USDA NRCS
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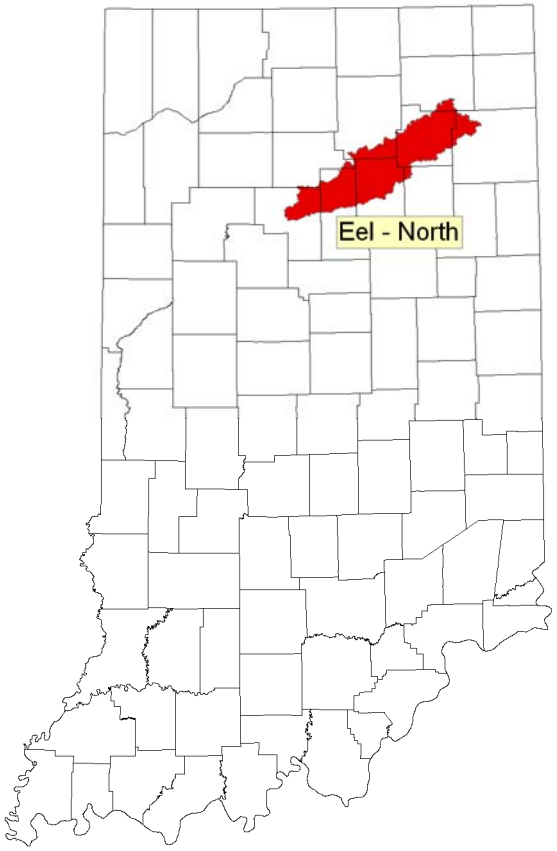
Natural Resources Conservation Service

Rapid Watershed Assessment
Eel 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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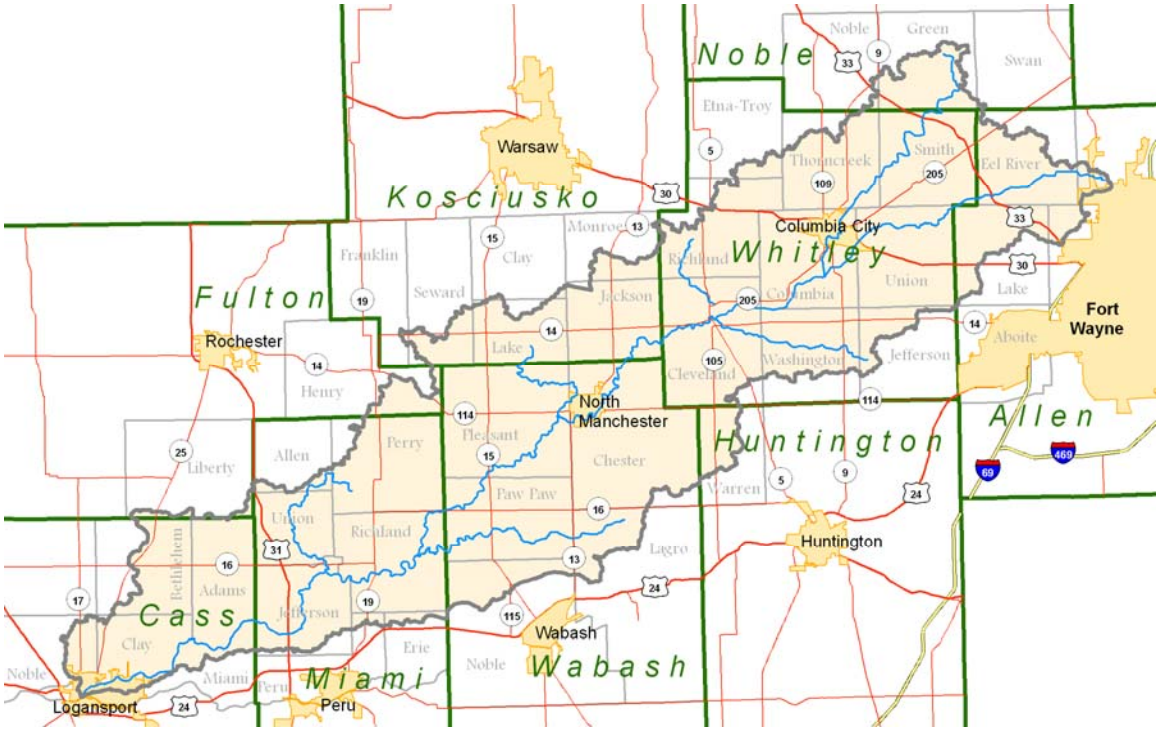
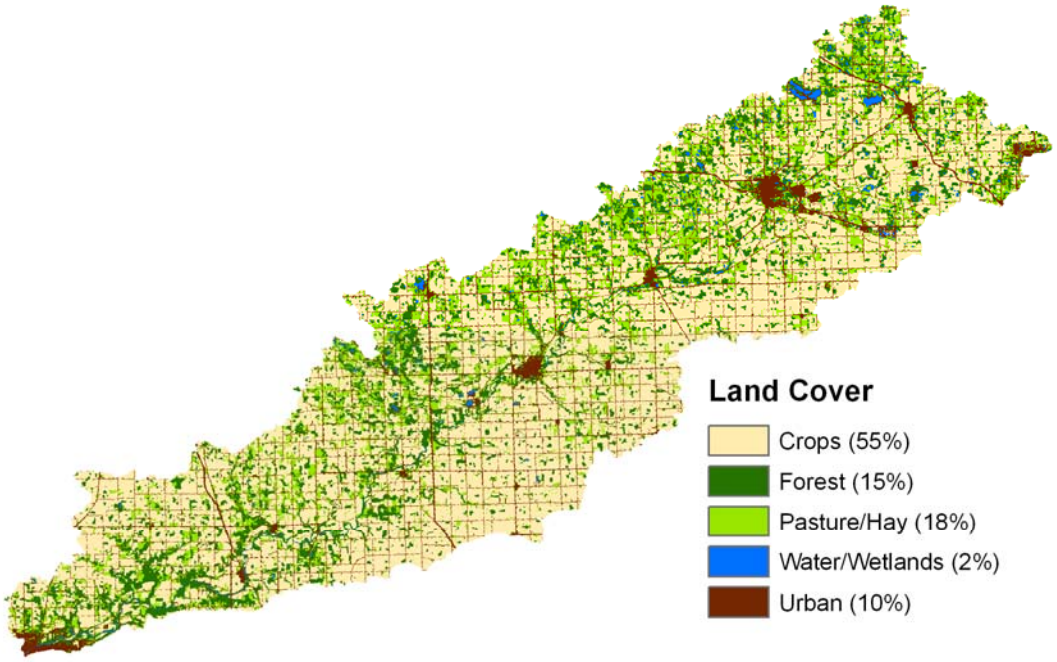
Eel Watershed



Introduction

The Eel watershed is an eight digit (05120104) hydrologic unit code HUC) watershed located in the Northeastern part of Indiana. The watershed drainage area is just over 529,900 acres. The watershed covers nine different Indiana counties. It is subdivided into 37 subbasins represented on the map by 12 digit HUCs (Figure 2-1).



