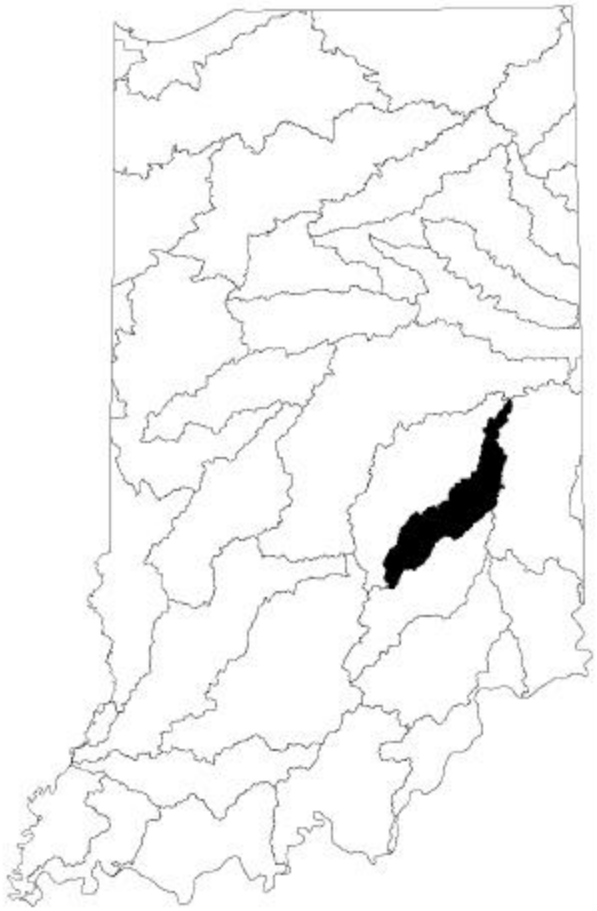
# Flatrock-Haw Creek Watershed Restoration Action Strategy

## Part I: Characterization and Responsibilities



***Prepared by***

Indiana Department of
Environmental Management
Office of Water Management

***May 2001***

# FOREWORD

The Flatrock-Haw Creek Watershed Restoration Action Strategy (WRAS) is intended to be a living document to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The first draft of the Flatrock-Haw Creek WRAS was released for public review during April 2001. This version of the WRAS incorporates public comments received during that time period.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

---

Wes Stone, Project Manager/Special Projects
IDEM Office of Water Management
100 N. Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015

wstone@dem.state.in.us

# TABLE OF CONTENTS

# List of Tables



# List of Figures



# Appenices

# EXECUTIVE SUMMARY

The overall goal and purpose of Part I of the Watershed Restoration Action Strategy (WRAS) is to provide a reference point and map to assist local citizens with improving water quality. The major water quality concerns and recommended management strategies will be addressed in Part II: Concerns and Recommendations of the WRAS.

This Strategy broadly covers the entire watershed; therefore, it is intended to be an overall strategy and does not dictate management and activities at the stream site or segment level. Water quality management decisions and activities for individual portions of the watershed are most effective and efficient when managed through sub-watershed plans. However, these sub-watershed plans must also consider the impact on the watershed as a whole.

This Strategy is intended to be a fluid document in order to respond to the changing and dynamic quality of our environment. Therefore, this Strategy will require revision when updated information becomes available.

## Overview of the Flatrock-Haw Creek Watershed

The Flatrock River originates in the northeastern portion of Henry County and flows south and westward through Rush, Shelby, and Bartholomew counties. The Flatrock River joins the Driftwood River, near Columbus, Indiana, to form the East Fork of the White River. Historically, the approximately 88 river miles of the Flatrock River hosted 30 mills that produced essential materials for settlers (IDNR 1999). Remnants of this era include numerous small dams and many covered bridges.

## Current Status of Water Quality in the Flatrock-Haw Creek Watershed

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 Flatrock-Haw Creek Watershed. The following waterbodies are on Indiana's 1998 Clean Water Act Section 303(d) list submitted to and approved by EPA:

| Water Body | Location/Reach | County | Parameter(s) of Concern | HUC | Subwatershed(s) |
|---|---|---|---|---|---|
| Flat Rock River | All | Rush | FCA for Hg | 05120205 | 020 040 |
| Flat Rock River | All | Shelby | FCA for PCB & Hg | 05120205 | 020 040 |

FCA - Fish Consumption Advisory
PCB - Polychlorinated Biphenyls
Hg - Mercury
***Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above. The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish

Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.

## Water Quality Goal

The overall water quality goal for the Flatrock-Haw Creek Watershed is that all waterbodies meet the applicable water quality standards for their designated uses as determined by the State of Indiana, under the provisions of the Clean Water Act.

# Flatrock-Haw Creek Watershed Restoration Action Strategy

# Part I: Characterization and Responsibilities

## 1. Introduction

The Clean Water Action Plan states that "States and tribes should work with public agencies and private-sector organizations and citizens to develop, based on the initial schedule for the first two years, Watershed Restoration Action Strategies, for watersheds most in need of restoration." A WRAS is essentially a large-scale coordination plan for an eight-digit hydrologic unit watershed. Each year, more assessments and data may become available. This will require amendments to the WRAS, which must be flexible and broad enough to accommodate change. The WRAS will also foster greater cooperation among State and Federal agencies, which should result in more effective use of personnel and resources.

The WRAS provides an opportunity to assemble, in one place, projects and monitoring that has been completed or is on going within a watershed. It also allows agencies and stakeholders to compare watershed goals and provides a guide for future work within a watershed.

The WRAS for the Flatrock-Haw Creek watershed contains two parts. Part I provides a characterization of water quality in the watershed and agency responsibilities. Part II provides a discussion of resource concerns and recommended strategies.

### 1.1 Purpose of This Document

The overall goal and purpose of the Watershed Restoration Action Strategy Part I is to provide a reference point and roadmap to assist with improving water quality. Part I is a compilation of information, facts, and local concerns in this watershed. It will serve as a reference document for watershed groups and others involved in the assessment and planning of watershed restoration activities.

Part I of the Strategy is intended to be a fluid document in order to respond to the changing and dynamic quality of our environment. Therefore, it will require revision when updated information becomes available.

### 1.2 Guide to the Use of This Document

**Chapter 1: Introduction** - This Chapter provides a non-technical description of the purpose of Part 1 of the Strategy. This Chapter also provides an overview of stakeholder groups in the Flatrock-Haw Creek watershed.

**Chapter 2: General Watershed Description**- Some of the specific topics covered in this chapter include:

An overview of the watershed
Hydrology of the watershed

A summary of land use within the watershed
Natural resources in the watershed
Population statistics
Major water uses in the watershed
Water quality classifications and standards

**Chapter 3: Causes and Sources of Water Pollution** - This Chapter describes a number of important causes of water quality impacts including biochemical oxygen demand (BOD), toxic substances, nutrients, E. coli bacteria and others. This Chapter also describes both point and nonpoint sources of pollution.

**Chapter 4: Water Quality and Use Support Ratings** - This Chapter describes the various types of water quality monitoring conducted by IDEM. It summarizes water quality in the watershed based on Office of Water Management data, and presents a summary of use support ratings for those surface waters that have been monitored or evaluated.

**Chapter 5: State and Federal Water Quality Programs** - Chapter 5 summarizes the existing State and Federal point and nonpoint source pollution control programs available to address water quality problems. These programs are management tools available for addressing the priority water quality concerns and issues that are discussed in Part II of the Strategy. Chapter 5 also describes the concept of Total Maximum Daily Loads (TMDLs). TMDLs represent management strategies aimed at controlling point and nonpoint source pollutants. IDEM's TMDL Strategy will also be discussed.

## 1.3 Stakeholder Groups in the Watershed

The Flatrock-Haw Creek watershed contains several stakeholder groups that have different missions (Appendix C). Many of these groups have a long history of conservation work in the Flatrock-Haw Creek watershed. The following discussions briefly describe some of the watershed groups.

*Flatrock River Watershed Steering Committee*

The focus of the Flatrock River Watershed Steering Committee is flood control; however, they are also concerned about water quality and improving recreational value. In 1997, this group completed the Flatrock River Watershed Management Plan, which is included in this WRAS document as Appendix E.

*Soil and Water Conservation Districts (SWCDs)*

The Shelby and Rush County SWCDs are working cooperatively on the Conns Creek Watershed Project. Ultimately, this project will produce a Conns Creek watershed management plan, then implementation activities will commence within the watershed. The Shelby County SWCD also has an active volunteer water quality monitoring program.

# 2 General Watershed Description

This Chapter provides a general description of Flatrock-Haw Creek and its watershed and includes the following:

Section 2.1 Flatrock-Haw Creek Watershed Overview
Section 2.2 Land Cover, Population, and Growth Trends
Section 2.3 Agricultural Activities in the Flatrock-Haw Creek Watershed
Section 2.4 Significant Natural Areas in the Flatrock-Haw Creek Watershed
Section 2.5 Surface Water Use Designations and Classifications
Section 2.6 US Geological Survey Water Use Information for the Flatrock-Haw Creek Watershed

## 2.1 Flatrock-Haw Creek Watershed Overview

The Flatrock-Haw Creek watershed is an 8 digit (05120205) hydrologic unit code (HUC) watershed located in central Indiana (Figure 2-1). The watershed encompasses approximately 598 square miles in six different counties and approximately 568 miles of perennial streams. It is subdivided into 78 subbasins represented on the map by 14 digit HUCs (figure 2-2).

The Flatrock River originates in the northeastern portion of Henry County and flows south and westward through Rush, Shelby, and Bartholomew counties. The Flatrock River joins the Driftwood River, near Columbus, Indiana, to form the East Fork of the White River. Historically, the approximately 88 river miles of the Flatrock River hosted 30 mills that produced essential materials for settlers (IDNR 1999). Remnants of this era include numerous small dams and many covered bridges.

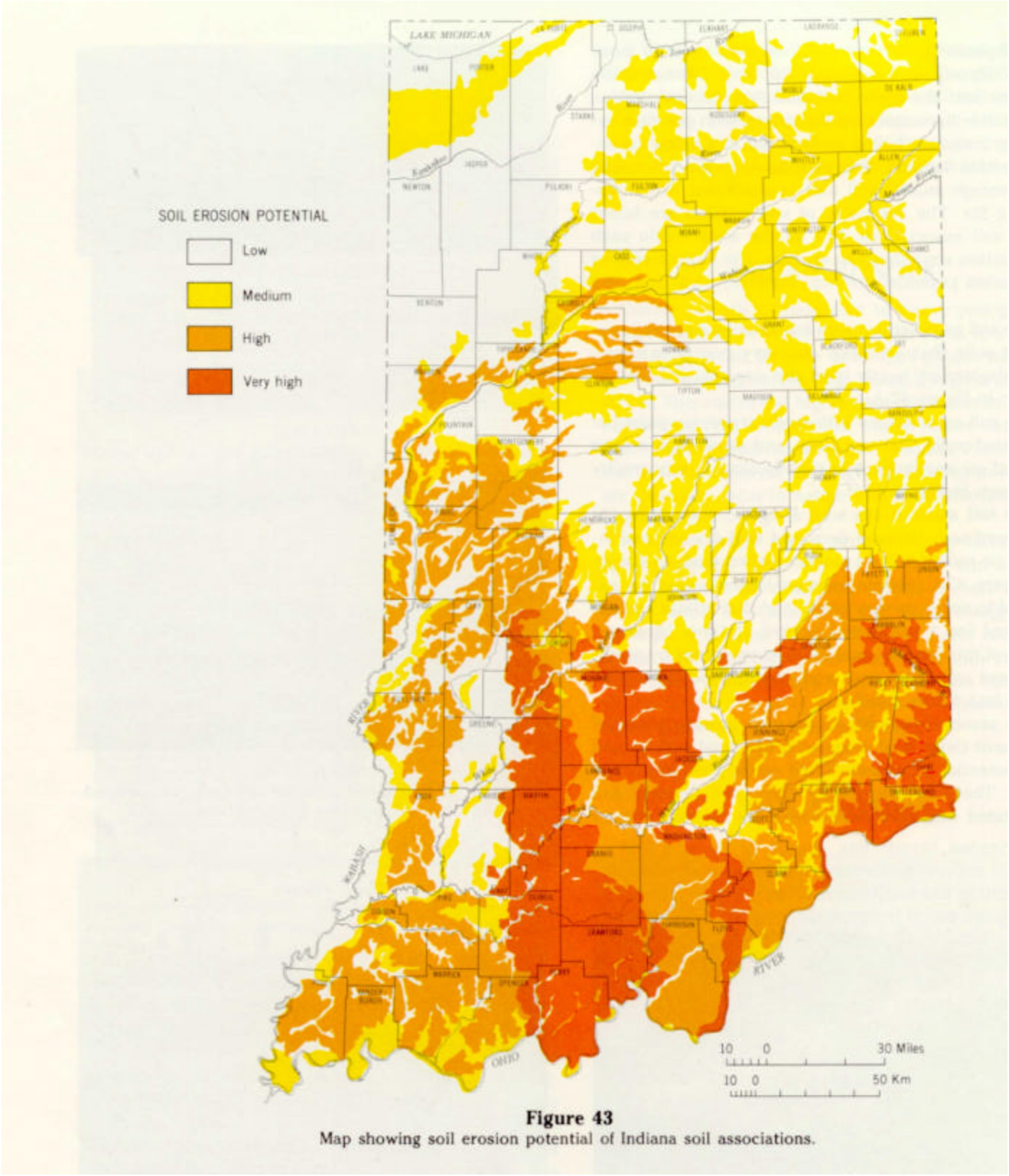



**Figure 43**
Map showing soil erosion potential of Indiana soil associations.

Figure 2-3 Erosion Potential *
**** from The Indiana Water Resource, IDNR, 1980***

## 2.2 Land Cover, Population, and Growth Trends

### *2.2.1 General Land Cover*

The U.S. Geological Survey - Biological Resources Division and the U.S. Fish and Wildlife Service are overseeing the National Gap Analysis Program (GAP). In Indiana, Indiana State University and Indiana University are carrying out the Indiana GAP Project which involves an analysis of current vegetative land cover through remote sensing (ISU 1999). This analysis provides vegetative land cover data in 30 by 30-meter grids (Figure 2-4). The following is a summary of vegetative cover in the watershed determined from the GAP image:

| | |
|---|---|
| 3.1% | Urban (impervious, low and high density) |
| 89.8% | Agricultural vegetation (row crop and pasture) |
| 4.6% | Forest vegetation (shrubland, woodland, forest) |
| 2.3% | Wetland vegetation (Palustrine: forest, shrubland, herbaceous) |
| 0.2% | Open Water |

### *2.2.2 Population*

The 1990 total population in the six counties that have land portions in the watershed was 219,892 (IRBC 1998). Table 2-1 shows a break down of population by county and estimated population projections. It should be noted that these numbers do not reflect the actual population living in the Flatrock-Haw Creek watershed. For example, only a portion of Decatur and Bartholomew counties are within the land area of the Flatrock-Haw Creek watershed (Figure 2-1). A better estimate of the population within the Flatrock-Haw Creek watershed may be the 1995 U.S. Geological Survey Water Use Report, which show a total population in the watershed of 66,080 in 1995 (Table 2-6).

The U.S. Census and the Indiana Business Research Center also provide information about the population in cities and towns. Table 2-2 contains population estimates for various cities and towns located wholly within the watershed.

## TABLE 2-1
## FLATROCK-HAW CREEK COUNTY POPULATION PROJECTIONS 1990-2020*

| County | 1990 | 2000 | 2010 | 2020 | Percent Change (1990 to 2020) |
|---|---|---|---|---|---|
| Bartholomew | 63,657 | 70,878 | 74,132 | 76,070 | 16.32 |
| Decatur | 23,645 | 26,439 | 28,073 | 29,047 | 18.60 |
| Fayette | 26,015 | 26,306 | 26,568 | 26,724 | 2.65 |
| Henry | 48,139 | 49,370 | 50,134 | 50,589 | 4.84 |
| Rush | 18,129 | 18,549 | 19,023 | 19,306 | 6.10 |
| Shelby | 40,307 | 44,674 | 46,986 | 48,363 | 16.66 |

* Source: Indiana Business Research Center, Indiana University Kelley School of Business
1998 Preliminary Series - Indiana County Population Projections.
*Last Updated on 3/10/99 By IBRC Email:* ibrc@iupui.edu

## TABLE 2-2
## FLATROCK-HAW CREEK CITY AND TOWN POPULATION ESTIMATES*

| City/Town | Census 1990 | Estimate 1999 | Percent Change (1990 to 1999) |
|---|---|---|---|
| Clifford | 308 | 352 | 14.3 |
| Columbus | 31,802 | 37,198 | 8.6 |
| Geneva | 1,280 | 1,331 | 2.5 |
| Glenwood | 285 | 280 | -1.8 |
| Hope | 2,171 | 2,204 | 0.5 |
| Lewisville | 437 | 469 | 2.9 |
| Mooreland | 465 | 479 | 3 |
| Rushville | 5,533 | 5,965 | -1.3 |
| St. Paul | 1,032 | 1,161 | 9.7 |
| Shelbyville | 15,336 | 17,397 | 9.7 |

* IBRC 1997

## 2.3 Agricultural Activities in the Flatrock-Haw Creek Watershed

Agriculture is the dominant land use in the Flatrock-Haw Creek Watershed. Section 2.2.1 shows that 89.8 percent of land cover in the watershed is agricultural vegetation. This section provides an overview of the agricultural activities in the watershed.

### *2.3.1 Livestock Operations*

Livestock production within the watershed encompasses several species, and the overall composition changes from county to county. Hogs, cattle, sheep, and horses are produced in almost every county, see Table 2-3 for livestock inventory numbers. Some animals are raised in open lots or pastures and some are raised in confined feeding lots or buildings.

Confined feeding is the raising of animals for food, fur or recreation in lots, pens, ponds, sheds or buildings, where they are confined, fed and maintained for at least 45 days during any year, and where there is no ground cover or vegetation present over at least half of the animals' confinement area. Livestock markets and sale barns are generally excluded (IDEM 1999).

Indiana law defines a confined feeding operation as any livestock operation engaged in the confined feeding of at least 300 cattle, or 600 swine or sheep, or 30,000 fowl, such as chickens, ducks and other poultry. The IDEM regulates these confined feeding operations, as well as smaller livestock operations which have violated water pollution rules or laws, under IC 13-18-10.

As of October 1999, there were 299 livestock producers operating under the Confined Feeding Rules in the six counties of the watershed (IDEM 1999). Tables 2-3 show livestock numbers from the USDA Agricultural Census (USDA-NASS 1997) “inventory” animals in each county.

