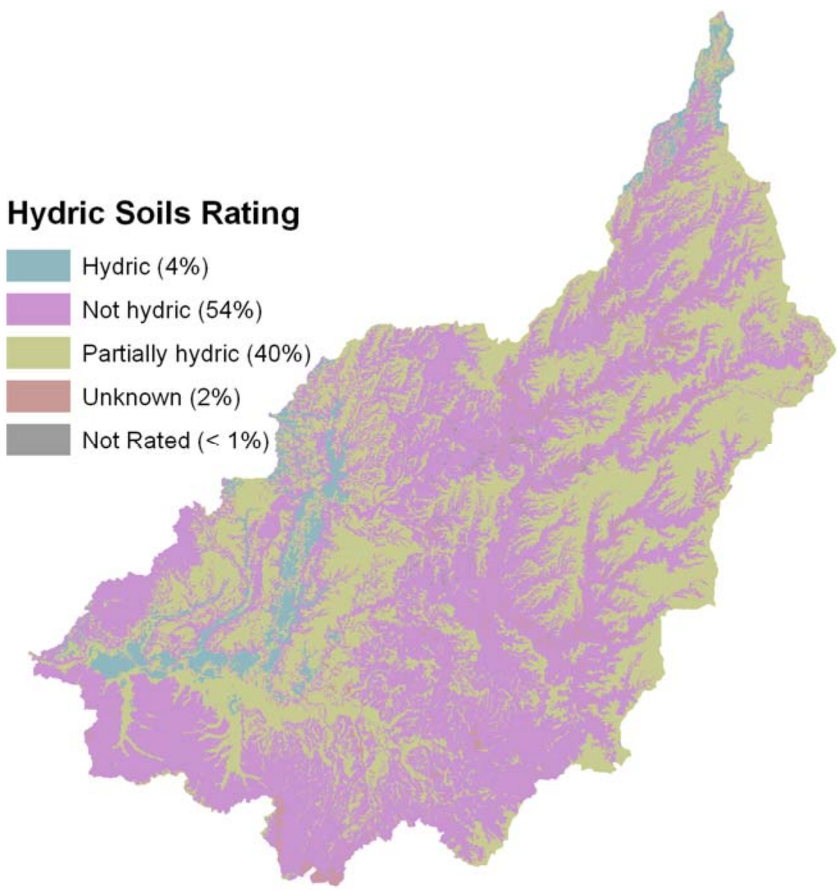


Farmland Classification Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and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



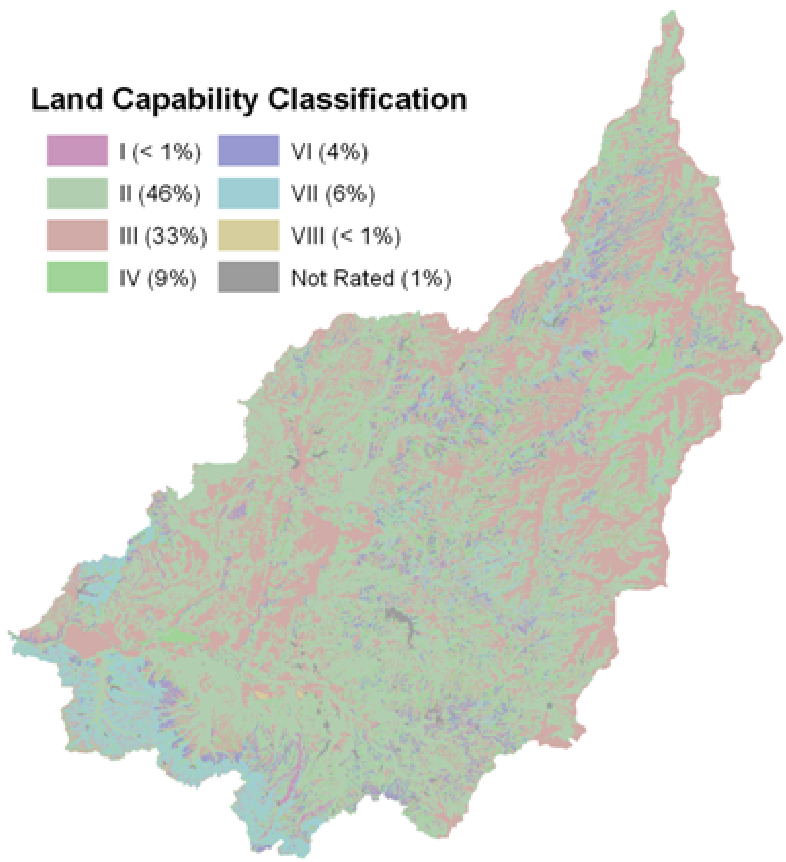
If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make on site determinations of hydric soils are specified 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