The Eel River originates in Allen County and flows to the southwest for approximately 110 miles before discharging into the Wabash River near Logansport, Indiana. The landscape along the Eel River is predominately one of agriculture and forest, but the river does flow through some populated areas.

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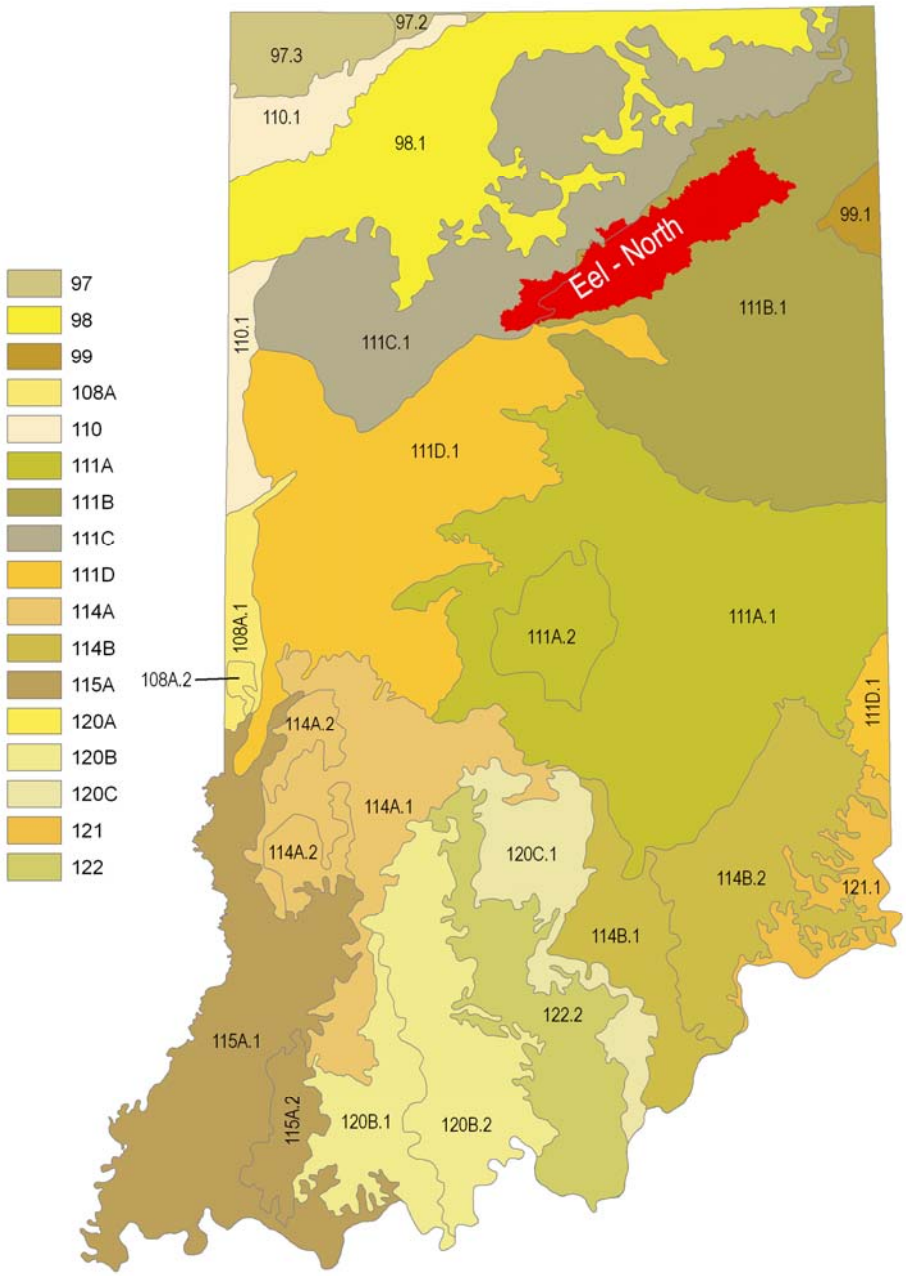
Common Resource Area

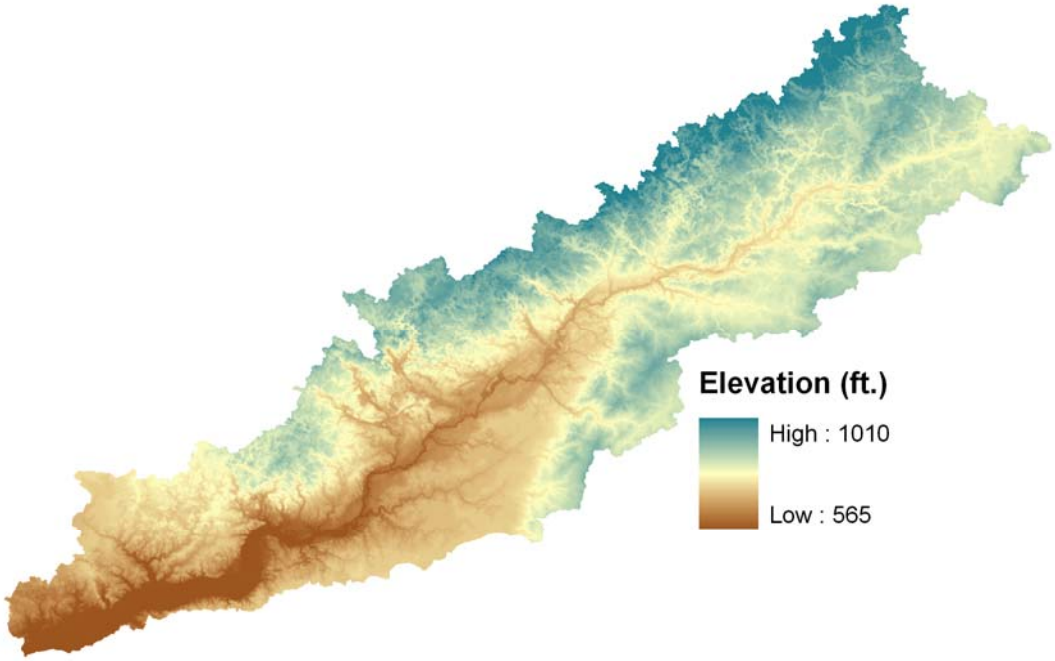
The common resource area for the watershed:

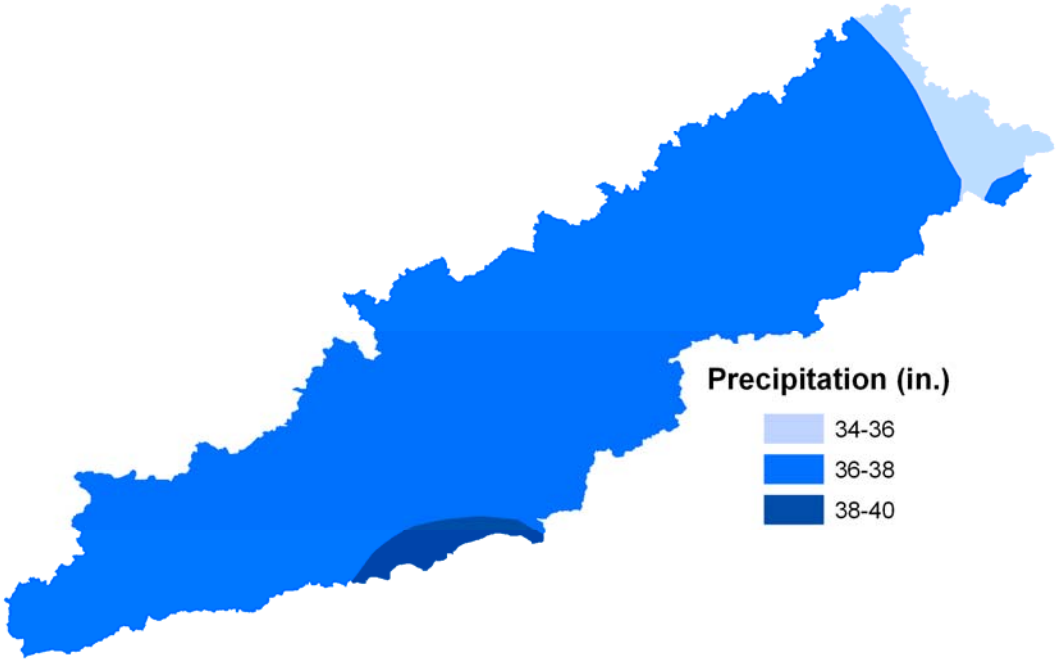
The Indiana and Ohio Till Plain, Northeastern Part – (111B.1). Broad, level clayey till plain with some end moraines, lake basins, and sand and gravel outwash. Extensive corn, soybean, wheat, and livestock farming on artificially drained soils with scattered woodlots. Soils are well drained to very poorly drained, formed in Wisconsin Age glacial drift derived mostly from limestone and dolomite.



Physical Description

The Eel watershed is an eight digit (05120104) hydrologic unit code HUC) watershed located in the Northeastern part of Indiana. The watershed drainage area is just over 529,900 acres. The watershed covers nine different Indiana counties. It is subdivided into 37 subbasins represented on the map by 12 digit HUCs (Figure 2-1). The Eel River originates in Allen County and flows to the southwest for approximately 110 miles before discharging into the Wabash River near Logansport, Indiana. The landscape along the Eel River is predominately one of agriculture and forest, but the river does flow through some populated areas.





Assessment of waters

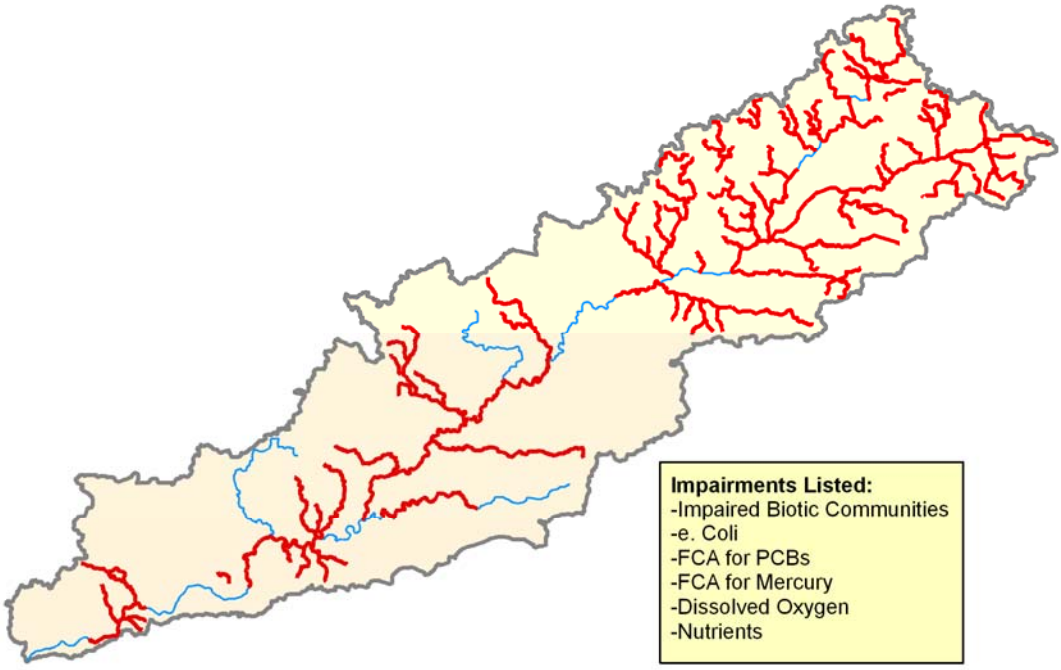
Section 303(d) of the Clean Water Act requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. The Clean Water Act Section 303(d) list for Indiana provides a basis for understanding the current status of water quality in the Eel North Watershed.