## TABLE 2-3
## LIVESTOCK IN THE FLATROCK-HAW CREEK WATERSHED

| | 1997 Livestock Inventory* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hogs and pigs | | Cattle and calves | | Sheep and lamb | | Horse and pony | |
| County | Number | State Rank** | Number | State Rank** | Number | State Rank** | Number | State Rank** |
| Bartholomew | 24,052 | 56 | 6,736 | 58 | 609 | 37 | 616 | 21 |
| Decatur | 147,844 | 4 | 16,193 | 16 | 591 | 39 | 382 | 48 |
| Fayette | 24,878 | 52 | 9,201 | 41 | 460 | 49 | 212 | 77 |
| Henry | 18,097 | 61 | 11,078 | 30 | 1,076 | 13 | 507 | 35 |
| Rush | 109,134 | 8 | 14,194 | 22 | 634 | 36 | 535 | 34 |
| Shelby | 63,453 | 23 | 6,283 | 63 | 677 | 32 | 315 | 59 |

* USDA-NASS 1997

@ indicates specie is not in the top 4 for this county

** State Rank is out of a total of 92 counties in Indiana

D Numbers not disclosed by USDA-NASS

### *2.3.2 Crop Production*

As discussed previously, the soils of the Flatrock-Haw Creek watershed are good for crop production. Table 2-4 lists the 1997 acres of the major crops produced in 1997 throughout the six counties in the watershed. For 1997, total acres of corn for grain edged out total acres of soybeans for beans as the number one crop produced in the six counties. Corn and soybeans are clearly the primary crops produced in the watershed on basis of total acres.

**TABLE 2-4**
**CROPS PRODUCED IN THE FLATROCK-HAW CREEK WATERSHED**

| | 1997 Crops* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Corn for grain | | Soybeans for beans | | Wheat | | Hay crops | |
| County | Acres | State Rank** | Acres | State Rank** | Acres | State Rank** | Acres | State Rank** |
| Bartholomew | 67,794 | 39 | 58,378 | 41 | 7,670 | 19 | 5,271 | 52 |
| Decatur | 83,777 | 22 | 62,057 | 39 | 9,023 | 13 | 5,393 | 51 |
| Fayette | 38,122 | 65 | 29,014 | 71 | 4,237 | 47 | 5,517 | 48 |
| Henry | 70,172 | 34 | 70,678 | 30 | 3,091 | 69 | 6,674 | 36 |
| Rush | 95,585 | 14 | 88,600 | 13 | 7,884 | 17 | 6,007 | 42 |
| Shelby | 92,051 | 17 | 78,870 | 20 | 6,710 | 23 | 3,784 | 67 |

* USDA-NASS 1997

** State Rank is out of a total of 92 counties in Indiana

@ indicates specie is not in the top 4 for this county

## 2.4 Significant Natural Areas in the Flatrock-Haw Creek Watershed

In 1993, the Indiana Natural Resources Commission (NRC) adopted its “Outstanding Rivers” List for Indiana. This listing is referenced in the standards for utility line crossings within floodways, formerly governed by IC 14-28-2 and now controlled by 310 IAC 6-1-16 through 310 IAC 6-1-18. Except where incorporated into a statute or rule, the "Outstanding Rivers List" is intended to provide guidance rather than to have regulatory application (NRC 1997). To help identify the rivers and streams which have particular environmental or aesthetic interest, a special listing has been prepared by IDNR's Division of Outdoor Recreation. This listing is a corrected and condensed version of a list compiled by American Rivers and dated October 1990. The NRC has adopted the IDNR listing as an official recognition of the resource values of these waters. A river included in the "Outstanding Rivers List" qualifies under one or more of 22 categories. Table 2-5 presents the rivers in the Flatrock-Haw Creek watershed which are on the "Outstanding Rivers List" and their significance.

**TABLE 2-5**
**WATERS OF THE FLATROCK-HAW CREEK WATERSHED ON THE OUTSTANDING RIVERS LIST FOR INDIANA***

| River Segment | County | Significance |
|---|---|---|
| **Flatrock River:** S.R. 9 to East Fork White River | Bartholomew, Shelby | 13 |

**Significance of numbering system:**

13. Canoe Trails. State-designated canoe/boating routes.

*NRC 1997

## 2.5 Surface Water Use Designations and Classifications

The following uses are designated by the Indiana Water Pollution Control Board (327 IAC 2-1-3):

- Surface waters of the state are designated for full-body contact recreation during the recreational season (April through October).
- All waters, except limited use waters, will be capable of supporting a well-balanced, warm water aquatic community.
- All waters, which are used for public or industrial water supply, must meet the standards for those uses at the point where water is withdrawn.
- All waters, which are used for agricultural purposes, must meet minimum surface water quality standards.
- All waters in which naturally poor physical characteristics (including lack of sufficient flow), naturally poor or reversible man-induced conditions, which came into existence prior to January 1, 1983, and having been established by use attainability analysis, public comment period, and hearing may qualify to be classified for limited use and must be evaluated for restoration and upgrading at each triennial review of this rule.
- All waters, which provide unusual aquatic habitat, which are an integral feature of an area of exceptional natural beauty or character, or which support unique assemblages of aquatic organisms may be classified for exceptional use.

All waters of the state, at all times and at all places, including the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil, or scum attributable to municipal, industrial, agricultural, and other land use practices, or other discharges:

- that will settle to form putrescent or otherwise objectionable deposits,
- that are in amounts sufficient to be unsightly or deleterious,
- that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance,
- which are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans, or

- which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such degree as to create a nuisance, be unsightly, or otherwise impair designated uses.

### *2.5.1 Surface Water Classifications in the Flatrock-Haw Creek Watershed*

The statewide classifications discussed in Section 2.5 apply to all stream segments in the Flatrock-Haw Creek watershed.

## 2.6 US Geological Survey Water Use Information for the Flatrock-Haw Creek Watershed

The U.S. Geological Survey's (USGS) National Water-Use Information Program is responsible for compiling and disseminating the nation's water-use data. The USGS works in cooperation with local, State, and Federal environmental agencies to collect water-use information at a site-specific level. USGS also compiles the data from hundreds of thousands of sites to produce water-use information aggregated up to the county, state, and national levels. Every five years, data at the state and hydrologic region level are compiled into a national water-use data system. Table 2-6 shows the USGS Water-Use information for the Flatrock-Haw Creek Watershed for 1995.

## TABLE 2-6
## 1995 Water Use Information for the Flatrock-Haw Creek Watershed

| Population and Water Use totals | 1995 |
|---|---|
| Total population in the watershed (thousands) | 66.08 |
| **Public Water Supply** | **1995** |
| Population served by public groundwater supply (thousands) | 38.78 |
| Population served by surface water supply (thousands) | 0.68 |
| Total population served by public water supply (thousands) | 39.46 |
| Total groundwater withdrawals (mgd) | 2.87 |
| Total surface water withdrawals (mgd) | 0 |
| Total water withdrawals (mgd) | 2.87 |
| Total per capita withdrawal (gal/day) | 72.73 |
| Population self-supplied with water (thousands) | 26.62 |
| **Commercial Water Use** | **1995** |
| Groundwater withdrawal for commercial use (mgd) | 0.02 |
| Surface water withdrawal for commercial use (mgd) | 0.02 |
| Deliveries from public water supplies for commercial use (mgd) | 0.87 |
| Total commercial water use (mgd) | 0.91 |
| **Industrial Water Use** | **1995** |
| Groundwater withdrawal for industrial use (mgd) | 1.87 |
| Surface water withdrawals for industrial use (mgd) | 0 |
| Deliveries from public water suppliers for industrial use (mgd) | 3.13 |
| Total industrial water use (mgd) | 5.00 |
| **Agricultural Water Use** | **1995** |
| Groundwater withdrawals for livestock use (mgd) | 0.56 |
| Surface water withdrawals for livestock use (mgd) | 0.29 |
| Total livestock water use (mgd) | .85 |
| Groundwater withdrawals for irrigation (mgd) | 1.51 |
| Surface water withdrawals for irrigation (mgd) | 0.19 |
| Total irrigation water use (mgd) | 1.7 |

**Notes:**

mgd million gallon per day
gal/day gallon per day

- The water-use information presented in this table was compiled from information provided in the U.S. Geological Survey's National Water-Use Information Program data system for 1990 and 1995. The National Water-Use Information Program is responsible for compiling and disseminating the nation's water-use data. The U.S. Geological Survey works in cooperation with local, State, and Federal environmental agencies to collect water-use information at a site-specific level. Every five years, the U.S. Geological Survey compiles data at the state and hydrologic region level into a national water-use data system and are published in a national circular.

# 3 Causes and Sources of Water Pollution

A number of substances including nutrients, bacteria, oxygen-demanding wastes, metals, and toxic substances, cause water pollution. Sources of these pollution-causing substances are divided into two broad categories: point sources and nonpoint sources. Point sources are typically piped discharges from wastewater treatment plants, large urban and industrial stormwater systems, and other facilities. Nonpoint sources can include atmospheric deposition, groundwater inputs, and runoff from urban areas, agricultural lands and others. Chapter 3 includes the following:

Section 3.1 Causes of Pollution
Section 3.2 Point Sources of Pollution
Section 3.3 Nonpoint Sources of Pollution

## 3.1 Causes of Pollution

'Causes of pollution' refer to the substances which enter surface waters from point and nonpoint sources and result in water quality degradation and impairment. Major causes of water quality impairment include biochemical oxygen demand (BOD), nutrients, toxicants (such as heavy metals, polychlorinated biphenyls [PCBs], chlorine, pH and ammonia) and E. coli bacteria. Table 3-1 provides a general overview of causes of impairment and the activities that may lead to their introduction into surface waters. Each of these causes is discussed in the following sections.

**TABLE 3-1**
**CAUSES OF WATER POLLUTION AND CONTRIBUTING ACTIVITIES**

| Cause | Activity associated with cause |
|---|---|
| **Nutrients** | Fertilizer on agricultural crops and residential/ commercial lawns, animal wastes, leaky sewers and septic tanks, direct septic discharge, atmospheric deposition, wastewater treatment plants |
| **Toxic Chemicals** | Pesticide applications, disinfectants, automobile fluids, accidental spills, illegal dumping, urban stormwater runoff, direct septic discharge, industrial effluent |
| **Oxygen-Consuming Substances** | Wastewater effluent, leaking sewers and septic tanks, direct septic discharge, animal waste |
| **E. coli** | Failing septic systems, direct septic discharge, animal waste (including runoff from livestock operations and impacts from wildlife), improperly disinfected wastewater treatment plant effluent |

### *3.1.1 E. coli Bacteria*

*E. coli* bacteria are associated with the intestinal tract of warm-blooded animals. They are widely used as an indicator of the potential presence of waterborne disease-causing (pathogenic) bacteria, protozoa, and viruses because they are easier and less costly to detect than the actual pathogenic organisms. The presence of waterborne disease-causing organisms can lead to outbreaks of such diseases as typhoid fever, dysentery, cholera, and cryptosporidiosis. The detection and identification of specific bacteria, viruses, and protozoa, (such as Giardia, Cryptosporidium, and Shigella) require special sampling protocols and very sophisticated laboratory techniques which are not commonly available.

*E. coli* water quality standards have been established in order to ensure safe use of waters for water supplies and recreation. 327 IAC 2-1-6 Section 6(d) states that *E. coli* bacteria, using membrane filter count (MF), shall not exceed 125 per 100 milliliters as a geometric mean based on not less than five samples equally spaced over a 30 day period nor exceed 235 per 100 milliliters in any one sample in a 30 day period.

*E. coli* bacteria may enter surface waters from nonpoint source runoff, but they also come from improperly treated discharges of domestic wastewater. Common potential sources of *E. coli* bacteria include leaking or failing septic systems, direct septic discharge, leaking sewer lines or pump station overflows, runoff from livestock operations, urban stormwater and wildlife. *E. coli* bacteria in treatment plant effluent are controlled through disinfection methods including chlorination (often followed by dechlorination), ozonation or ultraviolet light radiation.

### *3.1.2 Toxic Substances*

327 IAC 2-1-9(45) defines toxic substances as substances, which are or may become harmful to plant or animal life, or to food chains when present in sufficient concentrations or combinations. Toxic substances include, but are not limited to, those pollutants identified as toxic under Section 307 (a)(1) of the Clean Water Act. Standards for individual toxic substances are listed 327 IAC 2-1-6. Toxic substances frequently encountered include chlorine, ammonia, organics (hydrocarbons and pesticides) heavy metals and pH. These materials are toxic to different organisms in varying amounts, and the effects may be evident immediately or may only be manifested after long-term exposure or accumulation in living tissue.

Whole effluent toxicity testing is required for major NPDES dischargers (discharge over 1 million gallons per day or population greater than 10,000). This test shows whether the effluent from a treatment plant is toxic, but it does not identify the specific cause of toxicity. If the effluent is found to be toxic, further testing is done to determine the specific cause. This follow-up testing is called a toxicity reduction evaluation. Other testing, or monitoring, done to detect aquatic toxicity problems include fish tissue analyses, chemical water quality sampling and assessment of fish community and bottom-dwelling organisms such as aquatic insect larvae. These monitoring programs are discussed in Chapter 4.

Each of the substances below can be toxic in sufficient quantity or concentration.

<u>Metals</u>

Municipal and industrial dischargers and urban runoff are the main sources of metal contamination in surface water. Indiana has stream standards for many heavy metals, but the

most common ones in municipal permits are cadmium, chromium, copper, nickel, lead, mercury, and zinc. Standards are listed in 327 IAC 2-1-6. Point source discharges of metals are controlled through the National Pollution Discharge Elimination System (NPDES) permit process. Mass balance models are employed to determine allowable concentrations for a permit limit. Municipalities with significant industrial users discharging wastes to their treatment facilities limit the heavy metals from these industries through a pretreatment program. Source reduction and wastewater recycling at waste water treatment plants (WWTP) also reduces the amount of metals being discharged to a stream. Nonpoint sources of pollution are controlled through best management practices.

In Indiana, as well as many other areas of the country, mercury contamination in fish has caused the need to post widespread fish consumption advisories. The source of the mercury is unclear; however, atmospheric sources are suspected and are currently being studied.

Polychlorinated biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) were first created in 1881 and subsequently began to be commercially manufactured around 1929 (Bunce 1994). Because of their fire-resistant and insulating properties, PCBs were widely used in transformers, capacitors, and in hydraulic and heat transfer systems. In addition, PCBs were used in products such as plasticizers, rubber, ink, and wax. In 1966, PCBs were first detected in wildlife, and were soon found to be ubiquitous in the environment (Bunce 1994). PCBs entered the environment through unregulated disposal of products such as waste oils, transformers, capacitors, sealants, paints, and carbonless copy paper. In 1977, production of PCBs in North America was halted. Subsequently, the PCB contamination present in our surface waters and environment today is the result of historical waste disposal practices.

Ammonia ($NH_3$)

Point source dischargers are one of the major sources of ammonia. In addition, discharge of untreated septic effluent, decaying organisms which may come from nonpoint source runoff and bacterial decomposition of animal waste also contribute to the level of ammonia in a waterbody. Standards for ammonia are listed in 327 IAC 2-1-6.

### *3.1.3 Oxygen-Consuming Wastes*

Oxygen-consuming wastes include decomposing organic matter or chemicals, which reduce dissolved oxygen in water through chemical reactions. Raw domestic wastewater contains high concentrations of oxygen-consuming wastes that need to be removed from the wastewater before it can be discharged into a waterway. Maintaining a sufficient level of dissolved oxygen in the water is critical to most forms of aquatic life.

The concentration of dissolved oxygen in a water body is one indicator of the general health of an aquatic ecosystem. 327 IAC Section 6 (b)(3) states that concentrations of dissolved oxygen shall average at least five milligrams per liter per calendar day and shall not be less than four milligrams per liter at any time. Dissolved oxygen concentrations are affected by a number of factors. Higher dissolved oxygen is produced by turbulent actions, such as waves, which mix air and water. Lower water temperatures also generally allows for retention of higher dissolved oxygen concentrations. Low dissolved oxygen levels tend to occur more often in warmer,

slow-moving waters. In general, the lowest dissolved oxygen concentrations occur during the warmest summer months and particularly during low flow periods.

Sources of dissolved oxygen depletion include wastewater treatment plant effluent, the decomposition of organic matter (such as leaves, dead plants and animals) and organic waste matter that is washed or discharged into the water. Sewage from human and household wastes is high in organic waste matter. Bacterial decomposition can rapidly deplete dissolved oxygen levels unless these wastes are adequately treated at a wastewater treatment plant. In addition, excess nutrients in a water body may lead to an over-abundance of algae and reduce dissolved oxygen in the water through algal respiration and decomposition of dead algae. Also, some chemicals may react with and bind up dissolved oxygen. Industrial discharges with oxygen consuming wasteflow may be resilient instream and continue to use oxygen for a long distance downstream.

### *3.1.4 Nutrients*

The term "nutrients" in this Strategy refers to two major plant nutrients, phosphorus and nitrogen. These are common components of fertilizers, animal and human wastes, vegetation, and some industrial processes. Nutrients in surface waters come from both point and nonpoint sources. Nutrients are beneficial to aquatic life in small amounts. However, in over-abundance and under favorable conditions, they can stimulate the occurrence of algal blooms and excessive plant growth in quiet waters or low flow conditions. The algal blooms and excessive plant growth often reduce the dissolved oxygen content of surface waters through plant respiration and decomposition of dead algae and other plants. This is accentuated in hot weather and low flow conditions because of the reduced capacity of the water to retain dissolved oxygen.

## 3.2 Point Sources of Pollution

As discussed previously, sources of water pollution are divided into two broad categories: point sources and nonpoint sources. This section focuses on point sources. Section 3.3.1 defines point sources and Section 3.3.2 discusses point sources in the Flatrock-Haw Creek Watershed.

### *3.2.1 Defining Point Sources*

Point sources refer to discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge. The term applies to wastewater and stormwater discharges from a variety of sources. Wastewater point source discharges include municipal (city and county) and industrial wastewater treatment plants and small domestic wastewater treatment systems that may serve schools, commercial offices, residential subdivisions and individual homes. Stormwater point source discharges include stormwater collection systems for medium and large municipalities which serve populations greater than 100,000 and stormwater discharges associated with industrial activity as defined in the Code of Federal Regulations (40 CFR 122.26(a)(14)). The primary pollutants associated with point source discharges are Oxygen demanding wastes, nutrients, sediment, color and toxic substances including chlorine, ammonia and metals.

Point source dischargers in Indiana must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit from the state. Discharge permits are issued under the NPDES program, which is delegated to Indiana by the US Environmental Protection Agency (EPA). See Chapter 5 for a description of the NPDES program and permitting strategies.

### *3.2.2 Point Source Discharges in the Flatrock-Haw Creek Watershed*

As of June 1999, there were 45 active NPDES permits within the Flatrock-Haw Creek watershed (Table 3-2, Figure 3-1). Three of the 45 active NPDES permits are for major discharges (see Table 5-1 for a definition of a major discharge).