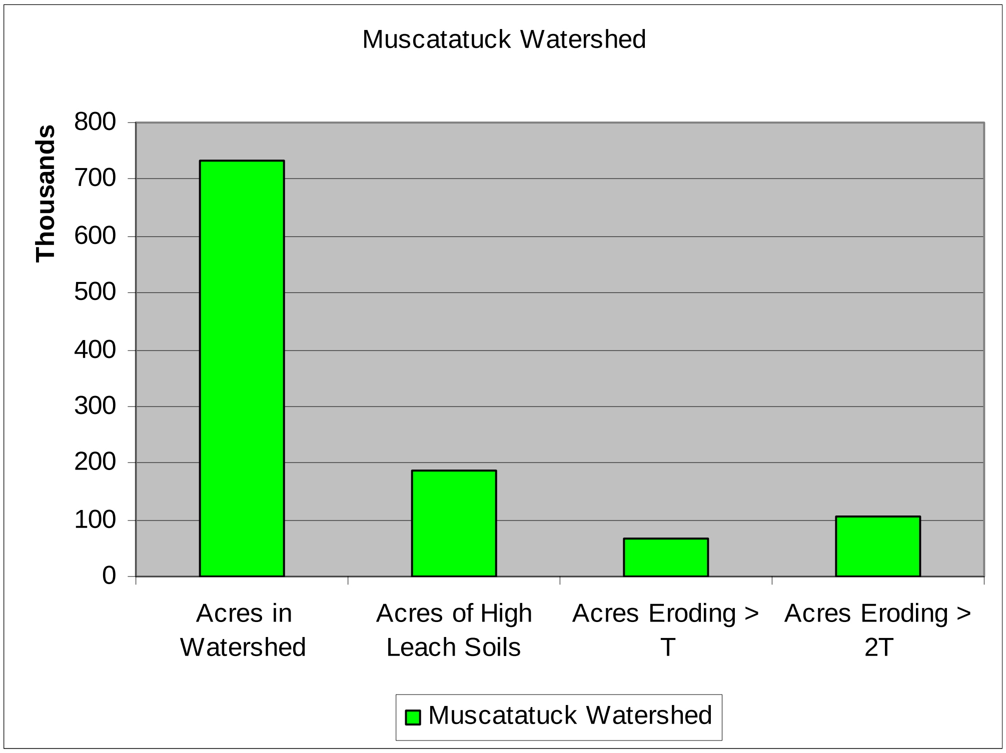
Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond 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

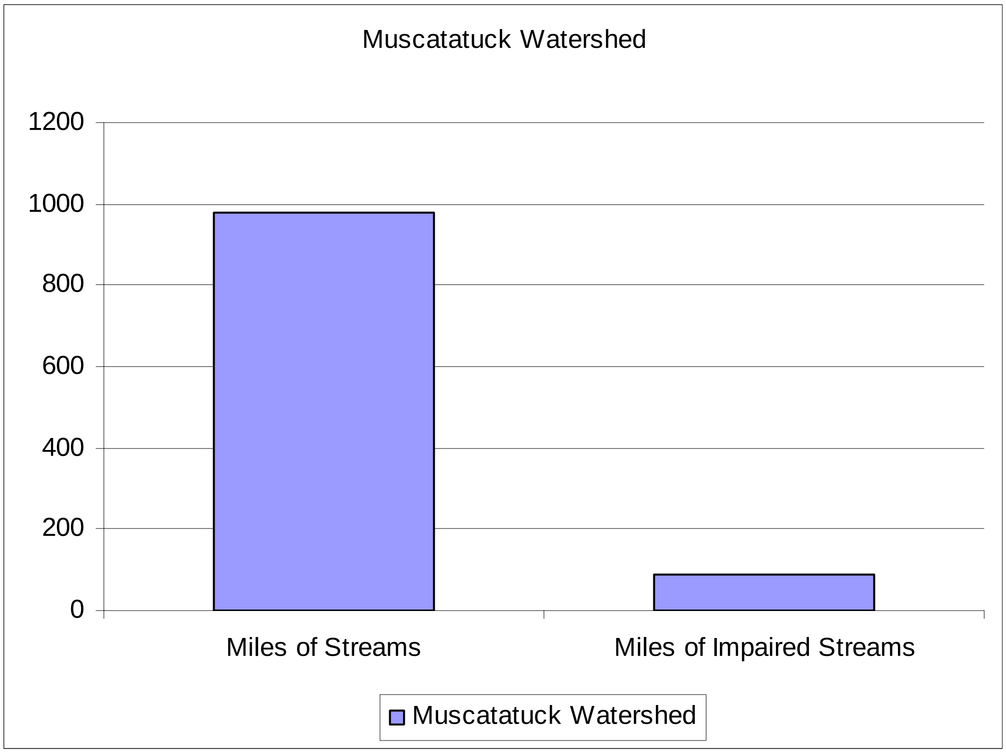
Stakeholders and electronic analysis have been identified the following resource concerns as being the top priority:

- Soil Quality – The watershed has over 179100 acres of soils subject to soil erosion. The vast majority of this is acreage; over 174,600 acres are subject to water erosion. There are over 105,000 acres currently eroding over twice the tolerable limit, or "T", from water erosion. These totals represent some 25 percent of the watershed.



- Ground Water Quality - The watershed has in excess of 188,000 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, nonpoint pollutants such as fertilizers, pesticides, and livestock waste have the potential to contaminate the ground water aquifer.

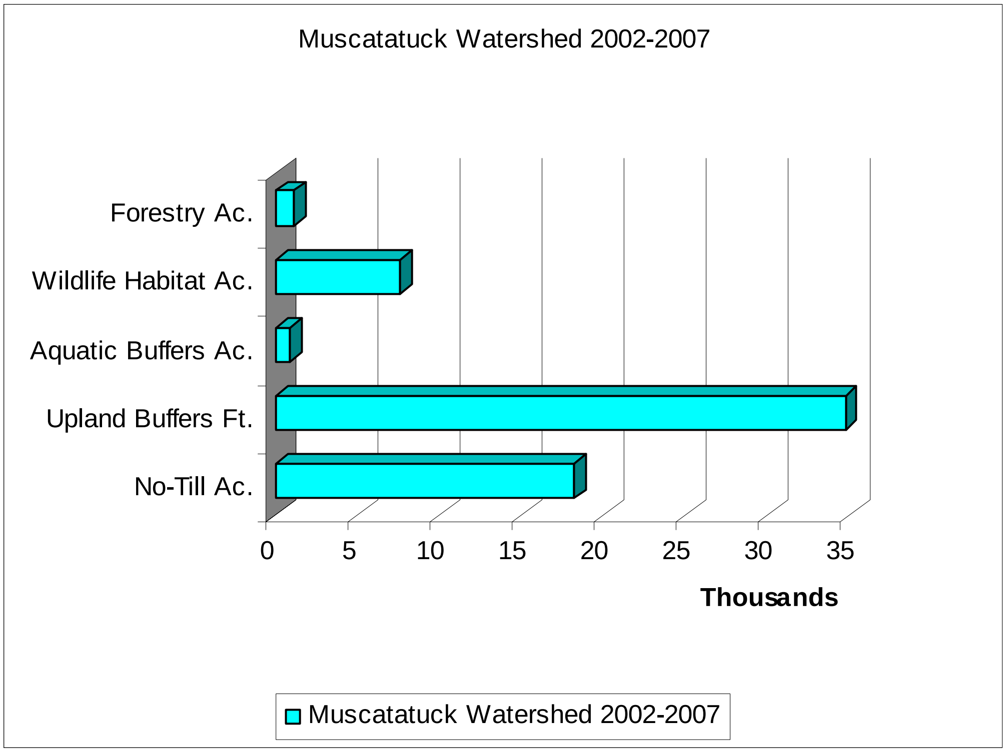
- Surface Water Quality – There is approximately nine percent of the streams within the watershed that have identified impairments. Excessive amounts of sediments, nutrients, and bacteria degrade the water quality causing an unbalanced fish community with depressed populations and limited diversity.



- Threatened & Endangered Species – Just over 20 percent of the 731,300 acres in the watershed lie within the range of know Threatened and Endangered Species.
- Air Quality – 16.6 percent of the watershed has been identified by the Environmental Protection Agency as have an air quality concern.