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INB0454_00	BEARGRASS CREEK	E. COLI
INB0411_01	BENWARD DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0411_T1002	BENWARD DITCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0424_T1026	BLUE BABE BRANCH (DOWNSTREAM OF SR 9)	IMPAIRED BIOTIC COMMUNITIES
INB0424_T1024	BLUE BABE BRANCH (HEADWATER)	IMPAIRED BIOTIC COMMUNITIES
INB0424_T1020	BLUE BABE BRANCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0424_T1021	BLUE BABE BRANCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0424_T1023	BLUE BABE BRANCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0421_00	BLUE RIVER - HEADWATERS (NOBLE)	IMPAIRED BIOTIC COMMUNITIES
INB0424_00	BLUE RIVER (COLUMBIA CITY)	E. COLI
INB0424_00	BLUE RIVER (COLUMBIA CITY)	IMPAIRED BIOTIC COMMUNITIES
INB0424_01	BLUE RIVER (DOWNSTREAM OF COLUMBIA CITY)	E. COLI
INB0422_01	BLUE RIVER (DOWNSTREAM OF MUD RUN)	IMPAIRED BIOTIC COMMUNITIES
INB0411_T1001	BOBAY DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0412_T1005	CHURUBUSCO BRANCH	IMPAIRED BIOTIC COMMUNITIES
INB0412_T1004	CHURUBUSCO BRANCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0435_01	CLEAR CREEK	E. COLI
INB0435_01	CLEAR CREEK	IMPAIRED BIOTIC COMMUNITIES
INB0435_00	CLEAR CREEK (HEADWATER)	E. COLI

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INB0435_T1002	CLEAR CREEK (HEADWATER)-UNNAMED TRIBUTARY	E. COLI
INB0435_T1003	CLEAR CREEK-UNNAMED TRIBUTARY	E. COLI
INB0435_T1003	CLEAR CREEK-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0423_T1007	COLE DITCH (DOWNSTREAM OF TRIBUTARIES)	IMPAIRED BIOTIC COMMUNITIES
INB0423_T1004	COLE DITCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0423_T1005	COLE DITCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0434_T1006	COMPTON DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0431_T1001	COUNTY FARM DITCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0431_T1002	DOWELL DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0412_T1003	DUGLAY DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0457_T1015	EEL RIVER	FCA for MERCURY
INB0461_T1016	EEL RIVER	FCA for MERCURY
INB0462_T1017	EEL RIVER	FCA for MERCURY
INB0464_T1018	EEL RIVER	FCA for MERCURY
INB0471_T1019	EEL RIVER	FCA for MERCURY
INB0475_T1020	EEL RIVER	FCA for MERCURY
INB0476_T1021	EEL RIVER	FCA for MERCURY
INB0476_T1027	EEL RIVER	FCA for MERCURY
INB0477_T1023	EEL RIVER	FCA for MERCURY
INB0412_T1000	EEL RIVER	IMPAIRED BIOTIC COMMUNITIES
INB0414_T1002	EEL RIVER	E. COLI
INB0414_T1002	EEL RIVER	IMPAIRED BIOTIC COMMUNITIES
INB0431_T1003	EEL RIVER	IMPAIRED BIOTIC COMMUNITIES
INB0441_T1006	EEL RIVER	E. COLI
INB0445_T1010	EEL RIVER	E. COLI
INB0447_T1011	EEL RIVER	E. COLI
INB0448_T1012	EEL RIVER	E. COLI
INB0451_T1013	EEL RIVER	E. COLI
INB0453_T1014	EEL RIVER	E. COLI
INB0457_T1015	EEL RIVER	E. COLI
INB0462_T1017	EEL RIVER	E. COLI
INB0464_T1018	EEL RIVER	E. COLI
INB0475_T1020	EEL RIVER	E. COLI
INB0476_T1021	EEL RIVER	E. COLI
INB0477_T1022	EEL RIVER - LOAGANSPORT WATER INTAKE	FCA for MERCURY
INB0413_T1001	Eel River - mainstem	FCA for MERCURY
INB0413_T1001	Eel River - mainstem	FCA for PCBs
INB0414_T1002	Eel River - mainstem	FCA for MERCURY
INB0414_T1002	Eel River - mainstem	FCA for PCBs
INB0431_T1003	Eel River - mainstem	FCA for MERCURY
INB0431_T1003	Eel River - mainstem	FCA for PCBs
INB0432_T1004	Eel River - mainstem	FCA for MERCURY
INB0432_T1004	Eel River - mainstem	FCA for PCBs
INB0435_T1005	Eel River - mainstem	FCA for MERCURY
INB0435_T1005	Eel River - mainstem	FCA for PCBs
INB0441_T1006	Eel River - mainstem	FCA for MERCURY
INB0441_T1006	Eel River - mainstem	FCA for PCBs
INB0444_T1009	Eel River - mainstem	FCA for PCBs
INB0445_T1010	Eel River - mainstem	FCA for PCBs
INB0447_T1011	Eel river - mainstem	FCA for PCBs
INB0448_T1012	Eel River - mainstem	FCA for PCBs
INB0451_T1013	Eel River - mainstem	FCA for PCBs