Another point source covered by NPDES permits is combined sewer overflows (CSO). A combined sewer system is a wastewater collection system that conveys sanitary wastewater (domestic, commercial and industrial wastewater) and stormwater through a single-pipe system to a Publicly Owned Treatment Works. A CSO is the discharge from a combined sewer system at a point prior to the Publicly Owned Treatment Works. CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the Clean Water Act.

| **Community** | **CSO Outfalls** |
|---|---|
| Columbus | 3 |
| Rushville | 3 |

In addition to the NPDES permitted dischargers in the watershed, there may be many unpermitted, illegal discharges to the Flatrock-Haw Creek system. Illegal discharges of residential wastewater (septic tank effluent) to streams and ditches from straight pipe discharges and old inadequate systems are a problem within the watershed.

## Table 3-2
## NPDES PERMITTED FACILITIES
## FLATROCK-HAW CREEK WATERSHED

| NPDES | Facility Name | Maj/Mi | City | County | Status |
|---|---|---|---|---|---|
| ING080018 | VILLIAGE PANTRY STORE #536 | ACTIVE | RUSHVILLE | RUSH | MINOR |
| ING080039 | GARDEN CITY SAVE | ACTIVE | COLUMBUS | BARTHOLO | MINOR |
| ING490008 | NEW POINT STONE, ST. PAUL | ACTIVE | ST. PAUL | DECATUR | MINOR |
| ING490036 | RUSH COUNTY STONE | ACTIVE | MILROY, | RUSH | MINOR |
| INL020842 | SAINT PAUL MUNICIPAL STP | ACTIVE | | DECATUR | MINOR |
| INL021270 | RUSHVILLE MUNICIPAL STP | ACTIVE | | RUSH | MINOR |
| INL024783 | WALDRON CONSERVANCY | ACTIVE | | SHELBY | MINOR |
| INL032573 | COLUMBUS MUNICIPAL STP | ACTIVE | | BARTHOLO | MINOR |
| INL037371 | TRI HIGH SCHOOL | ACTIVE | | HENRY | MINOR |
| INL040398 | MOORELAND MUNICIPAL STP | ACTIVE | | HENRY | MINOR |
| INL042366 | PRINCES LAKE MUNICIPAL STP | ACTIVE | | JOHNSON | MINOR |
| INL055131 | SOUTH HENRY REGIONAL | ACTIVE | | HENRY | MINOR |
| INP000060 | COPELAND CORPORATION | INACTIVE | RUSHVILLE | RUSH | MINOR |
| IN0002046 | MESHBERGER STONE, FLAT | ACTIVE | FLAT ROCK, | SHELBY | MINOR |
| IN0004154 | COLUMBUS FILTRATION | INACTIVE | | BARTHOLO | MINOR |
| IN0004197 | COSCO, INC. | INACTIVE | COLUMBUS | BARTHOLO | MINOR |
| IN0004260 | ST. PAUL STONE COMPANY | INACTIVE | SAINT PAUL | DECATUR | MINOR |
| IN0004669 | INDUSTRIAL LIQUID WASTE - | INACTIVE | | BARTHOLO | MAJOR |
| IN0004821 | MILROY CANNING COMPANY, | ACTIVE | MILROY | RUSH | MINOR |
| IN0021253 | HOPE MUNICIPAL STP | ACTIVE | HOPE | BARTHOLO | MINOR |
| IN0021270 | RUSHVILLE MUNICIPAL STP | ACTIVE | RUSHVILLE | RUSH | MAJOR |
| IN0024783 | WALDRON CONSERVANCY | ACTIVE | WALDRON | SHELBY | MINOR |
| IN0031551 | CROSS CLIFF ELEM. SCHOOL | ACTIVE | CLIFFORD | BARTHOLO | MINOR |
| IN0032361 | EASTERN BARTHOLOMEW | INACTIVE | | BARTHOLO | MINOR |
| IN0032573 | COLUMBUS MUNICIPAL STP | ACTIVE | COLUMBUS | BARTHOLO | MAJOR |
| IN0032590 | RUSH CNTY STONE COMPANY, | INACTIVE | MILROY, | RUSH | MINOR |
| IN0035092 | MAPLE LEAF FARMS INC-C | INACTIVE | | DECATUR | MINOR |
| IN0035106 | MAPLE LEAF FARMS INC-WM E | INACTIVE | | DECATUR | MINOR |
| IN0035122 | MAPLE LEAF FARMS INC- | INACTIVE | | DECATUR | MINOR |
| IN0035131 | MAPLE LEAF FARMS INC-J D | INACTIVE | | DECATUR | MINOR |
| IN0035211 | ST PAUL QUARRIES INC | INACTIVE | | DECATUR | MINOR |
| IN0037371 | TRI HIGH SCHOOL | INACTIVE | STRAUGHN | HENRY | MINOR |
| IN0038008 | STADLER PACKING CO INC | INACTIVE | | BARTHOLO | MINOR |
| IN0039632 | SHADY CREEK MOBILE HOME | ACTIVE | SHELBYVILLE | SHELBY | MINOR |
| IN0040266 | LEWISVILLE MUNICIPAL STP | INACTIVE | | HENRY | MINOR |
| IN0040398 | MOORELAND MUNICIPAL STP | ACTIVE | MOORELAND | HENRY | MINOR |
| IN0041777 | COLUMBUS YOUTH CAMP | ACTIVE | COLUMBUS | BARTHOLO | MINOR |
| IN0042773 | RUSHVILLE PUBLIC WATER | ACTIVE | RUSHVILLE | RUSH | MINOR |
| IN0043800 | MILROY UTILITIES CORP PWS | INACTIVE | MILROY | RUSH | MINOR |
| IN0044300 | MESHBERGER STONE INC | INACTIVE | | BARTHOLO | MINOR |
| IN0044903 | MCMILLIN PACKING CO INC | INACTIVE | | RUSH | MINOR |
| IN0045748 | WOOD PRODUCTS LLP WWTP | ACTIVE | HOPE | BARTHOLO | MINOR |
| IN0049166 | GLENWOOD WATER WORKS | ACTIVE | GLENWOOD | FAYETTE | MINOR |
| IN0049921 | SHELBY COUNTY MANOR | INACTIVE | SHELBYVILLE | SHELBY | MINOR |
| IN0053546 | SOUTHWESTERN ELEM & HIGH | ACTIVE | SHELBYVILLE | SHELBY | MINOR |
| IN0055131 | SOUTH HENRY REGIONAL | ACTIVE | LEWISVILLE | HENRY | MINOR |
| IN0056448 | CUMMINS ENGINE COMPANY, | ACTIVE | COLUMBUS | BARTHOLO | MINOR |
| IN0109746 | ANDERSON TOWNSHIP RSD | ACTIVE | MILROY | RUSH | MINOR |

## 3.3 Nonpoint Sources of Pollution

Nonpoint source pollution refers to runoff that enters surface waters through stormwater runoff, contaminated ground water, snowmelt or atmospheric deposition. There are many types of land use activities that can serve as sources of nonpoint source pollution including land development, construction, mining operations, crop production, animal feeding lots, timber harvesting, failing septic systems, landfills, roads and paved areas. Stormwater from large urban areas (greater than 100,000 people) and from certain industrial and construction sites is technically considered a point source since NPDES permits are required for discharges of stormwater from these areas.

Sediment and nutrients are major pollution causing substances associated with nonpoint source pollution. Others include *E. coli* bacteria, heavy metals, pesticides, oil and grease, and any other substance that may be washed off the ground or removed from the atmosphere and carried into surface waters. Unlike point source pollution, nonpoint pollution sources are diffuse in nature and occur at random time intervals depending on rainfall events. Below is a brief description of major areas of nonpoint sources of pollution in the Flatrock-Haw Creek watershed.

### *3.3.1 Agriculture*

There are a number of activities associated with agriculture that can serve as potential sources of water pollution. Land clearing and tilling make soils susceptible to erosion, which can then cause stream sedimentation. Pesticides and fertilizers (including synthetic fertilizers and animal wastes) can be washed from fields or improperly designed storage or disposal sites. Construction of drainage ditches on poorly drained soils enhances the movement of oxygen consuming wastes, sediment and soluble nutrients into groundwater and surface waters.

Concentrated animal operations can be a significant source of nutrients, biochemical oxygen demand and *E. coli* bacteria if wastes are not properly managed. Impacts can result from over application of wastes to fields, from leaking lagoons and from flows of lagoon liquids to surface waters due to improper waste lagoon management. Also there are potential concerns associated with nitrate-nitrogen movement through the soil from poorly constructed lagoons and from wastes applied to the soil surface.

Grassed waterways, conservation tillage, and no-till practices are several common practices used by many farmers to minimize soil loss. Maintaining a vegetated buffer between fields and streams is another excellent way to minimize sediment and nutrient loads to streams.

### *3.3.2 Urban/Residential*

Runoff from urbanized areas, as a rule, is more localized and can often be more severe in magnitude than agricultural runoff. Any type of land-disturbing activity such as land clearing or excavation can result in soil loss and sedimentation. The rate and volume of runoff in urban areas is much greater due both to the high concentration of impervious surface areas and to storm drainage systems that rapidly transport stormwater to nearby surface waters. This increase in volume and rate of runoff can result in streambank erosion and sedimentation in surface waters.

Urban drainage systems, including curb and guttered roadways, also allow urban pollutants to reach surface waters quickly and with little or no filtering. Pollutants include lawn care pesticides and fertilizers; automobile fluids; lawn and household wastes; road salts, and E. coli bacteria (from animals and failing septic systems). The diversity of these pollutants makes it very challenging to attribute water quality degradation to any one pollutant.

Replacement of natural vegetation with pavement and removal of buffers reduces the ability of the watershed to filter pollutants before they enter surface waters. The chronic introduction of these pollutants and increased flow and velocity into a stream results in degraded waters. Many waters adjacent to urban areas are rated as biologically poor. This degradation also exists in lakes, which have been heavily influenced by adjacent urban development.

The population figures discussed in Section 2.3.2 are good indicators of where urban development and potential urban water quality impacts are likely to occur. Concentrated areas where urban development is high may lead to further water quality problems associated with the addition of impervious surfaces next to surface waters.

### *3.3.3 Onsite Wastewater Disposal*

Septic systems contain all of the wastewater from a household or business. A complete septic system consists of a septic tank and an absorption field to receive effluent from the septic tank. The septic tank removes some wastes, but the soil absorption field provides further absorption and treatment. Septic systems can be a safe and effective method for treating wastewater if they are sized, sited, and maintained properly. However, if the tank or absorption field malfunction or are improperly placed, constructed or maintained, nearby wells and surface waters may become contaminated.

Some of the potential problems from malfunctioning septic systems include:

- Polluted groundwater: Pollutants in septic effluent include bacteria, nutrients, toxic substances, and oxygen-consuming wastes. Nearby wells can become contaminated by failing septic systems.

- Polluted surface water: Groundwater often carries the pollutants mentioned above into surface waters, where they can cause serious harm to aquatic ecosystems. Leaking septic tanks can also leak into surface waters through or over the soil. In addition, some septic tanks may directly discharge to surface waters.

- Risks to human health: Septic system malfunctions can endanger human health when they contaminate nearby wells, drinking water supplies, and fishing and swimming areas.

Pollutants associated with onsite wastewater disposal may also be discharged directly to surface waters through direct pipe connections between the septic system and surface waters (straight pipe discharge). However, 327 IAC 5-1-1.5 specifically states that “point source discharge of sewage treated or untreated, from a dwelling or its associated residential sewage disposal system, to the waters of the state is prohibited”.

### *3.3.4 Construction*

Construction activities that involve excavation, grading or filling can produce significant sedimentation if not properly controlled. Sedimentation from developing urban areas can be a major source of pollution due to the cumulative number of acres disturbed in a watershed. Construction of single family homes in rural areas can also be a source of sedimentation when homes are placed in or near stream corridors.

As a pollution source, construction activities are typically temporary, but the impacts on water quality can be severe and long lasting. Construction activities tend to be concentrated in the more rapidly developing areas of the watershed.

# 4. Water Quality and Use Support Ratings in the Flatrock-Haw Creek Watershed

This section provides a detailed overview of water quality monitoring, water quality, and use support ratings in the Flatrock-Haw Creek watershed and includes the following:



## 4.1 Water Quality Monitoring Programs

This section discusses water quality monitoring programs. Specifically, Section 4.1.1 describes IDEM's Office of Water Management monitoring programs and Section 4.1.2 discusses other monitoring efforts in the watershed.

### *4.1.1 Office of Water Management Programs*

The Water Quality Assessment Branch of the Office of Water Management is responsible for assessing the quality of water in Indiana's lakes, rivers and streams. This assessment is performed by field staff from the Survey Section and the Biological Studies Section. Virtually every element of IDEM's surface water quality management program of IDEM is directly or indirectly related to activities currently carried out by this Branch. The biological and surface water monitoring activities identify stream reaches, watersheds or segments where physical, chemical and/or biological quality has been or would be impaired by either point or nonpoint sources. This information is used to help allocate waste loads equitably among various sources in a way that would ensure that water quality standards are met along stream reaches in each of the nearly 100 stream segments in Indiana.

The purpose of the Surveys Section is to provide the water quality and hydrological data required for the assessment of Indiana's waters by conducting Watershed/Basin Surveys and Stream Reach Surveys. In 1996, the Section began a five-year synoptic study (Basin Monitoring Strategy) of the State's ten major watersheds. Information from these studies will be integrated with data from biological and nonpoint source studies as well as the Fixed Station Monitoring Program to make a major assessment of the State's waters. Such surveys determine the extent to which water quality standards are being met and whether the fishable, swimmable and water supply uses are being maintained.

Information derived from this strategy will contribute significantly to improved planning processes throughout the Office of Water Management. This plan should initiate the development of interrelated action plans, which encompass the wide range of responsibilities,

such as rule making, permitting, compliance, nonpoint source issues, and wastewater treatment facility oversight.

The Biological Studies Section conducts studies of fish and macroinvertebrate communities as well as stream habitats to establish biological conditions to which other streams may be compared in order to identify impaired streams or watersheds. The Biological Studies Section also conducts fish tissue and sediment sampling to pinpoint sources of toxic and bioconcentrating substances. Fish tissue data serve as the basis for fish consumption advisories, which are issued, through the Indiana State Department of Health, to protect the health of Indiana citizens. This Section also participates in the development of site-specific water quality standards.

The Biological Studies Section relies on the Volunteer Water Quality Monitoring Programs to provide additional data on lakes and wetlands that may not be sampling sites in the Monitoring Strategy. Volunteer collected data provides IDEM scientists with an overall view of water quality trends and early warning of problems that may be occurring in a lake or wetland. If volunteers detect that a lake or wetland is severely degraded, professional IDEM scientists will conduct follow up investigation.

## 4.2 Summary of Ambient Monitoring Data for the Flatrock-Haw Creek Watershed

The fixed station-monitoring program managed by IDEM's Office of Water Management has been monitoring surface water chemistry throughout the state since 1957. The data set from 1986 to 1995 was analyzed using the Seasonal Kendall test. This test deduces if a statistical change in the surface water chemistry occurred over a time period. The results of the Seasonal Kendall analysis for stations located in the Flatrock-Haw Creek watershed are provided in Table 4-1. The data collected from 1991 to 1997 from this monitoring program was also analyzed to determine benchmark characteristics. The results of the benchmark characteristic analysis for stations located in the Flatrock-Haw Creek watershed are provided in Appendix B. For a more in depth discussion of this analysis, please refer to the Indiana Fixed Station Statistical Analysis 1997 (IDEM 32/02/005/1998), published in May 1998 by the Assessment Branch of the Office of Water Management - IDEM.

## TABLE 4-1
## RESULTS OF SEASONAL KENDALL ANALYSIS FOR STATIONS LOCATED IN THE FLATROCK-HAW CREEK WATERSHED 1986 TO 1995

| Parameter | EW-239<br>East Fork, White River<br>SR 46 Bridge Columbus |
|---|---|
| Biological Oxygen Demand | ↓ |
| Chemical Oxygen Demand | ↗ |
| Dissolved Oxygen | « |
| E. coli | « |
| Ammonia | « |
| Nitrite + Nitrate | ↓ |
| Total phosphorus | ↑ |
| Total Residue | « |
| Total Residue, Filterable | ? |
| Total Residue, Nonfilterable | « |

Notes

« No Statistical Change; significance < 80% or reported slope = 0.00000

↓ Statistically Decreasing; significance >95% with a negative slope

↘ Potentially Decreasing; significance >80% with a negative slope

↗ Potentially Increasing; significance >80% with a positive slope

↑ Statistically Increasing; significance >95 % with a positive slope

? Insufficient Data for analysis

## 4.3 Fish Consumption Advisories

Since 1972, the Indiana Department of Natural Resources, the IDEM, and the Indiana State Department of Health (ISDH) have worked together to create the Indiana Fish Consumption Advisory. Each year members from these three agencies meet to discuss the findings of recent fish monitoring data and to develop the new statewide fish consumption advisory.

The 2000 advisory is based on levels of PCBs and mercury found in fish tissue. Fish are tested regularly only in areas where there is suspected contamination. In each area, samples were taken of bottom-feeding fish, top-feeding fish, and fish feeding in between. Over 1,600 fish tissue samples collected throughout the state were analyzed for PCBs, pesticides, and heavy metals. Of those samples, 99 percent contained mercury. Criteria for placing fish Indiana Fish Consumption Advisory have changed from using the Food and Drug Administration guidelines to using the Great Lakes Task Force risk-based approach.

The ISDH defines the Advisory Groups as follows:

| | |
|---|---|
| **Group 1** | Unrestricted consumption |
| **Group 2** | One meal per week (52 meals per year) for adult males and females. One meal per month for women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15. |
| **Group 3** | One meal per month (12 meals per year) for adult males and females. Women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15 do not eat. |
| **Group 4** | One meal every two months (six meals per year) for adult males and females. Women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15 do not eat. |
| **Group 5** | No consumption (DO NOT EAT) |

Carp generally are contaminated with both PCBs and mercury. Except as otherwise noted, carp in all Indiana rivers and streams fall under the following risk groups:

Carp, 15-20 inches - Group 3
Carp, 20-25 inches - Group 4
Carp over 25 inches - Group 5

In the Flatrock-Haw Creek Watershed, the following waterbodies are under the 2000 fish consumption advisory:

| Waterbody/County | Species | Size | Contaminant | Group |
|---|---|---|---|---|
| **East Fork - White River** | | | | |
| **Bartholomew** | Golden redhorse | 8-13" | PCB | 2 |
| | | >13" | PCB | 3 |
| | Silver redhorse | 16-18" | PCB | 3 |
| | | >18" | PCB | 4 |
| **Flatrock River/Rush** | Northern hogsucker | 8-13" | Mercury | 2 |
| | | >13" | Mercury | 3 |
| | Longear sunfish | 4-6" | Mercury | 2 |
| | | >6" | Mercury | 3 |
| | Rock bass | 5-8" | Mercury | 2 |
| | | >8" | Mercury | 3 |
| **Shelby** | Rock bass | 5-8" | PCB/Mercury | 2 |
| | | >8" | PCB/Mercury | 3 |

## 4.4 Clean Water Act Section 305(b) Report

Section 305(b) of the Clean Water Act requires states to prepare and submit to the EPA a water quality assessment report of state water resources. A new surface water monitoring strategy for the Office of Water Management was implemented in 1996 with the goal of monitoring all waters of the state by 2001 and reporting the assessments by 2003. Each year approximately 20 percent of the waterbodies in the state will be assessed and reported the following year. Appendix C contains the listing of the Flatrock-Haw Creek watershed waterbodies assessed, status of designated use support, probable causes of impairment, and stream miles affected. The methodologies of the Clean Water Act Section 305(b) assessment and use support ratings are discussed in Section 4.5.