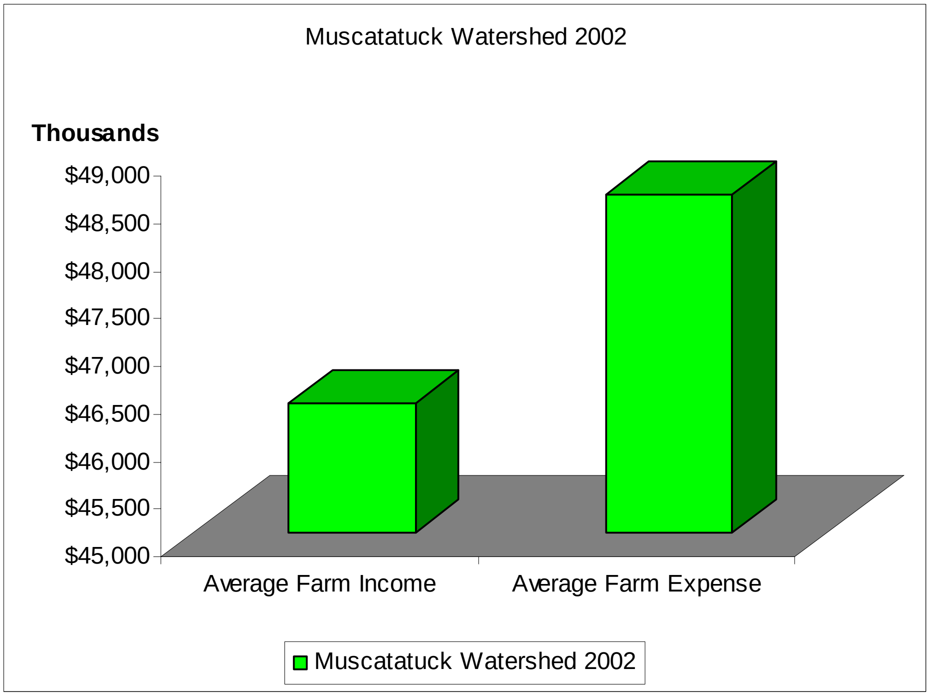
Performance Results System and Other Data

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 18,270 acres of No-Till, approximately 34,800 feet of upland buffers, and just over 850 acres of aquatic buffers. Wildlife habitat has been improved or established on more than 7,650 acres within the watershed and just less than 1,100 acres of forestry practices have been applied.

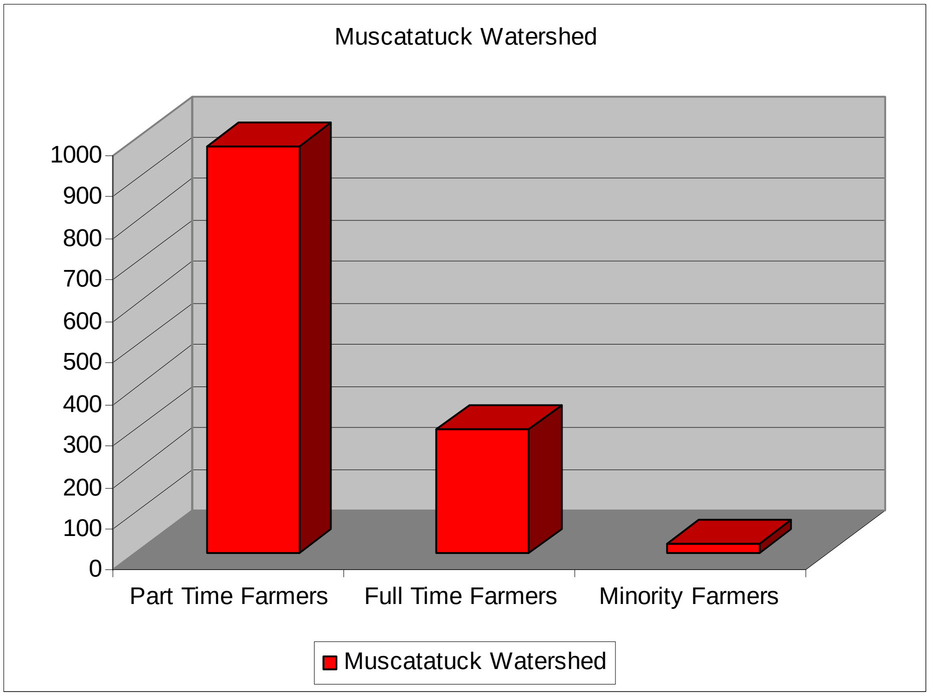


Census and Social Data (Relevant)

There are approximately 5835 farms in the watershed that average approximately 204 acres in size.



The 2002 average farm total income for all the counties was $46,355,000 while average expense was $48,563,000.



There are approximately 980 part time farmers, 296 full time farmers and 21 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