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INB0453_T1014	Eel River - mainstem	FCA for PCBs
INB0457_T1015	Eel River - mainstem	FCA for PCBs
INB0461_T1016	Eel River - mainstem	FCA for PCBs
INB0462_T1017	Eel River - mainstem	FCA for PCBs
INB0464_T1018	Eel River - mainstem	FCA for PCBs
INB0462_00	EEL RIVER - WASHONIS CREEK	E. COLI
INB0413_T1001	EEL RIVER (EAST OF EEL RIVER FORT MONUMENT)	E. COLI
INB0413_T1002	EEL RIVER (WEST OF EEL RIVER FORT MONUMENT)	E. COLI
INB0413_T1006	EEL RIVER-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0431_01	EEL RIVER-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0432_02	EEL RIVER-UNNAMED TRIBUTARY	E. COLI
INB0422_T1025	EMERICK DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0437_T1003	GABLE DITCH	E. COLI
INB0437_T1002	GABLE DITCH-UNNAMED TRIBUTARY	E. COLI
INB0415_00	GANGWER DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0411_00	GELLER DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0437_T1001	HUFFMAN DITCH	E. COLI
INB0437_T1001	HUFFMAN DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0412_01	JOHNSON DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0412_T1001	JOHNSON DITCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0412_03	JOHNSON DRAIN (DOWNSTREAM OF CHURUBUSCO BRANCH)	IMPAIRED BIOTIC COMMUNITIES
INB0412_02	JOHNSON DRAIN (UPSTREAM OF CHURUBUSCO BRANCH)	IMPAIRED BIOTIC COMMUNITIES
INB0433_T1001	JONES BRANCH	IMPAIRED BIOTIC COMMUNITIES
INB0434_T1002	KALER BRANCH	IMPAIRED BIOTIC COMMUNITIES
INB0415_T1003	KERCH DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0434_T1004	KING BRANCH	IMPAIRED BIOTIC COMMUNITIES
INB0431_T1000	KNISLEY DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0413_T1005	KRIDER DITCH (NEAR JOHNSON ROAD)	IMPAIRED BIOTIC COMMUNITIES
INB0422_T1022	MALONEY DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0433_T1008	MAYNARD DITCH	DISSOLVED OXYGEN
INB0431_00	MAYNARD DITCH-COUNTY FARM DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0414_T1001	MOWREY DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0475_00	MUD BRANCH	E. COLI
INB0422_T1024	MUD RUN	IMPAIRED BIOTIC COMMUNITIES
INB0459_00	PAW PAW CREEK - OREN DITCH	E. COLI
INB0424_T1027	PHILLIPS DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0433_02	SCHUMAN DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0411_02	SHOAFF DAWSON DITCH	IMPAIRED BIOTIC COMMUNITIES
INB04P1035_00	SHRINER LAKE	IMPAIRED BIOTIC COMMUNITIES
INB0453_00	SILVER CREEK (LOWER)	E. COLI
INB0413_T1003	SMITH DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0414_00	SOLON DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0414_T1000	SOLON DITCH-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0434_02	SPRING CREEK (BETWEEN CR 200S AND SCHOENAUER DITCH)	E. COLI
INB0434_01	SPRING CREEK (BETWEEN KALER BRANCH AND CR 200S)	E. COLI
INB0434_01	SPRING CREEK (BETWEEN KALER BRANCH AND CR 200S)	IMPAIRED BIOTIC COMMUNITIES
INB0434_03	SPRING CREEK (DOWNSTREAM OF SCHOENAUER DITCH)	E. COLI
INB0434_03	SPRING CREEK (DOWNSTREAM OF SCHOENAUER DITCH)	IMPAIRED BIOTIC COMMUNITIES
INB0433_00	SPRING CREEK (UPSTREAM OF BROWN DITCH)	IMPAIRED BIOTIC COMMUNITIES
INB0434_00	SPRING CREEK (UPSTREAM OF KALER BRANCH)	E. COLI
INB0433_T1002	SPRING CREEK-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INB0457_00	SQUIRREL CREEK (LOWER)	E. COLI
INB0432_00	STONY CREEK (EAST OF RABER ROAD)	E. COLI
INB0432_01	STONY CREEK (WEST OF RABER ROAD)	E. COLI
INB0432_01	STONY CREEK (WEST OF RABER ROAD)	IMPAIRED BIOTIC COMMUNITIES
INB0432_T1001	STONY CREEK-UNNAMED TRIBUTARY	E. COLI
INB0432_T1002	STONY CREEK-UNNAMED TRIBUTARY	E. COLI
INB0437_00	SUGAR CREEK	E. COLI
INB0436_01	SUGAR CREEK (DOWNSTREAM OF COX BRANCH)	IMPAIRED BIOTIC COMMUNITIES
INB0436_00	SUGAR CREEK (UPSTREAM OF COX BRANCH)	IMPAIRED BIOTIC COMMUNITIES
INB0437_T1004	SUGAR CREEK-UNNAMED TRIBUTARY	E. COLI
INB0412_T1002	SUTORIUS DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0445_00	Swank Creek	E. COLI
INB0423_T1002	THORN CREEK	IMPAIRED BIOTIC COMMUNITIES
INB0423_T1003	THORN CREEK-UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0471_T1004	UNNAMED TRIBUTARY	IMPAIRED BIOTIC COMMUNITIES
INB0437_T1005	WILLIAMSON DITCH	E. COLI
INB0437_T1005	WILLIAMSON DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0461_T1001	WILSON RHODES DITCH	DISSOLVED OXYGEN
INB0461_T1001	WILSON RHODES DITCH	IMPAIRED BIOTIC COMMUNITIES
INB0461_T1001	WILSON RHODES DITCH	NUTRIENTS