## 4.5 Clean Water Act Section 305(b) Assessment and Use-Support: Methodology

The Office of Water Management determines use support status for each stream and waterbody in accordance with the assessment guidelines provided by EPA (1997). Results from four monitoring programs are integrated to provide an assessment for each stream and waterbody:

- Physical/chemical water column results,
- Benthic aquatic macroinvertebrate community assessments,
- Fish tissue and surficial aquatic sediment contaminant results, and
- *E. coli* monitoring results.

The assessment process was applied to each data sampling program. The individual assessments were integrated into an overall assessment for each waterbody by use designation: aquatic life support, fish consumption, and recreational use. River miles in a watershed appear as one waterbody while each lake in a watershed is reported as a separate waterbody.

Physical/chemical data for toxicants (total recoverable metals), conventional water chemistry parameters (dissolved oxygen, pH, and temperature), and bacteria (*E. coli*) were evaluated for exceedance of the Indiana Water Quality Standards (327 IAC 2-1-6). U.S. EPA 305(b) Guidelines were applied to sample results as indicated in Table 4-3 (U.S. EPA 1997b).

## TABLE 4-2
## CRITERIA FOR USE SUPPORT ASSESSMENT*

| Parameter | Fully Supporting | Partially Supporting | Not Supporting |
|---|---|---|---|
| **Aquatic Life Use Support** | | | |
| **Toxicants** | Metals were evaluated on a site by site basis and judged according to magnitude of exceedance and the number of times exceedances occurred. | | |
| **Conventional inorganics** | There were very few water quality violations, almost all of which were due to natural conditions. | | |
| **Benthic aquatic macroinvertebrate Index of Biotic Integrity (mIBI)** | mIBI $\geq$ 4. | mIBI $<$ 4 and $\geq$ 2. | mIBI $<$ 2. |
| **Qualitative habitat use evaluation (QHEI)** | QHEI $\geq$ 64. | QHEI $<$ 64 and $\geq$ 51. | QHEI $<$ 51. |
| **Fish community (fIBI) (Lower White River only)** | IBI $\geq$ 44. | IBI $<$ 44 and $\geq$ 22 | IBI $<$ 22. |
| **Sediment (PAHs = polynuclear aromatic hydrocarbons. AVS/SEM = acid volatile sulfide/ simultaneously extracted metals.)** | All PAHs $\leq$ 75$^{th}$ percentile. All AVS/SEMs $\leq$ 75$^{th}$ percentile. All other parameters $\leq$ 95$^{th}$ percentile. | PAHs or AVS/SEMs $>$ 75$^{th}$ percentile. (Includes Grand Calumet River and Indiana Harbor Canal sediment results, and so is a conservative number.) | Parameters $>$ 95$^{th}$percentile as derived from IDEM Sediment Contaminants Database. |
| **Indiana Trophic State Index (lakes only)** | Nutrients, dissolved oxygen, turbidity, algal growth, and sometimes pH were evaluated on a lake-by-lake basis. Each parameter judged according to magnitude. | | |
| **Fish Consumption** | | | |
| Fish tissue | No specific Advisory* | Limited Group 2 - 4 Advisory* | Group 5 Advisory* |
| * Indiana Fish Consumption Advisory, 1997, includes a state wide advisory for carp consumption. This was not included in individual waterbody reports because it obscures the magnitude of impairment caused by other parameters. | | | |
| **Recreational Use Support (Swimmable)** | | | |
| Bacteria (cfu = colony forming units.) | No more than one grab sample slightly $>$ 235 cfu/100ml, and geometric mean not exceeded. | No samples in this classification. | One or more grab sample exceeded 235 cfu/100ml, and geometric mean exceeded. |

*From Indiana Water Quality Report for 1998

# 5 State and Federal Water Programs

This Chapter summarizes the existing point and nonpoint source pollution control programs available for addressing water quality problems in the Flatrock-Haw Creek watershed. Chapter 5 includes:

Section 5.1 Indiana Department of Environmental Management Water Quality Programs
Section 5.2 Indiana Department of Natural Resources Water Programs
Section 5.3 USDA/Natural Resources Conservation Service Water Programs

## 5.1 Indiana Department of Environmental Management Water Quality Programs

This Section describes the water quality programs managed by the Office of Water Management within IDEM and includes:

Section 5.1.1 State and Federal Legislative Authorities for Indiana's Water Quality Program
Section 5.1.2 Indiana's Point Source Control Program
Section 5.1.3 Indiana's Nonpoint Source Control Programs
Section 5.1.4 Integrating Point and Nonpoint Source Pollution Control Strategies
Section 5.1.5 Potential Sources of Funding for Water Quality Projects

### *5.1.1 State and Federal Legislative Authorities for Indiana's Water Quality Program*

Authorities for some of the programs and responsibilities carried out by the Office of Water Management are derived from a number of federal and state legislative mandates outlined below. The major federal authorities for the state's water quality program are found in sections of the Clean Water Act. State authorities are from state statutes.

Federal Authorities for Indiana's Water Quality Program

- The Clean Water Act Section 301 - Prohibits the discharge of pollutants into surface waters unless permitted by EPA.
- The Clean Water Act Section 303(c) - States are responsible for reviewing, establishing and revising water quality standards for all surface waters.
- The Clean Water Act Section 303(d) - Each state shall identify waters within its boundaries for which the effluent limits required by 301(b)(1) A and B are not stringent enough to protect any water quality standards applicable to such waters.
- The Clean Water Act Section 305(b) - Each state is required to submit a biennial report to the EPA describing the status of surface waters in that state.
- The Clean Water Act Section 319 - Each state is required to develop and implement a nonpoint source pollution management program.

- The Clean Water Act Section 402 - Establishes the National Pollutant Discharge Elimination System (NPDES) permitting program. Allows for delegation of permitting authority to qualifying states (which Indiana has received).

- The Clean Water Act Section 404/401 - Section 404 regulates the discharge of dredge and fill materials into navigable waters and adjoining wetlands. Section 401 requires the U.S. Army Corps of Engineers to receive a state Water Quality Certification prior to issuance a 404 permit.

State Authorities for Indiana's Water Quality Program

IC 13-13-5 Designation of Department for Purposes of Federal Law: Designates the Indiana Department of Environmental Management as the water pollution agency for Indiana for all purposes of the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) effective January 1, 1988, and the federal Safe Drinking Water Act (42 U.S.C. 300f through 300j) effective January 1, 1988.

### 5.1.2 Indiana's Point Source Control Program

The State of Indiana's efforts to control the direct discharge of pollutants to waters of the State were inaugurated by the passage of the Stream Pollution Control Law of 1943. The vehicle currently used to control direct discharges to waters of the State is the NPDES (National Pollutant Discharge Elimination System) permit program. This was made possible by the passage of the Federal Water Pollution Control Act Amendments of 1972 (also referred to as the Clean Water Act). These permits place limits on the amount of pollutants that may be discharged to waters of the State by each discharger. These limits are set at levels protective of both the aquatic life in the waters which receive the discharge and human health.

The State of Indiana was granted primacy from U.S. EPA to issue NPDES permits on January 1, 1975 through a Memorandum of Agreement.

U.S. EPA, Region V, has oversight authority for the NPDES permits program. Under terms of the Memorandum of Agreement, Region V has the right to comment on all draft Major discharger permits. In addition to NPDES, the Office of Water Management Permits Section has a pretreatment group which regulates municipalities in their development of municipal pretreatment programs and indirect discharges, or those discharges of process wastewater to municipal sewage treatment plants through Industrial Waste Pretreatment permits and regulation of Stormwater, CSO's, and variance requests through a special projects group currently known as the Urban Wet Weather Group. Land Application of waste treatment plant sludge is no longer a part of the Office of Water Management but is now a part of the Office of Land Quality (formerly, Office of Solid and Hazardous Waste).

The purpose of the NPDES permit is to control the point source discharge of pollutants into the waters of the State such that the quality of the water of the State is maintained in accordance with the standards contained in 327 IAC 2. The NPDES permit requirements must ensure that the minimum amount of control is imposed upon any new or existing point source through the application of technology-based treatment requirement contained in 327 IAC 5-5-2. According to 327 IAC 5-2-2, "Any discharge of pollutants into waters of the State as a point source discharge, except for exclusions made in 327 IAC 5-2-4 is prohibited unless in conformity with a

valid NPDES permit obtained prior to discharge." This is the most basic principal of the NPDES permit program.

The majority of NPDES permits have existed since 1974. This means that most of the permit writing is for permit renewals. Approximately 10 percent of each year's workload is attributed to new permits, modifications and requests for estimated limits. NPDES permits are designed to be re-issued every five years but are administratively extended in full force and effect indefinitely if the permittee applied for a renewal before the current permit expires.

There are several different types of permits that are issued in the NPDES permitting program. Table 5-1 lists and describes the various permits.

## TABLE 5-1
## TYPES OF PERMITS ISSUED UNDER THE NPDES PROGRAM

| Type of Permit | Subtype | Comment |
|---|---|---|
| **Municipal, Semi-Public or State (sanitary discharger**) | Major | A facility owned by a municipality with a design flow Municipal of 1 MGD or greater (Cities, Towns, Regional Sewer Districts) |
| | Minor | Any municipally owned facility with a design flow of less than 1 MGD (Cities, Towns, Regional Sewer Districts) |
| | Semipublic | Any facility not municipally, State or Federally owned (i.e.- mobile home parks, schools, restaurants, etc.) |
| | State Owned | A facility owned or managed by a State agency (State parks, prisons, etc.) |
| | Federally Owned | A facility owned by a federal agency (military Owned installation, national park, federal penitentiary, etc.) |
| **Industrial (Wastewater generated in the process of producing a product)** | Major | Any point source discharger designated annually by agreement between the commissioner and EPA. Classification of discharger as a major involves consideration of factors relating to significance of impact on the environment, such as: Nature and quantity of pollutants discharged; Character and assimilative capacity of receiving waters; Presence of toxic pollutants in discharge; Compliance history of discharger. |
| | Minor | All dischargers which are not designated as major dischargers. |
| | General | General permit rule provides streamlined NPDES permitting process for certain categories of industrial point source discharges under requirements of the applicable general permit rule, rather than requirements of an individual permit specific to a single discharge. General permit rules: 327 IAC 15-7 Coal mining, coal processing, and reclamation activities; 327 IAC 15-8 Non-contact cooling water; 327 IAC 15-9 Petroleum product terminals; 327 IAC 15-10 Groundwater petroleum remediation systems; 327 IAC 15-11 Hydrostatic testing of commercial pipelines; 327 IAC 15-12 Sand, gravel, dimension stone or crushed stone operations. |
| | Cooling Water | Water which is used to remove heat from a product or process; the water may or may not come in contact with the product. |
| | Public Water Supply | Wastewater generated from the process of removing pollutants from ground or surface water for the purpose of producing drinking water. |
| **Pretreatment Urban Wet Weather Group** (Associated with NPDES but do not fall under same rule.) | Stormwater-related | Wastewater resulting from precipitation coming in contact with a substance which is dissolved or suspended in the water. |
| | Industrial Wastewater Pre-treatment | Processed wastewater generated by Industries that contribute to the overall wastewater received by the wastewater treatment plant. |
| | Combined Sewer Overflow (CSO) | Wastewater discharged from combined storm and sanitary sewers due to precipitation events. Municipal and Industrial Urban Wet Weather Programs |

### *5.1.3 Nonpoint Source Control Programs*

Nonpoint source (NPS) pollution is so named because the pollutants do not originate at single point sources, such as industrial and municipal waste discharge pipes. Instead, NPS pollutants are carried over fields, lawns, and streets by rainwater, wind, or snowmelt. This runoff may carry with it such things as fertilizer, road salt, sediment, motor oil, or pesticides. These pollutants either enter lakes and streams or seep into groundwater. While some NPS pollution is naturally occurring, most of it is a result of human activities.

Reducing NPS pollution requires careful attention to land use management and local geographic and economic conditions. The NPS Program was established to fully integrate methods for coping with the state's varied NPS water pollution problems. While a number of agencies and organizations currently have their own programs for addressing specific NPS issues, overall NPS coordination is being aided through the consolidated NPS Management Plan that was developed in the early stages of the Program's formation. Approximately, over 180 NPS-related projects have been funded and managed by the NPS Program since 1990. The NPS Management Plan was prepared in 1989, partially based on findings from the NPS Assessment Report, which was also completed that year. The NPS Management Plan was updated and received EPA approval in 1999. Some of the objectives of the Management Plan included the education of land users, the reduction and remediation of NPS pollution caused by erosion and sedimentation of forested and agricultural lands, and urban runoff. Other objectives addressed pesticide and fertilizer use, land application of sludge, animal waste practices, past and present mining practices, on-site sewage disposal, and atmospheric deposition.

The state's NPS Program, administered by the IDEM Office of Water Management's Watershed Management Section, focuses on the assessment and prevention of NPS water pollution. The program also provides for the exchange of education and information in order to improve the way land is managed. Through the use of federal funding for the installation of best management practices (BMPs), the NPS Program effectively reaches out to citizens and assists in the development of BMPs to manage land in such a way that less pollution is generated. The NPS program promotes a non-regulatory, voluntary approach to solving water quality problems.

The many nonpoint source projects funded through the Office of Water Management are a combination of local, regional, and statewide efforts sponsored by various public and not-for-profit organizations. The emphasis of these projects has been on the local, voluntary implementation of NPS water pollution controls. Since the inception of the program in the late 1980s, it has utilized over $12 million of federal funds for the development of over 180 projects.

The federal Clean Water Act contains nonpoint source provisions in several sections of the Act including the Section 319 Nonpoint Source Program, the Section 314 Clean Lakes Program (no longer funded), the Section 104(b)(3) Watershed Management Program, and the Section 205(j) Water Quality Planning Program. The Section 319 program provides for various voluntary projects throughout the state to prevent water pollution and also provides for assessment and management plans related to water bodies in Indiana impacted by NPS pollution. Section 314 has assessment provisions that assist in determining the nonpoint and point source water quality impacts on lakes and provides recommendations for improvements, but no longer receives funding. Section 104(b)(3) provides assistance in the development of watershed management planning efforts and education/information and implementation projects. Section 604(b) provides for planning activities relating to the improvement of water quality from

nonpoint and point sources. The Watershed Management Section within the Planning Branch of the Office of Water Management provides for the administration of the Section 319 funding source for the NPS-related projects. The Financial Management Services Branch of the Office of Water Management administers the Section 104(b)(3) and Section 604(b) grants.

Clean Water Act Section 319(h) grant monies are made available to the states on an annual basis by EPA. Agencies and organizations in the state that deal with NPS problems submit proposals to the Office of Water Management each year for use of these funds in various projects.

One of the most important aspects of all NPS pollution prevention programs is the emphasis on the watershed approach to these programs. This calls for users in the watershed to become involved in the planning and implementation of practices, which are designed to prevent pollution. By looking at the watershed as a whole, all situations causing the degradation of water quality will be addressed, not just a few. Appendix C lists the conservation partners and local stakeholders located in the Flatrock-Haw Creek watershed.

### *5.1.4 Integrating Point and Nonpoint Source Pollution Control Strategies*

Integrating point and nonpoint source pollution controls and determining the amount and location of the remaining assimilative capacity in a watershed are key long-term objectives of watershed management. The information is used for a number of purposes including: determining if and where new or expanded municipal or industrial wastewater treatment facilities can be allowed; setting the recommended treatment level at these facilities; and identifying where point and nonpoint source pollution controls must be implemented to restore capacity and maintain water quality standards.

Total Maximum Daily Loads

The Clean Water Act mandates an integrated point and nonpoint source pollution control approach. This approach, called a total maximum daily load (TMDL), uses the concept of determining the total pollutant loading from point and nonpoint sources that a waterbody can assimilate while still maintaining its designated use (maintaining water quality standards). EPA is responsible for ensuring that TMDLs are completed by States and for approving the completed TMDLs.

Under the TMDL approach, waterbodies that do not meet water quality standards are identified. States establish priorities for action, and then determine reductions in pollutant loads or other actions needed to meet water quality goals. The approach is flexible and promotes a watershed approach driven by local needs and directed by the State's list of priority waterbodies. The overall goal in establishing the TMDL is to establish the management actions on point and nonpoint sources of pollution necessary for a waterbody to meet water quality standards.

The Office of Water Management at IDEM is in the process of reorganizing its work activities around a five year rotating basin schedule. The waters of the state have been grouped geographically into major river basins, and water quality data and other information will be collected and analyzed from each basin, or group of basins, once every five years. The schedule for implementing the TMDL Strategy is proposed to follow this rotating basin plan to the extent possible. The TMDL Strategy discusses activities to be accomplished in three phases. Phase One involves planning, sampling and data collection and would take place the first year. Phase Two involves TMDL development and would occur in the second year, and Phase Three is

the TMDL implementation and would occur the third year. It is expected that some phases, especially implementation of TMDLs (Phase Three) in the basin(s), may take more than one year to fully accomplish.

Initially, as part of the TMDL Strategy in a watershed, the IDEM TMDL Program Manager, in coordination with the IDEM Basin Coordinator of the target basin, will develop an activity reference guide for each TMDL. This activity reference guide will provide: (1) a list of the necessary activities and tasks, (2) a schedule for completing activities and tasks associated with an individual TMDL, and (3) a roster that indicates which Section, staff, and /or contractor are responsible for completion of each activity/task.

In Phase Three, the TMDL scenario chosen in conjunction with watershed stakeholders during Phase Two will be used to develop a plan to implement the TMDL. During this process, stakeholder participation will be essential. The Basin Coordinator, in conjunction with the stakeholder groups, will develop a plan to implement the TMDL. Once the draft plan has been finalized through comments from stakeholder groups and IDEM, the plan becomes 'draft-final' and open public review. Public meetings will be held in areas affected to solicit comments.

### *5.1.5 Potential Sources of Funding for Water Quality Projects*

There are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofits, and private funding. Funds may be loans, cost-share projects, or grants. Section 319(h) grants and other funding sources are discussed below.

If a local government, environmental group, university researcher, or other individual or agency wants to find funding to address a local water quality problem, it is well worth the time to prepare a thorough but concise proposal and submit it to applicable funding agencies. Even if a project is not funded, follow-up should be done to determine what changes may be needed in order to make the application more competitive.