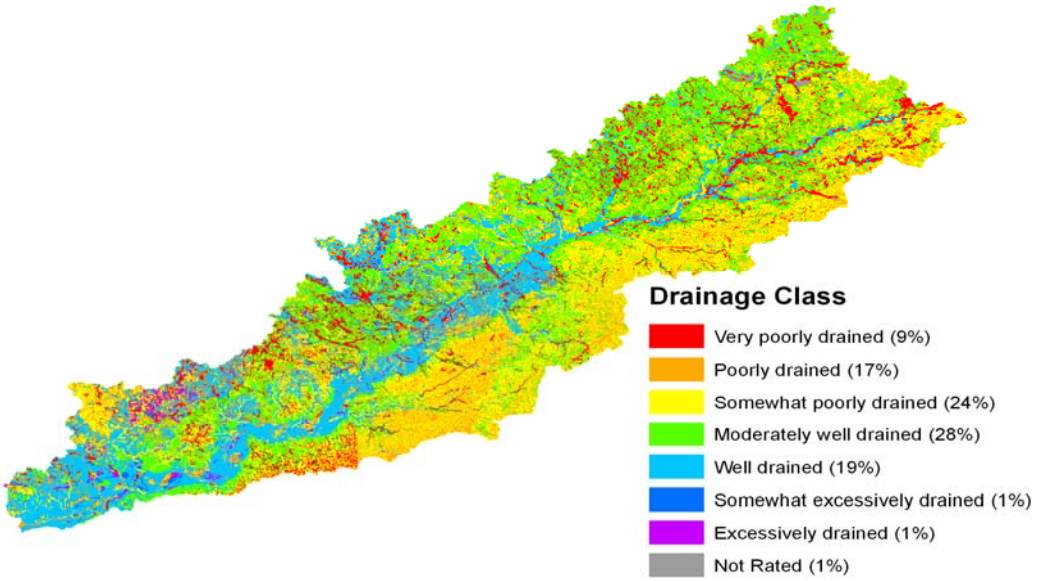


Soils

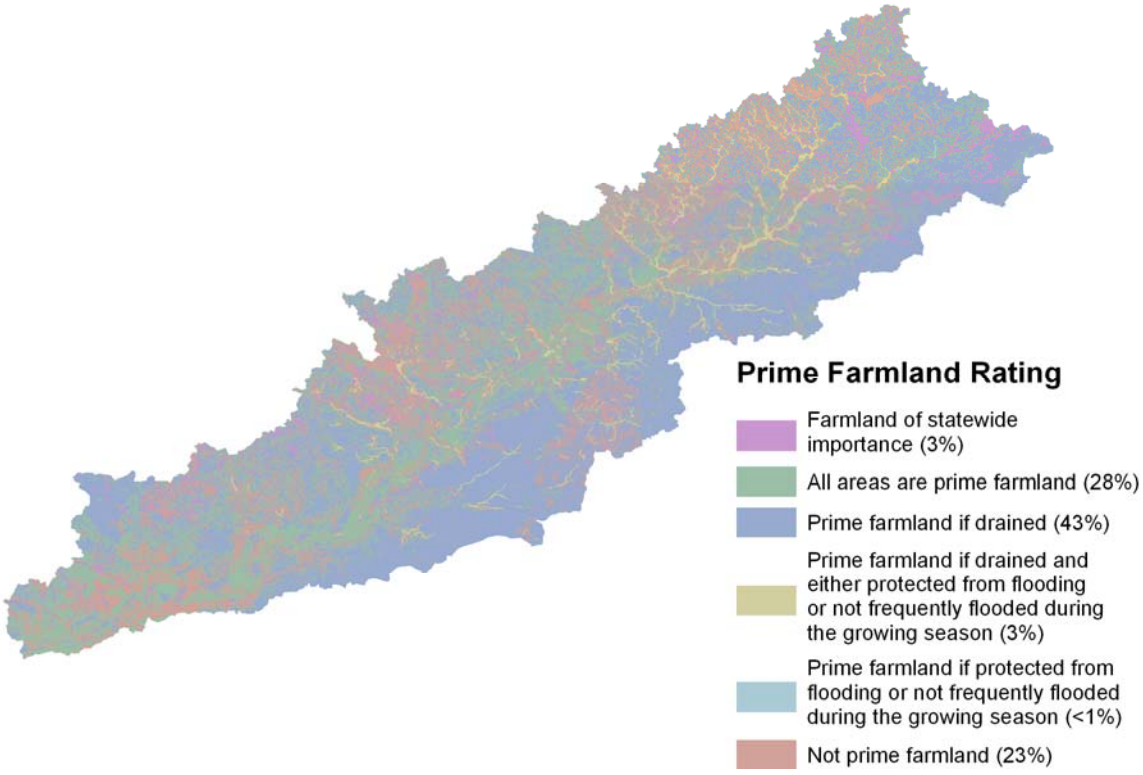
The dominant soil orders in MLRA (111B.1) are Alfisols, Inceptisols, and Mollisols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or illitic mineralogy. They are very deep, generally are very poorly drained to somewhat poorly drained, and 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.”



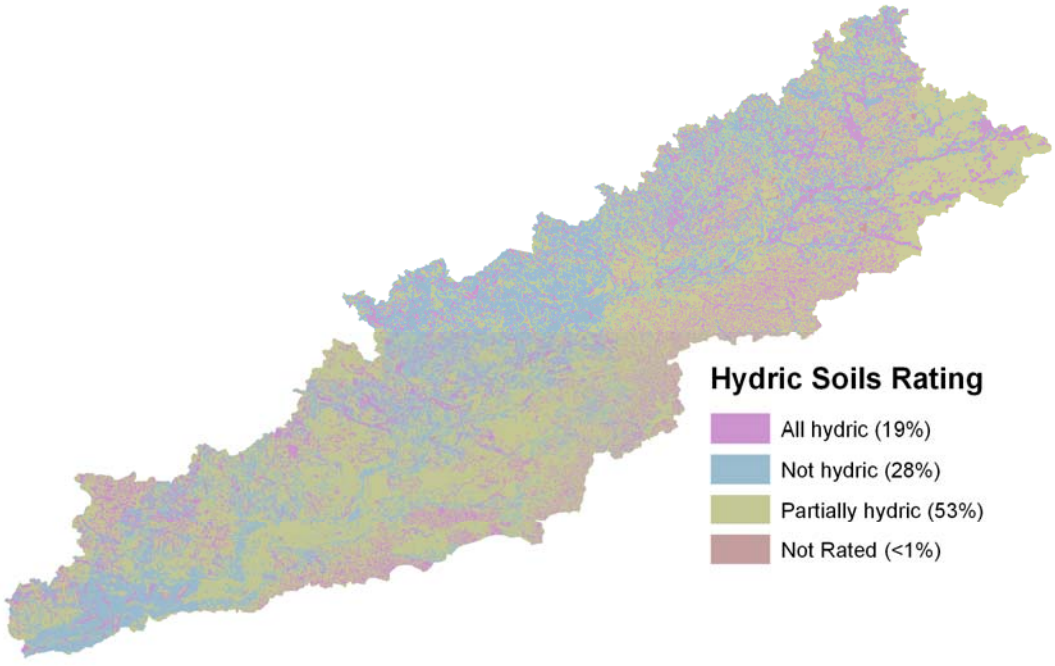
Farmland Classification Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and 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 hydirc soils are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).

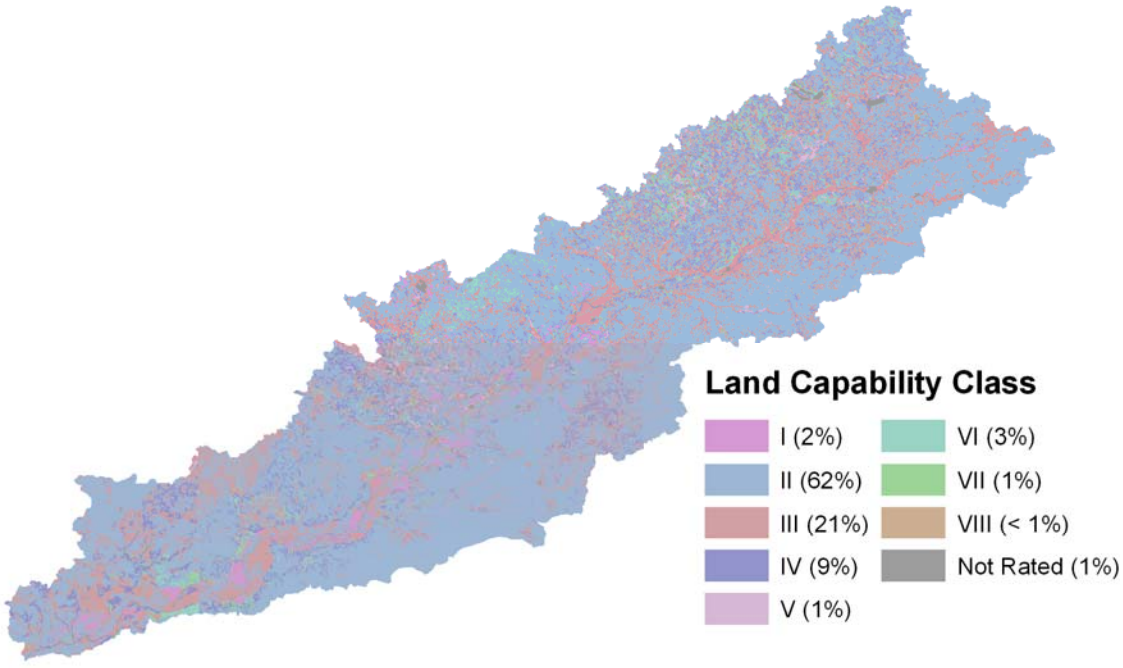


Highly Erodible Land (HEL)

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.

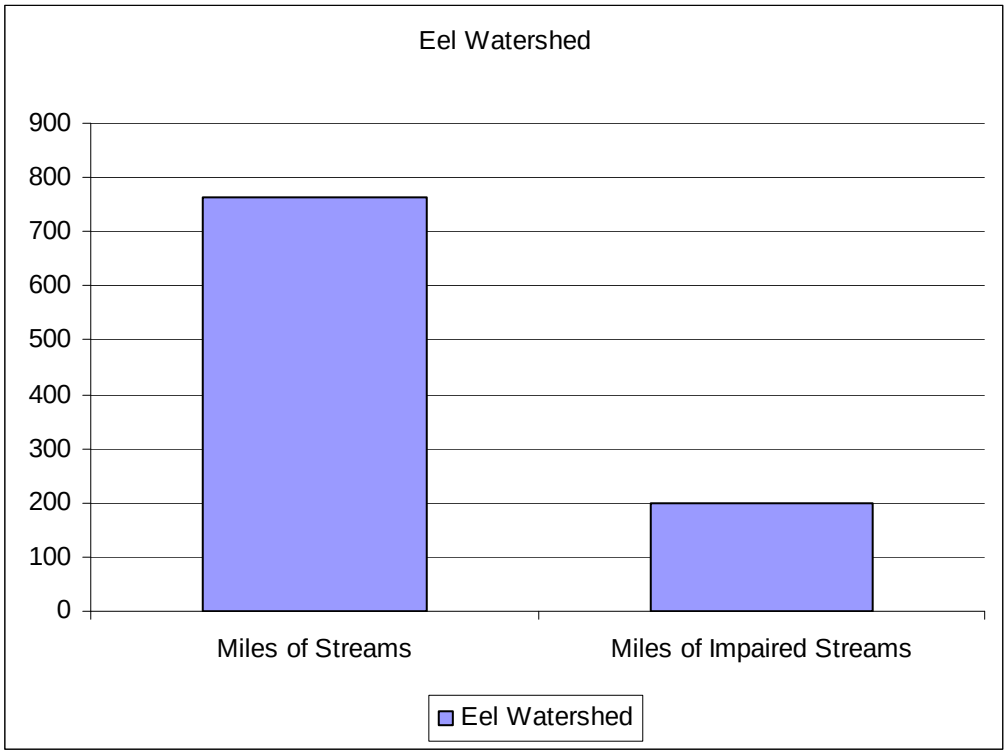
Land Capability Classification

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.

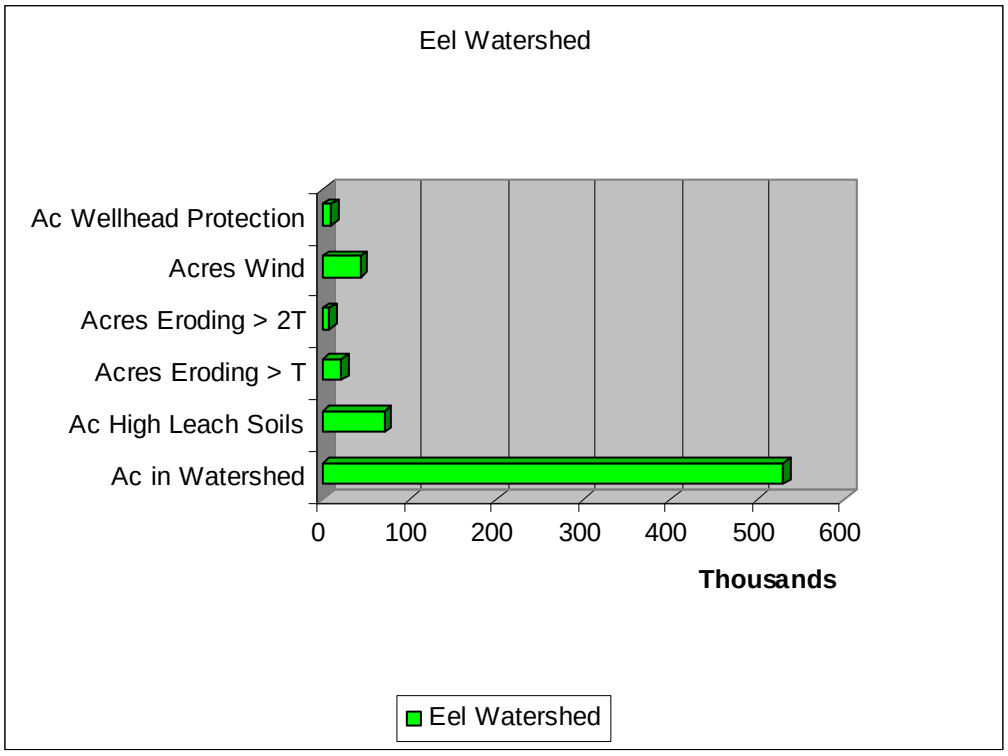


Resource Concerns
Stakeholders and electronic analysis have been identified the following resource concerns as being the top priority:

- Surface Water Quality – There is approximately 26 percent or 200 miles of the 763 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.