#### Section 319(h) Grants

EPA offers to the state Clean Water Act Section 319(h) grant moneys on an annual basis. These grants must be used to fund projects that address nonpoint source pollution issues. Some projects which the Office of Water Management has funded with this money in the past include best management practice (BMP) demonstrations, watershed water quality improvements, data management, educational programs, modeling, stream restoration, and riparian buffer establishment. Units of government, nonprofit groups, and universities in the state that have expertise in nonpoint source pollution problems are invited to submit Section 319(h) proposals to the Office of Water Management.

Office of Water Management staff review proposals for minimum 319 eligibility criteria such as:

- Does it support the state NPS Management Program milestones?
- Does the project address targeted, high priority watersheds?
- Is there sufficient non-federal cost-share match available (25% of project costs)?
- Are measurable outputs identified?
- Is monitoring required? Is there a Quality Assurance/Quality Control plan for monitoring?
- If a Geographical Information System is used, is it compatible with that of the state?

- Is there a commitment for educational activities and a final report?
- Are upstream sources of NPS pollution addressed?
- Are stakeholders involved in the project?

Office of Water Management staff separately review and rank each proposal which meets the minimum 319 eligibility criteria. In their review, members consider such factors as: technical soundness; likelihood of achieving water quality results; degree of balance lent to the statewide NPS Program in terms of project type; and competence/reliability of contracting agency. They then convene to discuss individual project merits, to pool all rankings and to arrive at final rankings for the projects. Comments are also sought from outside experts in other governmental agencies, nonprofit groups, and universities. The Office of Water Management seeks a balance between geographic regions of the state and types of projects. All proposals that rank above the funding target are included in the annual grant application to EPA, with EPA reserving the right to make final changes to the list. Actual funding depends on approval from EPA and yearly congressional appropriations.

To obtain more information about applying for a Section 319(h) grant, contact:

IDEM Office of Water Management
100 N. Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 233-8803

Other Sources of Funding

Besides Section 319(h) funding, there are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofit, and private funding. Funds may be loans, cost-shares, or grants. Appendix D provides a summary list of agencies and funding opportunities.

## 5.2 Indiana Department of Natural Resources Water Programs

### *5.2.1 Division of Soil Conservation*

The Division of Soil Conservation's mission is to ensure the protection, wise use, and enhancement of Indiana's soil and water resources. The Division's employees are part of Indiana's Conservation Partnership, which includes the 92 soil and water conservation districts (SWCDs), the USDA Natural Resources Conservation Service, and the Purdue University Cooperative Extension Service. Working together, the partnership provides technical, educational, and financial assistance to citizens to solve erosion and sediment-related problems occurring on the land or impacting public waters.

The Division administers the Clean Water Indiana soil conservation and water quality program under guidelines established by the State Soil Conservation Board, primarily through the SWCDs in direct service to landusers. The Division staff includes field-based resource specialists who work closely with landusers, assisting in the selection, design, and installation of practices to reduce soil erosion on their land. Regional Urban Conservation Specialists work primarily with developers, contractors, and others to address erosion and sediment concerns in urban

settings, developments under construction, and in landfills. The Lake and River Enhancement staff (LARE) oversee all administrative, operational, and technical aspects of the LARE program, which provides financial assistance to local entities concerned with improving and maintaining water quality in public-access lakes, rivers, and streams.

### *5.2.2 Division of Water*

The IDNR, Division of Water (DOW) is charged by the State of Indiana to maintain, regulate, collect data, and evaluate Indiana's surface and ground water resources.

The Engineering Branch of the DOW includes Dam and Levee Safety, Project Development, Surveying, Drafting, and Computer Services. The Dam and Levee Safety Section performs geotechnical and hydraulic evaluation on existing and proposed dams and levees throughout the State. The Project Development Section provides technical support to locally funded water resource projects along with engineering leadership and construction management to State funded water resource projects. The remaining sections provide support services to all Sections within the DOW such as reservoir depth mapping, topographic mapping, highwater marks, design of publications and brochures, and computer procurement and maintenance.

The Planning Branch of the DOW consists of Basin Studies, Coastal Coordination, Floodplain Management, Ground Water, Hydrology and Hydraulics, and Water Rights. Basin Studies are comprehensive reports on surface-and ground-water availability and use. Coastal Coordination is a communication vehicle to address Lake Michigan's diverse shoreline issues. Floodplain Management involves various floodplain management aspects including coordination with the National Flood Insurance Program and with State and Federal Emergency Management agencies during major flooding events. The Ground Water Section maintains the water-well record computer database and publishes reports and maps on the ground-water resource for the State. Hydrology and Hydraulics Section develops and reviews floodplain mapping and performs hydrologic studies and modeling. The Water Rights Section investigates and mediates groundwater/surface water rights issues, licenses water-well drillers, and develops well construction and abandonment procedures.

The Regulations Branch of DOW is made up of Stream Permits, Lake Permits, Permit Administration, Public Assistance, and Legal Counsel. The Stream Permits Section is responsible for reviewing permit applications for construction activity in the 100-year regulatory floodway along Indiana's waterways. The Lake Permits Section reviews construction projects at or below the legal lake level for all of Indiana's public freshwater lakes. Permit Administration Section provides administrative support to Branch staff, maintains the application database, and coordinates the application review process with other Divisions. The Public Assistance Section provides technical assistance on possible permit applications on proposed construction projects, investigates and mediates unpermitted construction activities and in some cases with the support of Legal Counsel pursues legal action for violation of State laws.

## 5.3 USDA/Natural Resources Conservation Service Water Quality Programs

While there are a variety of USDA programs available to assist people with their conservation needs. The following assistance programs are the principal programs available.

Conservation Technical Assistance (CTA)

The purpose of the program is to assist landusers, communities, units of state and local government, and other Federal agencies in planning and implementing conservation systems. The purpose of the conservation systems are to reduce erosion, improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitat, improve air quality, improve pasture and range condition, reduce upstream flooding, and improve woodlands.

The objective of the program is to: Assist individual landusers, communities, conservation districts, and other units of State and local government and Federal agencies to meet their goals for resource stewardship and assist individuals to comply with State and local requirements. NRCS assistance to individuals is provided through conservation districts in accordance with the Memorandum of Understanding signed by the Secretary of Agriculture, the Governor of the State, and the conservation district. Assistance is provided to landusers voluntarily applying conservation and to those who must comply with local or State laws and regulations. Assistance is also provided to agricultural producers to comply with the highly erodible land (HEL) and wetland (Swampbuster) provisions of the 1985 Food Security Act as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (16 U.S.C. 3801 et. seq.); the Federal Agriculture Improvement and Reform Act of 1996, and wetlands requirements of Section 404 of the Clean Water Act. NRCS makes HEL and wetland determinations and helps land users develop and implement conservation plans to comply with the law. They also provide technical assistance to participants in USDA cost-share and conservation incentive programs. NRCS collects, analyzes, interprets, displays, and disseminates information about the condition and trends of the Nation's soil and other natural resources so that people can make good decisions about resource use and about public policies for resource conservation. They also develop effective science-based technologies for natural resource assessment, management, and conservation.

Conservation of Private Grazing Land Initiative (CPGL)

The Conservation of Private Grazing Land initiative will ensure that technical, educational, and related assistance is provided to those who own private grazing lands. It is not a cost-share program. This technical assistance will offer opportunities for: better grazing land management; protecting soil from erosive wind and water; using more energy-efficient ways to produce food and fiber; conserving water; providing habitat for wildlife; sustaining forage and grazing plants; using plants to sequester greenhouse gases and increase soil organic matter; and using grazing lands as a source of biomass energy and raw materials for industrial products.

Conservation Reserve Program (CRP)

NRCS provides technical assistance to landowners interested in participating in the Conservation Reserve Program administered by the USDA Farm Service Agency. The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost-share funding is provided to establish the vegetative cover practices.

Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program provides technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation. The purposes of the program are achieved through the implementation of a conservation plan, which includes structural, vegetative, and land management practices on eligible land. Five to ten year contracts are made with eligible producers. Cost-share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, and grazing land management.

Fifty percent of the funding available for the program is targeted at natural resource concerns relating to livestock production. The program is carried out primarily in priority areas that may be watersheds, regions, or multi-state areas, and for significant statewide natural resource concerns that are outside of geographic priority areas.

Watershed Surveys and Planning

The Watershed and Flood Prevention Act, P.L. 83-566, August 4, 1954, (16 U.S.C. 1001-1008) authorized this program. Prior to fiscal year 1996, small watershed planning activities and the cooperative river basin surveys and investigations authorized by Section 6 of the Act were operated as separate programs. The 1996 appropriations act combined the activities into a single program entitled the Watershed Surveys and Planning program. Activities under both programs are continuing under this authority.

The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries.

Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance. The focus of these plans is to identify solutions that use land treatment and non-structural measures to solve resource problems.

Watershed Program and Flood Prevention Program (WF 08 or FP 03)

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Wetlands Reserve Program (WRP)

The Wetlands Reserve Program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30 year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetlands. The 30 year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The voluntary agreements are for a minimum 10 year duration and provide for 75 percent of the cost of restoring the involved wetlands. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the easement or agreement. In all instances, landowners continue to control access to their land.

Wildlife Habitat Incentives Program (WHIP)

The Wildlife Habitat Incentives Program provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices. USDA and program participants enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts a minimum of 10 years from the date that the contract is signed.

# REFERENCES

Bunce, Nigel J. 1994. *Environmental Chemistry*. Second Edition. Wuerz Publishing Ltd., Winnipeg, Canada.

Indiana Business Research Center (IBRC). 1999. Indiana County Population Projections 1990-2020. http://www.stats.indiana.edu/web/county/projections/99county_projections.html

IBRC. 1997. Indiana Cities and Towns Population. http://www.stats.indiana.edu/web/city/citytwnest99.html

Indiana Department of Environmental Management (IDEM). 1998. Indiana 305(b) Report *Indiana Water Quality Report 1998*. Office of Water Management

IDEM. 1999. Confined Feeding Operations. As presented on http://www.stat.in.us/idem/oshwm/confined.html

Indiana Department of Natural Resources (IDNR). 1980. *The Indiana Water Resource*. Indiana Department of Natural Resources, Indianapolis, IN.

IDNR. 1999. *The Indiana Canoeing Guide.* Indiana Department of Natural Resources, Indianapolis, IN. http://www.state.in.us/dnr/outdoor/canoegui/index.htm

Indiana State University (ISU),1999. Indiana GAP Analysis Home Page. http://139.102.7.220/h1/bertha/gap/ Last accessed: June

Natural Resources Commission(NRC),1997. Outstanding Rivers List for Indiana. As presented on http://www.ai.org/nrc/outstand.htm Last update: October.

U.S. Department of Agriculture (USDA). 1997. 1997 Census of Agriculture Profiles: Indiana State and County Profiles Ranked Items and Other County Summary Data. http://www.nass.usda.gov/census/census97/profiles/in/inb.htm

U. S. Environmental Protection Agency (EPA). 1997. Guidelines for Preparation of the State Water Quality Assessments (305[b] Reports) and Electronic Updates: Report Contents. Washington, DC: U. S. Environmental Protection Agency. *EPA-841-B-97-002A*.

U.S. Geological Survey (USGS), and EPA. Undated. Ecoregions Map of Indiana and Ohio. USGS, P.O. Box 25286, Denver, Colorado 80225. ISBN 0-607-90528-x.

# Flatrock-Haw Creek Watershed Restoration Action Strategy

## Part II: Concerns and Recommendations

***Prepared by***

Indiana Department of
Environmental Management
Office of Water Quality

*May 2001*

# Foreword

The Flatrock-Haw Creek Watershed Restoration Action Strategy (WRAS) is intended to be a living document to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The first draft of the Flatrock-Haw Creek WRAS was released for public review during April 2001. This version of the WRAS incorporates public comments received during that time period.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

---

Wes Stone, Project Manager/Special Projects
IDEM Office of Water Quality
100 N. Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015

wstone@dem.state.in.us

# Flatrock-Haw Creek Watershed Restoration Action Strategy
# Part II: Concerns and Recommendations

Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Flatrock-Haw Creek Watershed and lists recommended management strategies to address these concerns.

Part II includes:



## 1 Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

The Flatrock-Haw Creek watershed contains potential stakeholder groups that have different missions. Many of these groups have a long history of working in the Flatrock-Haw Creek watershed. The following discussion briefly describes some of the watershed groups and lists their priorities and concerns.

*Flatrock River Watershed Steering Committee*

The focus of the Flatrock River Watershed Steering Committee is flood control; however, they are also concerned about water quality and improving recreational value. In 1997, this group completed the Flatrock River Watershed Management Plan, which is included in this WRAS document as Appendix E (Part I).

*Soil and Water Conservation Districts (SWCDs)*

The Shelby and Rush County SWCDs are working cooperatively on the Conns Creek Watershed Project. Ultimately, this project will produce a Conns Creek watershed management plan, then implementation activities will commence within the watershed. The Shelby County SWCD also has an active volunteer water quality monitoring program.

## 2 Water Quality Concerns and Priority Issues Identified by State and Federal Agencies

This section presents the combined efforts of state and federal agencies, and universities (such as IDEM, IDNR, USDA-Natural Resources Conservation Service, Ohio River Valley Water Sanitation Commission, Purdue University, Indiana University, Indiana Geologic Survey, and US

Geological Survey) to assess water quality concerns and priority issues in the Flatrock-Haw Creek Watershed. This multi-organization effort formed the basis of the Unified Watershed Assessment for Indiana. At this time, the Unified Watershed Assessment has been completed for 1998 and updated for 2000-2001.

## Indiana's Unified Watershed Assessment (UWA)

The UWA workgroup gathered a wide range of water quality data that could be used to characterize Indiana's water resources. These data were used in 'layers' in order to sort the 8-digit HUC watersheds according to the present condition of the water in lakes, rivers, and streams. The workgroup used only those data which concerned the water column, organisms living in the water, or the suitability of the water for supporting aquatic ecosystems. Each 'layer' of information/data was partitioned by percentiles into scores. The scores ranged between one and five, with a score of one indicative of good water quality or minimum impairment, and a score of five indicating heavily impacted or degraded water quality.

The data layers used in the 1998 and the 2000-2001 update include:

- Lake Fishery: Large mouth bass community information for lakes
- Stream Fishery: Small mouth bass community information for streams
- Aquatic Life Use Support: The "livability" of the water column for aquatic life, determined from evaluation of chemical and physical water data, and assessment of aquatic life
- Fish Consumption Advisories: Site specific advisories based on current data
- Fish Index of Biotic Integrity: Based on fish community diversity and fish health
- Qualitative Habitat Evaluation Index: Measure of whether the aquatic habitat is suitable for diverse communities, based on visual observations
- Lake Trophic Scores: Indicator for the rate at which a lake is 'aging' due to inputs of nutrients and other factors
- Sediment Potential: Indicator of potential sediment input to waterbodies in the watershed

The sources and additional information for these data layers include:

- Lake Fishery: From IDNR fisheries surveys of lakes and reservoirs from 1972 to 1994. Raw scores were averaged for all lakes in the watershed
- Stream Fishery: From IDNR fisheries surveys of streams from 1970 to 1994. Raw scores were averaged for all streams in the watershed
- Aquatic Life Use Support: IDEM, Office of Water Quality, Assessment Branch
- Fish Consumption Advisories: ISDH and IDEM, Office of Water Quality, Assessment Branch
- Fish Index of Biotic Integrity: IDEM, Office of Water Quality, Assessment Branch
- Qualitative Habitat Evaluation Index: IDEM, Office of Water Quality, Assessment Branch
- Lake Trophic Scores: Indiana Clean Lakes Program through IDEM, Office of Water Quality, Assessment Branch. This score was based on information gathered from sampling conducted in the 1970's and 1980's

During summer 1999 the UWA workgroup used additional layers of information to identify the **resource concerns and stressors** for each of the 361 11-digit watersheds in Indiana. Examination of the human activities that have the potential to impact the ecosystem will help

planners to focus on those areas where restoration may be most critical. Organizations can identify opportunities to use their programs and resources to address those areas.

This focusing process will illuminate areas where the interests of two or more partner agencies may converge. It is intended that this will lead to more effective allocation of resources for restoration and protection activities. At the local level, this information can assist groups to prioritize watershed activities and provide some discussion points for planning.

This amended assessment has the following benefits:

- Provides a logical process for targeting funds, which may be expanded or updated without changing the basic framework.
- Provides information at a finer resolution (11-digit hydrologic units) to agencies and local groups interested in watershed assessment.
- Identifies data gaps.
- Can be used as a compliment to other assessments, such as the 305(b) Report and 303(d) List.

Table 2-1 and Figure 2-1 show the results of the 2000-2001 UWA for the Flatrock-Haw Creek watershed.

# 3 Identification of Impaired Waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Indiana's 303(d) list was approved by EPA on February 16, 1999.

Once the Section 303(d) list and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. The TMDL is an allocation that determines the point and nonpoint source (plus margin of safety) load reductions required in order for the waterbody to meet water quality standards. IDEM's Office of Water Quality has and continues to perform point source waste load allocations for receiving waters. Part I of the WRAS briefly outlines IDEM's strategy for developing TMDLs.

The following Flatrock-Haw Creek Watershed waterbodies are on Indiana's 1998 Clean Water Act Section 303(d) list submitted and approved by EPA 303(d) list (Figure 3-1):

| Water Body | Location/Reach | County | Parameter(s) of Concern | HUC | Subwatershed(s) |
|---|---|---|---|---|---|
| Flat Rock River | All | Rush | FCA for Hg | 05120205 | 020 040 |
| Flat Rock River | All | Shelby | FCA for PCB & Hg | 05120205 | 020 040 |

FCA - Fish Consumption Advisory
PCB - Polychlorinated Biphenyls
Hg - Mercury
***Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above. The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if

no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.

# 4 Priority Issues and Recommended Management Strategies

Part I provided the existing water quality information for the Flatrock-Haw Creek watershed and Part II lists priority issues and concerns from local, state, and federal stakeholders in the watershed. This section pulls together the priority issues and concerns held by all stakeholders and recommends management strategies. Underlying all discussions of priority issues and concerns is the fact that improving water quality in the Flatrock-Haw Creek Watershed will also enhance the natural and recreational values of Flatrock-Haw Creek. Each subsection below focuses on a single priority issue.

## 4.1 Data/ Information and Targeting

The success in restoring water quality in the Flatrock-Haw Creek Watershed is fundamentally based on identifying the specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source.

**Recommended Management Strategy 1:** Numerous data collection efforts are ongoing in the Flatrock-Haw Creek Watershed. This information should be used in prioritizing and targeting specific problems and geographic areas in the watershed. The scale at which targeting and prioritization should occur is the 14-digit HUC watershed area (Figure 2-2 of Part I). Targeting and prioritization will require input from stakeholders living in those geographic areas. The purpose of prioritization and targeting is to enhance allocation of resources in the effort of improving water quality.