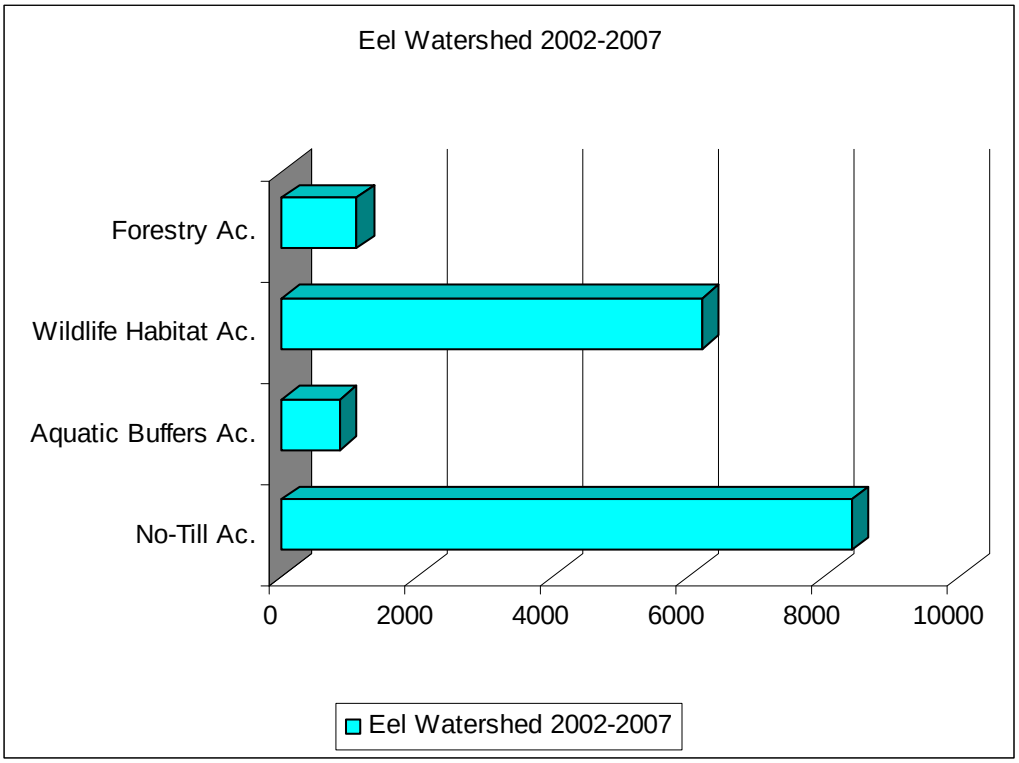


- Ground Water Quality - The watershed has in excess of 70,950 acres of soils with high leaching index (> 10) which allows containments on the land surface to be carried easily into the ground water from infiltrating water. There are an additional 10,800 acres of wellhead protection areas. Because of this condition, non–point pollutants such as fertilizers, pesticides, and livestock waste have the potential to contaminate the ground water aquifer.
- Air Quality – 6.9 percent of the watershed has been identified by the Environmental Protection Agency as have an air quality concern.
- Threatened & Endangered Species – Just over 5.9 percent of the 529,900 acres in the watershed lie within the range of know Threatened and Endangered Species.



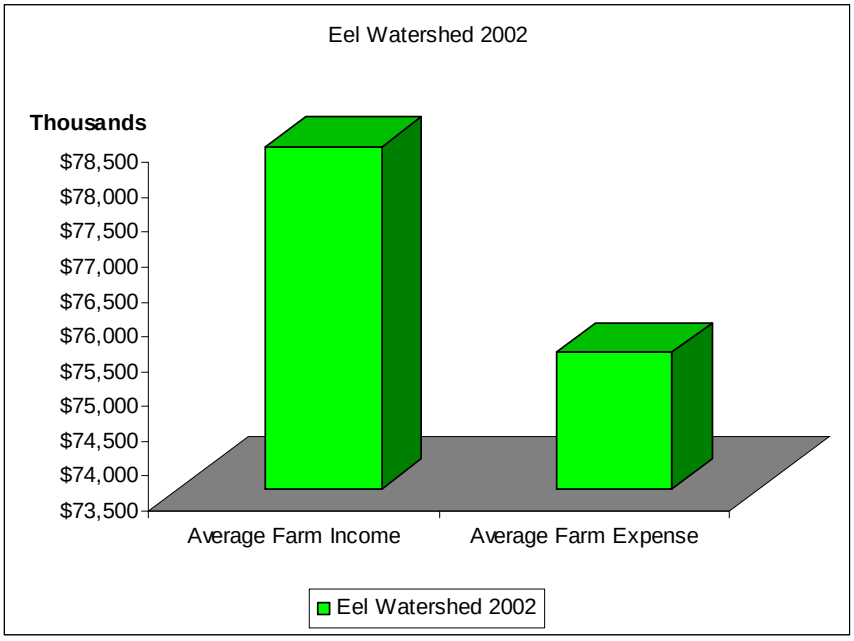
- Soil Quality – The watershed has over 73,000 acres of soils subject to soil erosion. There is over 7,600 acres eroding at twice the tolerable level or "T". There are also some 43,900 acres within the watershed that are subject to wind erosion.

Performance Results System and Other Data
The producers within the watershed have implemented a variety of conservation practices over the past five years.



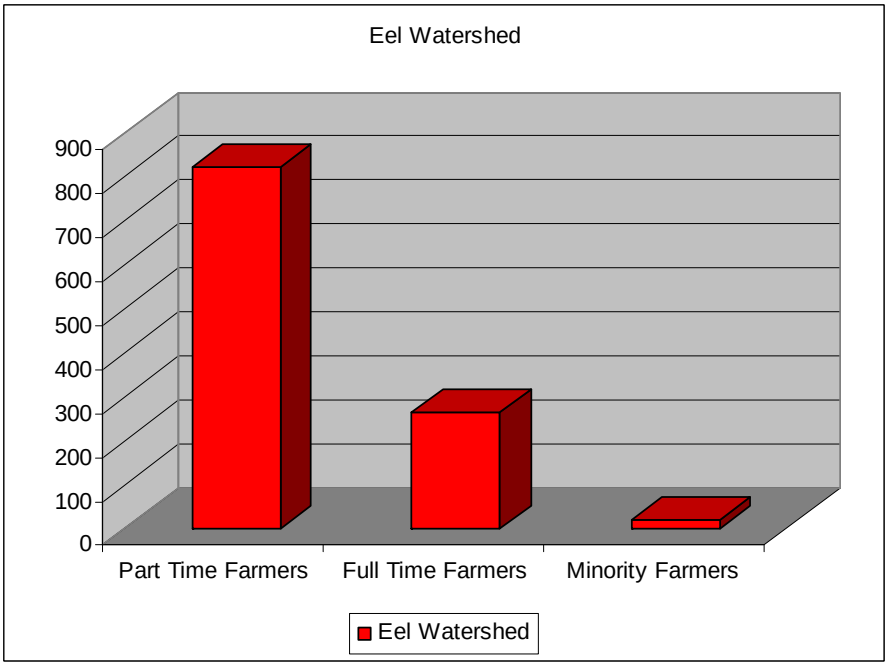
Since 2002 through 2007 landowners have implemented over 8,400 acres of No-Till, approximately 190,100 feet of upland buffers, and just over 850 acres of aquatic buffers. Wildlife habitat has been improved or established on more than 6,200 acres within the watershed and just over than 1,100 acres of forestry practices have been applied.

Census and Social Data (Relevant)
There are approximately 7860 farms in the watershed that average approximately 246 acres in size.



The 2002 average farm total income for all the counties was $78,400,000 while average expense was $75,450,000.

There are approximately 822 part time farmers, 262 full time farmers and 19 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