**Recommended Management Strategy 2:** Through the development of Total Maximum Daily Loads (TMDLs) for impaired waterbodies in the Flatrock-Haw Creek Watershed, all sources contributing to the impairment of a waterbody will be identified and quantified in terms of their contribution to the waterbody. This includes gathering more data and information on nonpoint sources of water pollution. Throughout the TMDL process, information and feedback from watershed stakeholders will be required in order to generate appropriate allocation scenarios. The result of developing TMDLs will be an understanding of the impact of nonpoint sources on water quality in the watershed.

## 4.2 Streambank Erosion and Stabilization

The cutting and erosion of streambanks within the Flatrock-Haw Creek Watershed is a major concern. This cutting and erosion increases the sediment load in waterbodies and directly impacts the scenic and recreational values of waterbodies in the Flatrock-Haw Creek Watershed. Streambank cutting and erosion is often a function of many factors that include: stream energy and velocity, flooding, and land management. Increased drainage in headwater

streams and ditches increases stream energies during rainfall events and often leads to increased streambank cutting and erosion downstream. Land clearing and urban development also impact volume and velocity of runoff. Hence, this problem is not easily solved.

**Recommended Management Strategy 1:** Structural stabilization of specific streambank areas in the Flatrock-Haw Creek watershed may solve problems on a temporary basis. However, a comprehensive understanding of drainage, stream flows and energies, and land management practices is required to adequately approach this problem. Conservation partners (local, state, and federal) are actively working within their specific geographic areas (typically at the county level); however, this may not facilitate solving the streambank cutting and erosion problems because efforts may not be coordinated between headwater and downstream areas. For example, drainage should take into account the work and efforts of downstream partners to reduce flooding and streambank cutting. Conservation efforts should be in the context of watersheds and span county boundaries in order to account for downstream impacts. Local Drainage Boards, Planning and Zoning Boards, and County Commissioners could effectively address this issue by involving local stakeholders in the decision making process and approaching the issue on a watershed basis.

## 4.3 Failing Septic Systems and Straight Pipe Discharges

Local county health departments and other stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as significant sources of water pollution in the Flatrock-Haw Creek watershed. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (327 IAC 5-1-1.5); however, these practices still exist in the Flatrock-Haw Creek watershed.

**Recommended Management Strategy 1:** The direct impact of communities discharging their septic tank effluent to waterbodies needs to be adequately characterized. This will involve coordination between the Office of Water Quality, local health departments, Indiana State Department of Health, and other stakeholders. The option of choice to eliminate the illegal discharges will be a cooperative effort between homeowners and local, state, and federal stakeholders.

**Recommended Management Strategy 2:** Local planning, zoning, and health ordinances could be adopted or strengthened to address this problem during new development. Existing local ordinances could be enforced more vigorously to correct problems with existing systems. Both of these strategies will require input from local stakeholders.

**Recommended Management Strategy 3:** An education/ outreach program on the health and environmental risks of septic system discharges, system maintenance, and system function would provide homeowners and others with basic information to better understand the impacts of inadequate systems. This kind of education effort would involve local health departments, Indiana State Department of Health, IDEM, and other stakeholders. The ArrowHead RC&D is working on a project to demonstrate proper septic system installation.

## 4.4 Water Quality - General

The Clean Water Act Section 303(d) list presented in Section 3 lists impaired waterbodies for the Flatrock-Haw Creek watershed.

**Recommended Management Strategy:** The Clean Water Act requires states to complete TMDLs for waterbodies listed on the Section 303(d) list. The Office of Water Quality is currently evaluating and exploring the modeling process and data needs required to complete TMDLs for the Section 303(d) listed waterbodies. Completion of a TMDL will involve loading allocations of a pollutant to both point and nonpoint sources. The development of TMDLs will involve meetings with stakeholder groups linked to the Section 303(d) waterbodies. As TMDLs are developed, this Watershed Restoration Action Strategy will be amended to incorporate the final TMDLs.

## 4.5 Fish Consumption Advisories

As noted in Part I and Part II, fish consumption advisories are concerns within the Flatrock-Haw Creek watershed.

**Recommended Management Strategy 1:** In many cases, the source of the contamination is unknown and may be from atmospheric deposition or some unknown discharge. To address this concern, the cause or source must be identified. Until that is accomplished, the fish consumption advisories should be followed.

## 4.6 Nonpoint Source Pollution - General

Nonpoint source pollution contributions are often difficult to assess or quantify. They can include sediment deposition from soil erosion, nutrient runoff from animal wastes and commercial fertilizer, herbicide and insecticide runoff, and oil or fuel waste runoff. Nonpoint pollution can emanate from agricultural as well as urban lands. Currently, loadings of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the Flatrock-Haw Creek watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution.

**Recommended Management Strategy 1:** Through the TMDL development process, the Office of Water Quality will identify, assess, and quantify nonpoint source pollutant loadings to impaired waterbodies. In order to accomplish this task, the Office of Water Quality will work closely with local, state, and federal stakeholders at the watershed and subwatershed level. Loading scenarios for nonpoint source pollutants will be developed by the Office of Water Quality and reviewed by local, state, and federal stakeholders. Implementation of nonpoint source controls will involve a blend of funding assistance and regulatory action, where applicable.

**Recommended Management Strategy 2:** Numerous funding mechanisms, such as Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement program, and 319(h) grants, exist to promote practices to reduce nonpoint source pollution in the watershed. To more efficiently and effectively address nonpoint source pollution in the watershed, the prioritization and targeting discussed previously in Part II should be used to allocate further application of resources.

**Recommended Management Strategy 3:** The management of urban nonpoint sources can be addressed through effective land use planning and site design. Designs that incorporate less impervious area and more natural infiltration areas have proven effective in reducing urban nonpoint pollution. Local stakeholders working with local planning and zoning authorities, and

developers, should implement more stringent site design requirements to reduce nonpoint source contaminants. This effort would be supported by the state and federal stakeholders.

### *4.6.1 Nonpoint Source Pollution- Education and Outreach*

This Watershed Restoration Action Strategy is a beginning point for education and outreach efforts. It compiles existing knowledge about the water resource in this watershed and presents it to the stakeholders who live in the Flatrock-Haw Creek. It brings to a public forum the available information and local concerns. However, the education process does not stop with the publication of this document.

**Recommended Management Strategy:** Local stakeholders, in cooperation with state and federal agencies, need to seek additional information on water quality concerns and issues addressed in this document and make that information available to the public. Additionally, the problems associated with septic failures, soil erosion, land use issues, and riparian zones can be emphasized through meetings, training sessions, and stakeholder group discussions. Field days are excellent ways to present information and encourage discussion. Use of experts with strong background knowledge coupled with local sponsors is an effective method to convey solutions to these problems.

## 4.7 Point Sources - General

There are 48 active NPDES permitted dischargers, and 6 CSO discharge points in the Flatrock-Haw Creek watershed. Additionally there are illegal point source discharges, such as tiles discharging septic tank effluent that exist in the watershed.

**Recommended Management Strategy:** The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illegal point sources and noncomplying point sources. Improving compliance of NPDES dischargers and identifying illegal dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illegal discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution.

# 5 Future Expectations and Actions

As discussed in Part I, this Watershed Restoration Action Strategy is intended to be fluid document that will be revised or amended as new information becomes available. Section 5.1 discusses expectations derived from the Strategy and how progress will be measured. Specific revisions and amendments to the Watershed Restoration Action Strategy are discussed in Section 5.2. Finally, the Watershed Restoration Action Strategy will be reviewed by all stakeholders before it becomes final, as described in Section 5.3.

## 5.1 Expectations and Measuring Progress

The Flatrock-Haw Creek Strategy provides a starting point to address water quality concerns held by local, state, and federal stakeholders. Part II provides recommended management strategies to address these concerns. Through cooperative efforts with stakeholders, all of the recommended management strategies listed will begin implementation by the summer of 2002.

Measurement of progress is critical to the success of any plan. Water quality improvements will not take place overnight. Measuring of progress in terms of water quality will be provided through the Office of Water Quality Assessment Branch's rotating basin monitoring strategy.

## 5.2 Expected Revisions and Amendments

This Watershed Restoration Action Strategy is intended to provide a starting point to improve water quality and measure the improvement. Hence, this document will require revisions and amendments as new information becomes available. The future revisions and amendments have been divided into those that are expected within the next year (Section 5.2.1) and those that will occur over a long-term basis (Section 5.2.2).

### *5.2.1 Short Term Revisions and Amendments*

The most significant revisions and amendments will likely occur during 2001 and after, as a result of stakeholder review.

### *5.2.2 Long Term Revisions and Amendments*

The Office of Water Quality is moving toward adopting a watershed management approach to solve water quality problems. Part of the watershed approach is the use of a rotating basin management cycle. The Assessment Branch of the Office of Water Quality has already adopted this rotating basin cycle in its intensive monitoring and assessment of Indiana waterbodies (this is in addition to the already established fixed monitoring station monitoring which occurs on a monthly basis). The Watershed Restoration Action Strategy may be revised or amended when sufficient information becomes available.

## 5.3 Review of the Watershed Restoration Action Strategy

Before this Watershed Restoration Action Strategy becomes final, it will undergo rigorous review. The first stage of review will be performed internally by the Office of Water Quality. Once the Watershed Restoration Action Strategy has been revised to address internal Office of Water Quality comments, it will be circulated to local, state, and federal stakeholders in the watershed. Written comments from local, state, and federal stakeholders will be addressed and the Watershed Restoration Action Strategy will again be revised to incorporate applicable comments. Once internal and external comments have been addressed, the final version of the Watershed Restoration Action Strategy will be released.

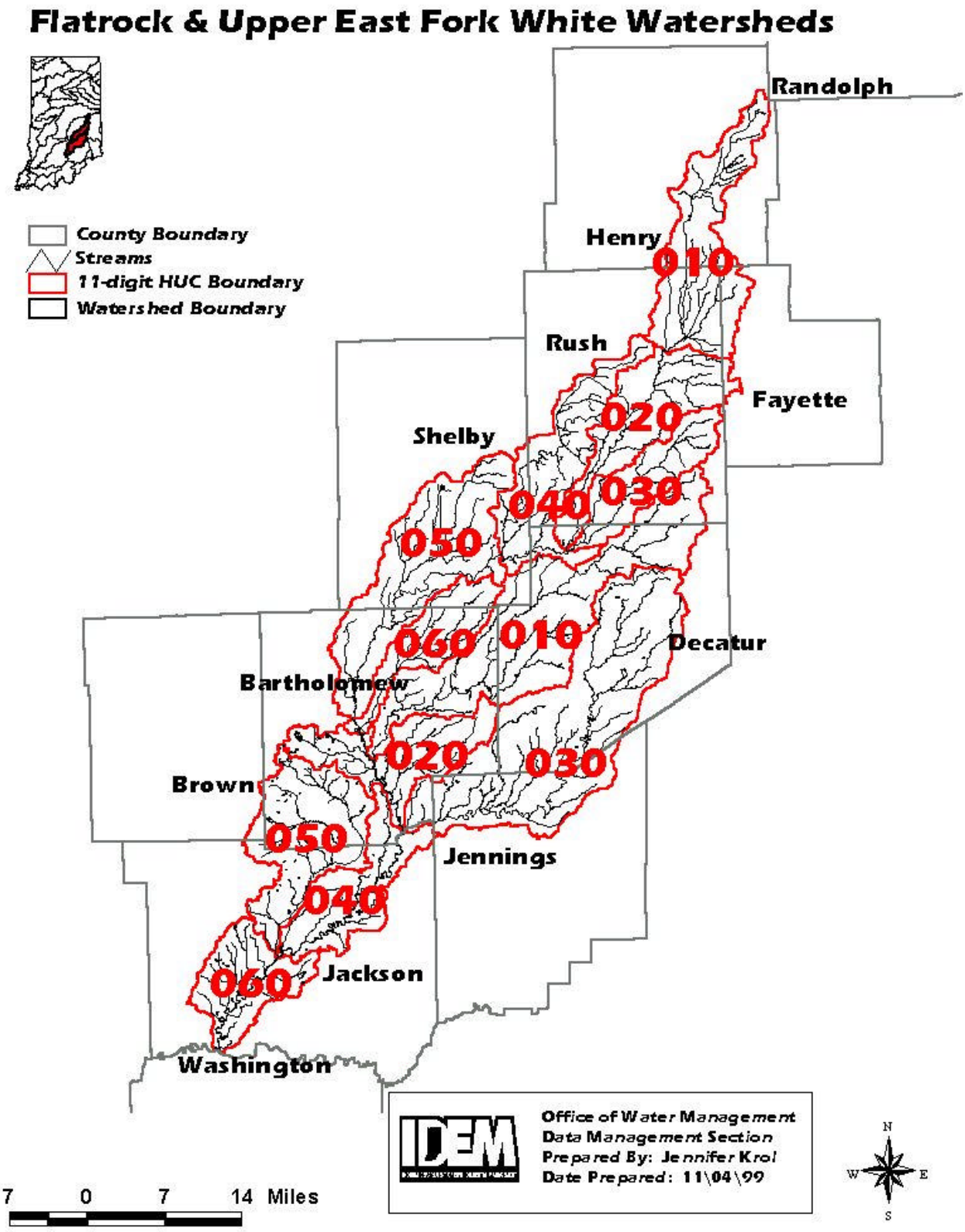
## Table 2-1

**HYDROLOGIC UNIT SCORES for Each Parameter Used in the Unified Watershed Assessment [2000-2001]**

| 11 Digit Hydrologic Unit | | Mussel Diversity and Occurrence | Aquatic Life Use Support | Recreational Use Attainment | Stream Fishery | Lake Fishery | Eurasian Milfoil Infestation Status | Lake Trophic Status | Critical Biodiversity Resource | Aquifer Vulnerability | Population Using Surface Water for Drinking Water | Residential Septic System Density | Degree of Urbanization | Density of Livestock | % Cropland | Mineral Extraction Activities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flatrock | 05120205010 | 2 | 1 | nd | 3 | nd | nd | nd | 2 | 3 | 2 | 3 | 1 | 3 | 4 | 2 |
| | 05120205020 | 3 | 1 | nd | 4 | nd | nd | nd | 2 | 4 | 2 | 2 | 2 | 3 | 5 | 3 |
| | 05120205030 | nd | 1 | nd | nd | nd | nd | nd | 2 | 4 | 2 | 1 | 2 | 4 | 5 | 3 |
| | 05120205040 | 2 | 1 | nd | 1 | nd | nd | nd | 2 | 4 | 2 | 2 | 2 | 4 | 5 | 3 |
| | 05120205050 | 2 | 1 | nd | 2 | nd | nd | nd | 3 | 3 | 2 | 3 | 2 | 3 | 4 | 3 |
| | 05120205060 | nd | 1 | 1 | nd | nd | nd | nd | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 2 |

Note:
The UWA scores range from 1 to 5, with a score of 1 indicating good water quality and a score of 5 indicating severe impairment.
Nd = No data

**Figure 2-1**


Flatrock & Upper East Fork White Watersheds
County Boundary
Streams
11-digit HUC Boundary
Watershed Boundary
Randolph
Henry
010
Rush
Fayette
020
Shelby
040
030
050
060
010
Decatur
Bartholomew
020
030
Brown
050
Jennings
040
060
Jackson
Washington
IDEM
Office of Water Management
Data Management Section
Prepared By: Jennifer Krol
Date Prepared: 11\04\99
7 0 7 14 Miles
N
W
E
S

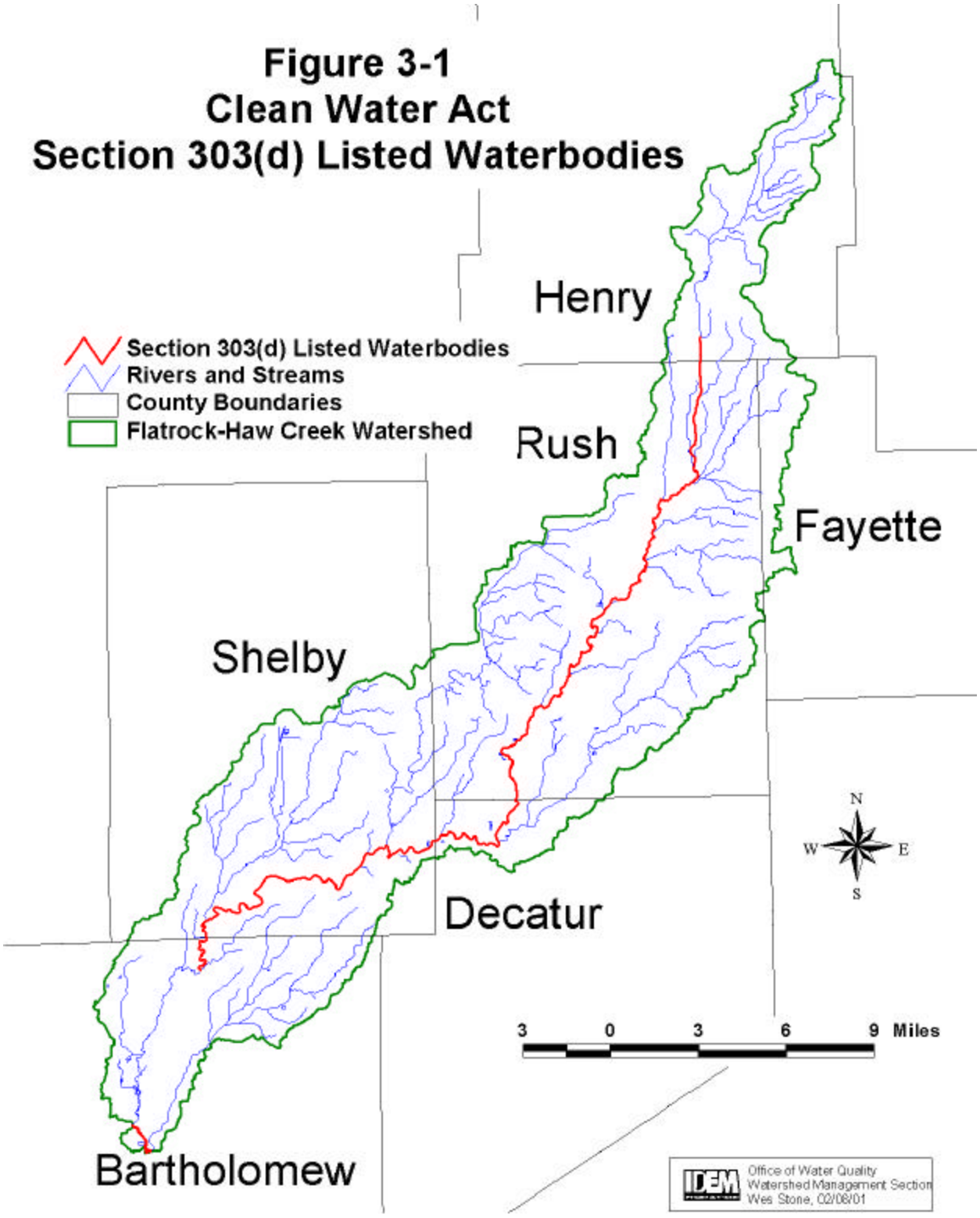


Figure 3-1
Clean Water Act
Section 303(d) Listed Waterbodies
Section 303(d) Listed Waterbodies
Rivers and Streams
County Boundaries
Flatrock-Haw Creek Watershed
Henry
Rush
Fayette
Shelby
Decatur
Bartholomew
N
W
E
S
3 0 3 6 9 Miles
IDEM
Office of Water Quality
Watershed Management Section
Wes Stone, 02/08/01

# APPENDIX A

## BENCHMARK CHARACTERISTIC ANALYSIS OF DATA FROM FIXED STATIONS IN THE FLATROCK- HAW CREEK WATERSHED 1991 TO 1997

Station: EW-239

| | Valid N | Mean | Confid. -95.000% | Confid. +95.000% | Median | Sum | Minimum | Maximum | Lower Quartile | Upper Quartile | Range | Quartile Range | Variance | Std.Dev. | Standard Error | Skewness | Std.Err. Skewness | Kurtosis | Std.Err. Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity (mg/l) | 82 | 231.5976 | 222.8742 | 240.321 | 242.5 | 18991 | 92 | 300 | 215 | 260 | 208 | 45 | 1576.219 | 39.70162 | 4.384311 | -1.34876 | 0.265724 | 2.089467 | 0.525618 |
| Ammonia (mg/l as N) | 82 | 0.062805 | 0.053223 | 0.072387 | 0.05 | 5.15 | 0.05 | 0.3 | 0.05 | 0.05 | 0.25 | 0 | 0.001902 | 0.043611 | 0.004816 | 4.50597 | 0.265724 | 21.51921 | 0.525618 |
| BOD (mg/l) | 41 | 1.192683 | 0.859584 | 1.525782 | 1 | 48.9 | 0.5 | 6.2 | 0.5 | 1.6 | 5.7 | 1.1 | 1.113695 | 1.055318 | 0.164813 | 2.948757 | 0.3695 | 12.05526 | 0.724483 |
| COD (mg/l) | 82 | 11.29878 | 9.548237 | 13.04932 | 9.1 | 926.5 | 2.5 | 56.9 | 7 | 13.9 | 54.4 | 6.9 | 63.47321 | 7.967007 | 0.879809 | 3.064454 | 0.265724 | 14.19537 | 0.525618 |
| Cyanide (mg/l) | 81 | 0.005099 | 0.004985 | 0.005213 | 0.005 | 0.413 | 0.005 | 0.008 | 0.005 | 0.005 | 0.003 | 0 | 2.65E-07 | 0.000515 | 5.72E-05 | 5.223526 | 0.267302 | 26.55153 | 0.528675 |
| Nitrate (mg/l as N) | 82 | 3.112195 | 2.874079 | 3.350311 | 3 | 255.2 | 1.2 | 5.5 | 2.2 | 3.8 | 4.3 | 1.6 | 1.174417 | 1.083705 | 0.119675 | 0.380762 | 0.265724 | -0.76055 | 0.525618 |
| Total Phosphorus (mg/l as P) | 82 | 0.090854 | 0.075624 | 0.106083 | 0.08 | 7.45 | 0.015 | 0.51 | 0.05 | 0.1 | 0.495 | 0.05 | 0.004804 | 0.069312 | 0.007654 | 3.247081 | 0.265724 | 16.17235 | 0.525618 |
| Total Solids (mg/l) | 82 | 416.1463 | 408.6387 | 423.654 | 412 | 34124 | 349 | 579 | 394 | 439 | 230 | 45 | 1167.484 | 34.16847 | 3.773277 | 1.356607 | 0.265724 | 5.366797 | 0.525618 |
| Suspended Solids (mg/l) | 82 | 31.2439 | 19.93747 | 42.55034 | 16 | 2562 | 2 | 392 | 8 | 29 | 390 | 21 | 2647.866 | 51.45742 | 5.682521 | 4.788321 | 0.265724 | 30.07486 | 0.525618 |
| Dissolved Solids (mg/l) | 21 | 366.619 | 347.1489 | 386.0892 | 379 | 7699 | 275 | 429 | 339 | 398 | 154 | 59 | 1829.548 | 42.77321 | 9.33388 | -0.66854 | 0.501195 | -0.38866 | 0.971941 |
| Sulfate (mg/l) | 21 | 38.14286 | 34.01767 | 42.26805 | 40 | 801 | 22 | 54 | 30 | 42 | 32 | 12 | 82.12857 | 9.062482 | 1.977596 | -0.02042 | 0.501195 | -0.42602 | 0.971941 |
| TKN (mg/l as N) | 20 | 0.465 | 0.342321 | 0.587679 | 0.4 | 9.3 | 0.2 | 1.1 | 0.3 | 0.55 | 0.9 | 0.25 | 0.068711 | 0.262127 | 0.058613 | 1.321277 | 0.512103 | 0.877429 | 0.992384 |
| *E. coli* (CFU/100ml) | 78 | 434.1026 | 255.234 | 612.9711 | 105 | 33860 | 5 | 5000 | 30 | 420 | 4995 | 390 | 629374.5 | 793.3313 | 89.82708 | 3.327131 | 0.272211 | 14.33398 | 0.538176 |
| TOC (mg/l) | 21 | 2.157143 | 1.842574 | 2.471712 | 1.8 | 45.3 | 1.2 | 4.1 | 1.7 | 2.4 | 2.9 | 0.7 | 0.477571 | 0.691065 | 0.150803 | 1.35376 | 0.501195 | 1.842188 | 0.971941 |
| Hardness (mg/l) | 82 | 288.4756 | 276.9665 | 299.9847 | 305.5 | 23655 | 124 | 361 | 268 | 322 | 237 | 54 | 2743.66 | 52.37996 | 5.784399 | -1.276 | 0.265724 | 1.161335 | 0.525618 |
| Chloride (mg/l) | 21 | 28 | 24.73019 | 31.26981 | 28 | 588 | 17 | 41 | 22 | 32 | 24 | 10 | 51.6 | 7.183314 | 1.567528 | 0.322938 | 0.501195 | -0.7054 | 0.971941 |
| Dissolved Oxygen (mg/l) | 64 | 9.925 | 9.510322 | 10.33968 | 9.85 | 635.2 | 7 | 13.6 | 8.42 | 10.995 | 6.6 | 2.575 | 2.755895 | 1.660089 | 0.207511 | 0.333303 | 0.299327 | -0.54095 | 0.590491 |
| pH | 65 | 8.003846 | 7.904725 | 8.102968 | 8.04 | 520.25 | 6.9 | 10.04 | 7.83 | 8.18 | 3.14 | 0.35 | 0.160021 | 0.400026 | 0.049617 | 1.431028 | 0.297116 | 10.49962 | 0.586236 |
| Copper (ug/l) | 24 | 2.608333 | 2.005875 | 3.210792 | 2 | 62.6 | 2 | 6.9 | 2 | 2 | 4.9 | 0 | 2.03558 | 1.426737 | 0.291232 | 2.146878 | 0.472261 | 3.361861 | 0.917777 |
| Iron (ug/l) | 23 | 792.4783 | 402.5461 | 1182.41 | 430 | 18227 | 69 | 3400 | 220 | 1000 | 3331 | 780 | 813095.6 | 901.7182 | 188.0212 | 1.717166 | 0.481337 | 2.237574 | 0.934764 |
| Zinc (ug/l) | 24 | 6.53125 | 4.89265 | 8.16985 | 5.95 | 156.75 | 2.25 | 17 | 2.25 | 8.6 | 14.75 | 6.35 | 15.05844 | 3.88052 | 0.792108 | 0.928271 | 0.472261 | 1.024238 | 0.917777 |

# APPENDIX B

## FLATROCK- HAW CREEK
## WATERS ASSESSED IN THE
## CLEAN WATER ACT SECTION 305(B) REPORT

**SECTION 305(B) 2000**

| Waterbody ID | Hydrologic Unit | Segment name | Size (mi.) | YEAR 303D | Aquatic Life Support | Drinking Water Supply | Fish Consumption | Primary Contact (Recr) | Biotic comm. status | Copper | Cyanide | Lead | Mercury | Organic enrichment/ Low DO | Pathogens | PCBs | Pesticides | Priority organics | Salinity/TDS/chlorides | Unionized ammonia | Assess date yyyy mmdd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INW051_00 | | Flatrock River - Headwaters to Shankatank Cr | 75.98 | | F | | X | X | | | | | | | | | | | | | |
| INW051_T1001 | | Flatrock River - Rush Co. line to Shankatank Cr | 10.81 | 1998 | F | | P | X | | | | | S | | | | | | | | 19980401 |
| INW052_00 | | Flatrock River - tributaries | 47.49 | | F | | X | X | | | | | | | | | | | | | |
| INW052_T1002 | | Flatrock River - Mainstem | 27.91 | 1998 | F | | P | X | | | | | S | | | | | | | | 19980401 |
| INW053_00 | | Little Flatrock River basin | 48.04 | | F | | X | X | | | | | | | | | | | | | |
| INW054_00 | | Flatrock River - below Greensburg water intake | 69.81 | 1998 | F | | X | X | | | | | | | | | | | | | |
| INW054_T1003 | | Flatrock River - below Greensburg water intake | 6.78 | 1998 | F | | P | X | | | | | M | | | M | | | | | 19980401 |
| INW054_T1007 | 05120205040010 | Flatrock River - above Greensburg water intake | 2.10 | 1998 | F | X | P | X | | | | | M | | | M | | | | | 19980401 |
| INW055_00 | | Tributaries | 85.61 | | F | | X | X | | | | | | | | | | | | | |
| INW055_T1004 | | Flatrock River - mainstem above Sidney Br | 18.72 | 1998 | F | | P | N | | | | | M | | S | M | | | | | 19980401 |
| INW055_T1005 | | Flatrock River mainstem - Sidney Br to White R | 14.57 | 1998 | F | | X | N | | | | | | | S | | | | | | 19980401 |
| INW056_00 | | Haw Creek watershed | 48.08 | | F | | X | F | | | | | | | | | | | | | |
| INW056_T1006 | 05120205060010 | White River, EF - Columbus | 1.94 | 1998 | F | | P | F | | | | | | | | M | | | | | 19980401 |

Uses: F-Full support,P-Partial support,N-nonsupport,X-Not assessed,A-Not Attainable
Cause/ Stressormagnitude: S-slight,M-moderate,H=high,T-Not impaired;more information needed.
*Biological community response;stressor not identified.

# APPENDIX C

# Potential Stakeholders in the Flatrock- Haw Creek Watershed

# Potential Stakeholders in the Flatrock- Haw Creek Watershed

Bartholomew County Comm
440 3rd St # 101
Columbus, IN 47201
812/ 379-1515

Bartholomew County Engineer
2452 State St
Columbus, IN 47201
812/ 379-1662

Bartholomew County Extension
1971 State St
Columbus, IN 47201
812/ 379-1665

Bartholomew County Health
1971 State St
Columbus, IN 47201
812/ 379-1555

Bartholomew County Planning
123 Washington St # 8
Columbus, IN 47201
812/ 376-2550

Bartholomew Environmental Hlth
440 3rd St # 303
Columbus, IN 47201
812/ 379-1550

Bartholomew Surveyor Office
440 3rd St # 400
Columbus, IN 47201
812/ 379-1525

City Planning Dept
123 Washington St # 8
Columbus, IN 47201
812/ 376-2550

Columbus Community Development
123 Washington St # 9
Columbus, IN 47201
812/ 376-2520

Columbus Engineer
123 Washington St
Columbus, IN 47201
812/ 376-2540

Columbus Mayor's Office
123 Washington St
Columbus, IN 47201
812/ 376-2500

Columbus Utilities Dept
1111 Mcclure Rd
Columbus, IN 47201
812/ 372-8861

Bartholomew County SWCD
2314 State Street
Columbus, IN 47201-7346
812/ 378-1280

Fayette County Cooperative Svc
111 W 4th St
Connersville, IN 47331
765/ 825-8502

Fayette County Health Dept
111 W 4th St # 109
Connersville, IN 47331
765/ 825-4013

Fayette County Surveyor
111 W 4th St
Connersville, IN 47331
765/ 825-7466

Fayette Planning Commission
111 W 4th St
Connersville, IN 47331
765/ 825-9808

Fayette County SWCD
2590 North Park Road
Connersville, IN 47331-3040
765-825-2331

Geneva City Water Trtmnt
5th St
Geneva, IN 46740
219/ 368-9146

Decatur County Area Plan Comm
150 Courthouse Sq # 117
Greensburg, IN 47240
812/ 663-8451

Decatur County Board Of Health
801 N Lincoln St
Greensburg, IN 47240
812/ 663-8301

Decatur County Extension Svc
545 S County Road 200 W
Greensburg, IN 47240
812/ 663-8388

Decatur County SWCD
108 Smith Road
Greensburg, IN 47240-8217
812-663-8674

Henry County Farm Svc Agen
146 E County Road 200 N # B
New Castle, IN 47362
765/ 529-2303

Big Blue River Conservancy
1224 1/2 Broad St
New Castle, IN 47362
765/ 529-7254

Building Comm Office
227 N Main St
New Castle, IN 47362
765/ 521-6823

Henry County Co-Op Ext Agents
206 S 12th St
New Castle, IN 47362
765/ 529-5002

Henry County Commissioners
101 S Main St
New Castle, IN 47362
765/ 529-4705

Henry County Surveyor
111 S 12th St
New Castle, IN 47362
765/ 529-4802

Henry Planning Commission
107 1/2 S 12th St
New Castle, IN 47362
765/ 529-7408

New Castle Mayor
227 N Main St
New Castle, IN 47362
765/ 529-7605

New Castle Sewage Treatment
10 Midway Dr
New Castle, IN 47362
765/ 521-6836

Prairie Township Trustee
5492 N County Road 100E
New Castle, IN 47362
765/ 836-4249

Henry County SWCD
146 East Co. Rd 200 North Suite C
New Castle, IN 47362
765/-529-2303

IDNR Div. of Soil
146 East Co. Rd 200 North Suite C
New Castle, IN 47362
765/-529-2303

USDA Natural Resources Conservation Service
146 East Co. Rd 200 North Suite C
New Castle, IN 47362
765/-529-2303

Rush County Area Planning
101 E 2nd St # 211
Rushville, IN 46173
765/ 932-3090

Rush County Co-Op Extension
Courthouse # 103
Rushville, IN 46173
765/ 932-5974

Rush County Commissioner's Ofc
102 N Main St
Rushville, IN 46173
765/ 932-3791

Rush County Health Office
Ct House Room 5
Rushville, IN 46173
765/ 932-3103

Rush County Sanitarian's Ofc
106 N Main St # 5
Rushville, IN 46173
765/ 932-2216

Rush County Surveyor's Office
102 N Main St
Rushville, IN 46173
765/ 932-3184

US Army Corps Of Engineers
115 N Julian St
Rushville, IN 46173
765/ 938-4169

US Consolidated Farm Svc Agcy
144 E US Highway 52
Rushville, IN 46173
765/ 932-2813

Rush County SWCD
146 East U.S. Hwy 52
Rushville, IN 46173-9801
765/ 932-2813

Shelby Cooperative Extension
1110 Amos Rd # D
Shelbyville, IN 46176
317/ 392-6460

Shelby County Commissioner
25 W Polk St # 206
Shelbyville, IN 46176
317/ 392-6330

Shelby County Health Dept
1600 E State Road 44 # B
Shelbyville, IN 46176
317/ 392-6470

Shelby County Plan Commission
1600 E State Road 44 # A
Shelbyville, IN 46176
317/ 392-6338

Shelby County Surveyor
1600 E State Road 44 # A
Shelbyville, IN 46176
317/ 392-6481

Shelbyville Animal Shelter
705 Hale Rd
Shelbyville, IN 46176
317/ 392-5127

Shelbyville City Engineer
44 W Washington St
Shelbyville, IN 46176
317/ 398-6624

Shelbyville City Planning Comm
44 W Washington St
Shelbyville, IN 46176
317/ 392-5102

Shelbyville Mayor's Office
44 W Washington St
Shelbyville, IN 46176
317/ 398-6624

Shelbyville Sanitation Dept
44 W Washington St
Shelbyville, IN 46176
317/ 398-6624

Shelbyville Sewage Dept
44 W Washington St
Shelbyville, IN 46176
317/ 392-5104

Shelbyville Wastewater Trtmnt
775 W Boggstown Rd
Shelbyville, IN 46176
317/ 392-5131

Shelby County SWCD
1110 Amos Road, Suite C
Shelbyville, IN 46176-2806
317/ 392-1394

**STATE STAKEHOLDERS**

Indiana Farm Bureau Inc.
225 S East St
Indianapolis, IN 46202
(317) 692-7851

Indiana Department of Environmental Management
100 N. Senate Ave
P.O. Box 6015
Indianapolis, IN 46206-6015

IDEM Switchboard
(317) 232-8603 or (800) 451-6027

Agricultural Liaison
(317) 232-8587

Air Management
(317) 233-0178

Community Relations
(317) 233-6648

Compliance and Technical Assistance
(317) 232-8172

Criminal Investigations
(317) 232-8128

Enforcement
(317) 233-5529

Environmental Response
(317) 308-3017

Legal Counsel
(317) 232-8493

Media and Communication Services
(317) 232-8560

Pollution Prevention and Technical Assistance
(317) 232-8172

Solid and Hazardous Waste Management
(317) 233-3656

Water Management
(317) 232-8670

Indiana Department of Natural Resources
402 West Washington Street
Indianapolis, IN 46204-2748

IDNR, Division of Soil Conservation, Field Representatives are generally located with the SWCD office in each county.
Division of Engineering
(317) 232-4150

Division of Entomology and Plant Pathology
(317) 232-4120

Division of Fish & Wildlife
(317) 232-4080

Division of Forestry
(317)-232-4105

Division of Historic Preservation & Archaeology
(317) 232-1646

Division of Law Enforcement
(317) 232-4010

Division of State Parks and Reservoirs
(317)-232-4124

Division of Water
(317)-232-4160

Division of Public Information and Education
(317) 232-4200

Division of Reclamation
(317)-232-1547

Division of Safety and Training
(317) 232-4145

Division of Soil Conservation
(317)-233-3870

Division of Oil and Gas
(317) 232-4055

Division of Outdoor Recreation
(317)-232-4070

Division of Nature Preserves
(317)-232-4052

Indiana State Department of Health
2 North Meridian St.
Indianapolis, IN 46204
(317) 233-1325

FEDERAL STAKEHOLDERS

Natural Resources
Conservation Service
6013 Lakeside Blvd
Indianapolis, In 46278
(317) 290-3200

*NRCS Field Representatives are generally located with the SWCD office in each county.*

U.S. EPA Region 5
77 West Jackson Blvd
Chicago, IL 60604
(312) 353-2000
(800) 632-8431

# APPENDIX D

# FUNDING SOURCES

# FUNDING SOURCES

This listing of funding sources was derived from the November 1998 *Watershed Action Guide for Indiana*, which is available from the Watershed Management Section of IDEM.

## FEDERAL CONSERVATION AND WATERSHED PROGRAMS

*Environmental Protection Agency*

Section 319, 604(b), and 104(b)3 Grants

Grants for conservation practices, water body assessment, watershed planning, and watershed projects. Available to non-profit or governmental entities. These monies, enabled by the Clean Water Act, are funneled through the Indiana Department of Environmental Management. *For details see IDEM below*.

*U.S. Department of Agriculture (See county listings for local federal agency contacts.)*

**EQIP**: Environmental Quality Incentive Program. Administered by the Natural Resources Conservation Service. Conservation cost-share program for implementing Best Management Practices, available to agricultural producers who agree to implement a whole-farm plan that addresses major resource concerns. Up to $50,000 over a 5- to 10-year period. Some parts of the state are designated Conservation Priority Areas and receive a larger funding allotments.

**WRP**: Wetland Reserve Program. Administered by the Natural Resources Conservation Service. Easement and restoration program to restore agricultural production land to wetland. Easements may be for 10 years, 30 years, or permanent. Longer easements are preferred. Partnerships with other acquisition programs are encouraged. Restoration and legal costs are paid by NRCS. Landowner retains ownership of the property and may use the land in ways that do not interfere with wetland function and habitat, such as hunting, recreational development, and timber harvesting.

**CRP**: Conservation Reserve Program. Administered by the Farm Service Agency with technical assistance from NRCS. Conservation easements in certain critical areas on private property. Agricultural producers are eligible. Easements are for 10 or 15 years, depending on vegetative cover, and compensation payments are made yearly to replace income lost through not farming the land. Cost share is available for planting vegetative cover on restored areas.

**WHIP**: Wildlife Habitat Incentive Program. Administered by the Natural Resources Conservation Service. Cost share to restore habitat on previously farmed land. Private landowners who are agricultural producers are eligible. Cost share up to 75%, and contracts are for 10 years.

**FIP**: Forestry Incentive Program. Administered by the Natural Resources Conservation Service. Cost-share to assist forest management on private lands. Funds may be limited.

*U.S. Fish & Wildlife Service*

**Partners for Wildlife**: assistance for habitat restoration.

## STATE CONSERVATION AND WATERSHED PROGRAMS

*IDNR Division of Soil Conservation*

**LARE**: Lake & River Enhancement Program. Funds diagnostic and feasibility studies in selected watersheds and cost-share programs through local Soil & Water Conservation Districts. Project oversight provided through county-based Resource Specialists and Lake & River Enhancement Watershed Coordinators. Funding requests for Watershed Land Treatment projects must come from Soil & Water Conservation Districts. If a proposed project area includes more than one district, the affected SWCDs should work together to develop an implementation plan. The SWCDs should then apply for the funding necessary to administer the watershed project. Before applying for funding, the SWCDs should contact the Lake & River Enhancement Coordinators to determine (1) the appropriate watershed to include in the project, (2) if the proposed project meets the eligibility criteria, and (3) if funding is available.

*IDNR Division of Fish & Wildlife*

**Classified Wildlife Habitat Program**: Incentive program to foster private wildlife habitat management through tax reduction and technical assistance. Landowners need 15 or more acres of habitat to be eligible. IDNR provides management plans and assistance through District Wildlife Managers. See county listings.

**Wildlife Habitat Cost-share Program**: Similar to above.

*IDNR Division of Forestry*

**Classified Forest Program**: Incentive program to foster private forest management through tax reduction and technical assistance. Landowners need 10 or more acres of woods to be eligible. IDNR provides management plans and assistance through District Foresters. (See county listings.)

**Classified Windbreak Act**: Establishment of windbreaks at least 450 feet long adjacent to tillable land. Provides tax incentive, technical assistance through IDNR District Foresters.

**Forest Stewardship Program & Stewardship Incentives Program**: Cost share and technical assistance to encourage responsibly managed and productive private forests.

*IDNR Division of Reclamation*

**Appalachian Clean Streams Initiative:** Funds for acid mine drainage abatement.

*IDNR Division of Nature Preserves*

**State Nature Preserve Dedication**: Acquisition and management of threatened habitat.

*IDEM Office of Water Management*

**State Revolving Fund**: Available to municipalities and counties for facilities development. Will be available in 1999 for nonpoint source projects as well. Funding is through very low-interest loans.

**Section 319 Grants**: Available to nonprofit groups, municipalities, counties, and institutions for implementing water quality improvement projects that address nonpoint source pollution concerns. Twenty-five percent match is required, which may be cash or in-kind. Maximum grant amount is $112,500. Projects are allowed two years for completion. Projects may be for land treatment through implementing Best Management Practices, for education, and for developing tools and applications for state-wide use.

**Section 205(j) Grants, formerly called 604(b) Grants**: Available to municipalities, counties, conservation districts, drainage districts. These are for water quality management projects such as studies of nonpoint pollution impacts, nonagricultural NPS mapping, and watershed management projects targeted to Northwest Indiana (including BMPs, wetland restoration, etc.)

**Section 104(b)(3) Grants**: These are watershed project grants for innovative demonstration projects to promote statewide watershed approaches for permitted discharges, development of storm water management plans by small municipalities, projects involving a watershed approach to municipal separate sewer systems, and projects that directly promote community based environmental protection. NOTE: the application time frame for IDEM grant programs is annually, by March 31$^{st}$.

## PRIVATE FUNDING SOURCES

*National Fish and Wildlife Foundation*

1120 Connecticut Avenue, NW Suite 900, Washington DC 20036. Nonprofit, established by Congress 1984, awards challenge grants for natural resource conservation. Federally appropriated funds are used to match private sector funds. Six program areas include wetland conservation, conservation education, fisheries, migratory bird conservation, conservation policy, and wildlife habitat.

*Individual Utilities*

Check local utilities such as IPALCO, CINergy, REMC, NIPSCO. Many have grants for educational and environmental purposes.

*Indiana Hardwood Lumbermen's Association*

Indiana Tree Farm Program

*The Nature Conservancy*

*Land acquisition and restoration.*

Southern Lake Michigan Conservation Initiative
Blue River Focus Area
Fish Creek Focus Area
Natural Areas Registry
Hoosier Landscapes Capitol Campaign

*Conservation Technology Information Center (CTIC)*

*'Know Your Watershed'* educational materials are available

*Indiana Heritage Trust*

*Land acquisition programs*

*Ducks Unlimited*

*Land acquisition and habitat restoration assistance*

*Quail Unlimited*

*Pheasants Forever*

*Sycamore Land Trust*

*Acres Inc.*

*Land trust*

*Oxbow, Inc.*

*Land trust*

## SOURCES OF ADDITIONAL FUNDING OPPORTUNITIES

***Catalog of Federal Funding Sources for Watershed Protection***
EPA Office of Water (EPA841-B-97-008) September 1997

**GrantsWeb: http://www.srainternational.org/cws/sra/resource.htm**

# APPENDIX E

# FLATROCK RIVER WATERSHED MANAGEMENT PLAN

## December 1, 1997

Prepared by: Bec Wicker, Flatrock River Watershed Coordinator
Rush, Fayette & Henry County SWCD's
Flatrock River Steering & Flood Control Committees
Flatrock River Watershed Committee

## CONTENTS

**Flatrock River Watershed Plan**
**December 1, 1997**

## Introduction

The purpose of the Flatrock Watershed Coalition is to ensure the highest water quality possible, both stream and underground, for living in the Flatrock River Watershed. The goals of the coalition are to emphasize adult and youth education and to provide an avenue for voicing concerns and assessing needs in the watershed. The coalition is a decision making body of concerned citizens living in or affected by the watershed. At present, the group is a subcommittee of the Flatrock River Project steering committee. The Flatrock River Project has been instrumental in working to reduce flooding and to provide better drainage along a 23 mile section of the river in Rush County. The group consists of representatives from extension, Natural Resources Conservation Service, local government, small business, and watershed coordinator. The group meets as needed to work on specific projects concerning the watershed. The watershed plan was developed to provide continuity of the Flatrock River Project in Rush County and to transfer knowledge gained to other watershed counties and other watersheds in Rush County. The coalition developed a public survey that was distributed at local 4-H fairs, at the land Expo sponsored by Land Improvement Contractor's Association, and through the watershed newsletter. Public meetings were held and surveys were also distributed through the local newspaper prior to the beginning of the Flatrock River Project. The watershed area is clearly defined as covering areas of Henry, Fayette, Rush, Shelby, Decatur, and Bartholomew counties. (see Appendix A)

## Objectives

The Flatrock River Coalition developed goals and objectives based on needs expressed in Rush County and upper watershed counties (Henry and Fayette counties). These goals are to emphasize adult and youth education, to provide an 800 number for voicing concerns, to recommend funding resources, to conduct a needs assessment, and to maintain streambank stabilization programs.

## Inventory Resources

Data concerning the conditions of the Flatrock River and its watershed were compiled by the Flatrock River Project steering committee, state and federal agencies, local councils and boards, and local governments. Initial information was primarily concerned with flooding along the river in both county and city. Information on the quality of the water in the Flatrock River is continually being compiled by volunteer monitors using chemical, physical, and biological tests. This data is observed for changes or trends in the river water at various points in the county.

## Analyze

Priorities of the watershed have been established as streambank erosion control, wildlife habitat, good water quality, recreational opportunities, flood reduction, and better drainage. Evolvement of events over the past five years with the Flatrock River project has emphasized the need for maintenance of streambank stabilization projects and for long range

planning of the watershed use by the public. This also includes public accessibility to the river and establishing landowner rights and responsibilities.

**Make Decisions**

All Flatrock River project committee members and watershed coordinator have participated in Coordinator Resource Management (CRM) training sessions. CRM has been implemented in the Rush County project process and will continue to be used to achieve consensus on future watershed projects. Water quality will continue to be monitored by volunteers and documented through the Riverwatch program. At the conclusion of the Flatrock River Project, a maintenance plan will be formulated. This plan will include the suggestion of having a representative appointed by the steering committee or their board of supervisors to assess river conditions once each calendar year. If maintenance work is required, this representative will contact the board of supervisors to determine a course of action.

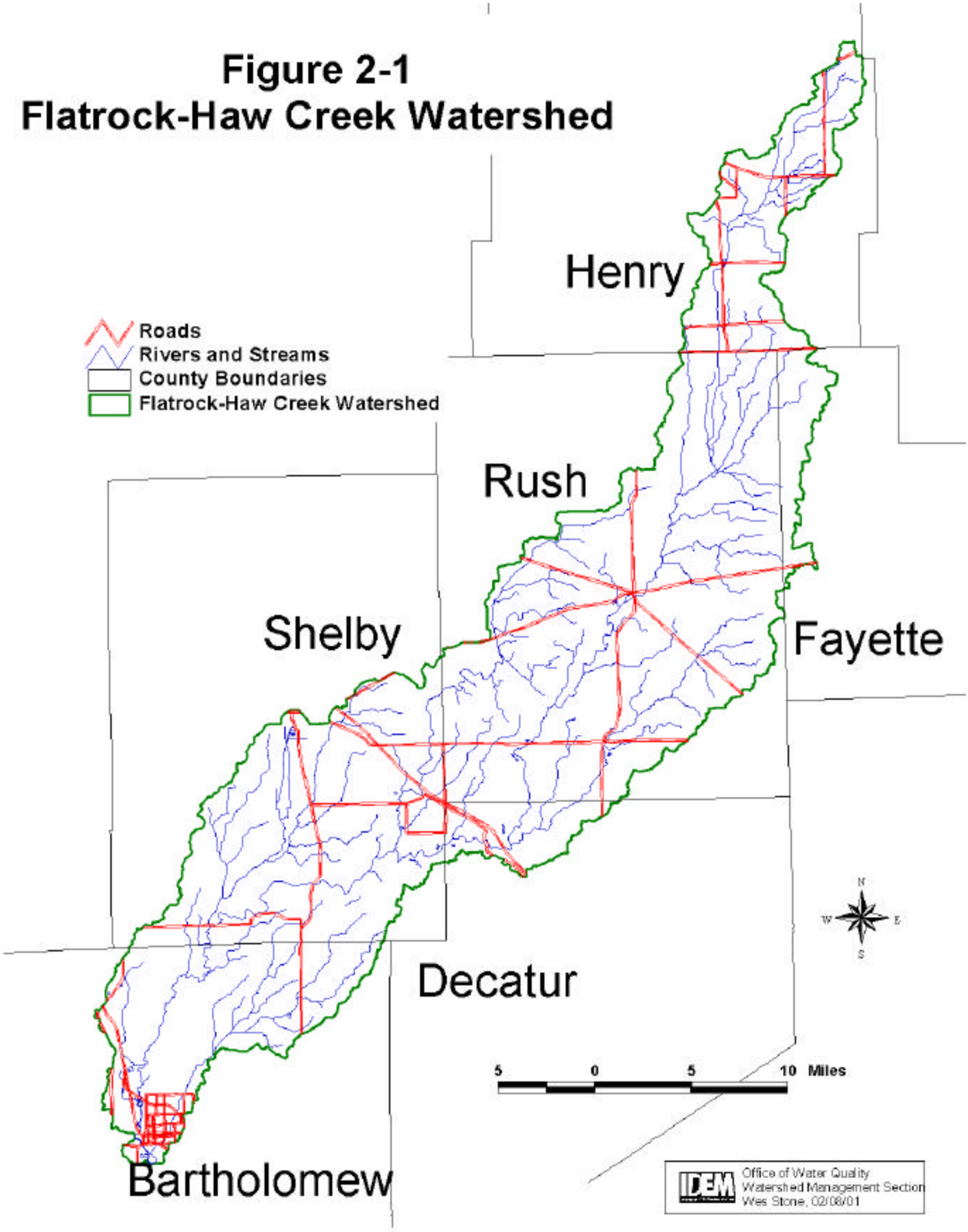
**Plan to Implement the Plan**

The watershed approach to resource management allows locally-led committees to consider resource conditions and trends of resources, prioritize issues, and develop solutions to address those issues. A local steering committee will determine an action plan that will address maintenance issues. The steering committee will encourage local landowners to accept responsibility for their portion of the watershed through continuing education efforts. State agencies will provide a needed informational resource. Information on watershed projects planned or in progress in other portions of the watershed can be provided locally by state agencies. The steering committee will continue to cooperate with conservation agencies to encourage the adoption and establishment of additional conservation practices and structures such as filter strips, buffer strips, riparian areas, grassed waterways, WASCOBs, and conservation tillage.

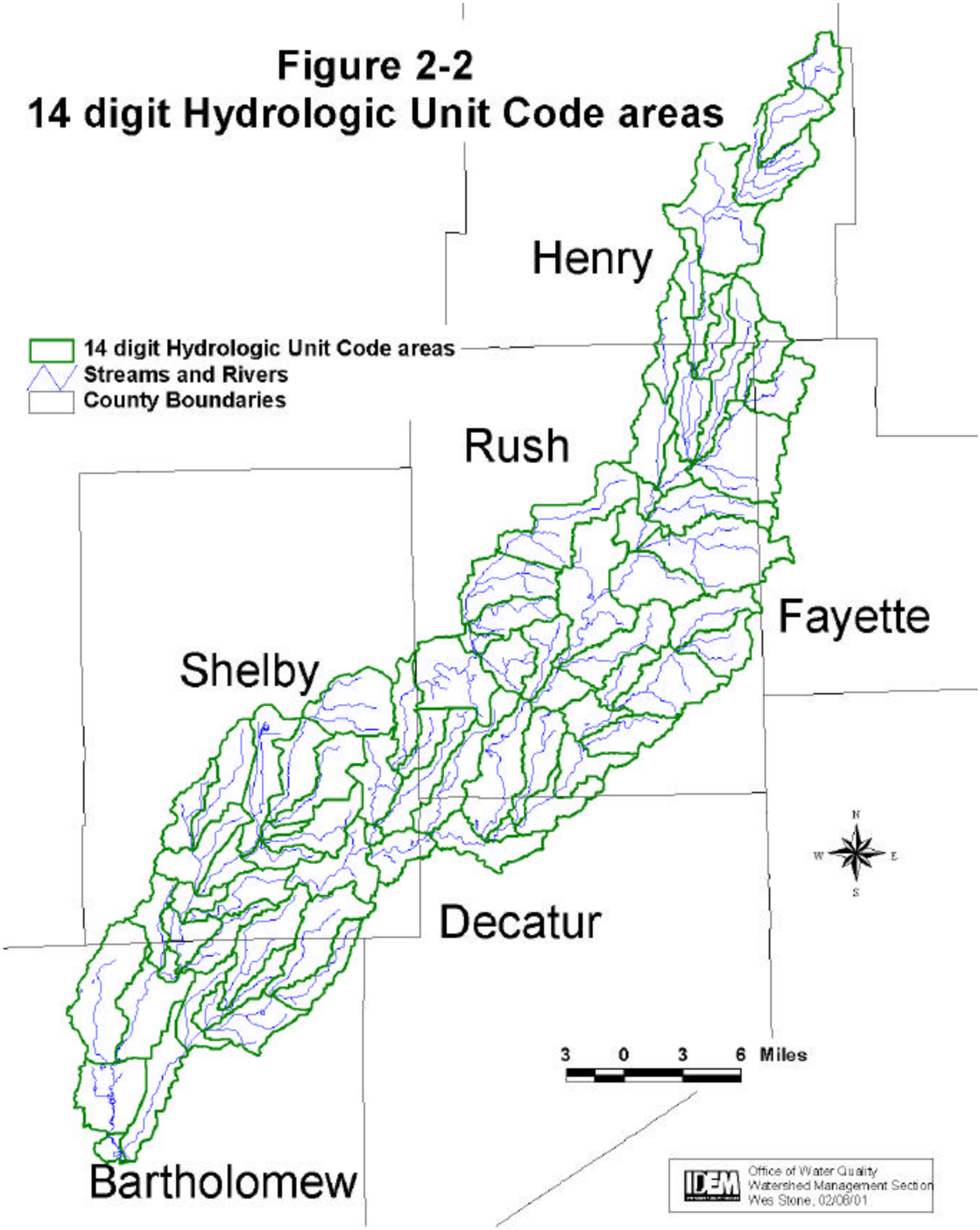
**Monitor**

The board of supervisors or its appointed representative will oversee the maintenance program established by the steering committee. The steering committee will suggest the representative submit a written report annually to involved agencies. The formal steering committee will have authority to address issues identified in the annual report and to decide appropriate action. Possible courses of action will be meeting with representatives of local government agencies and officials and state agencies with no action or corrective action taken.

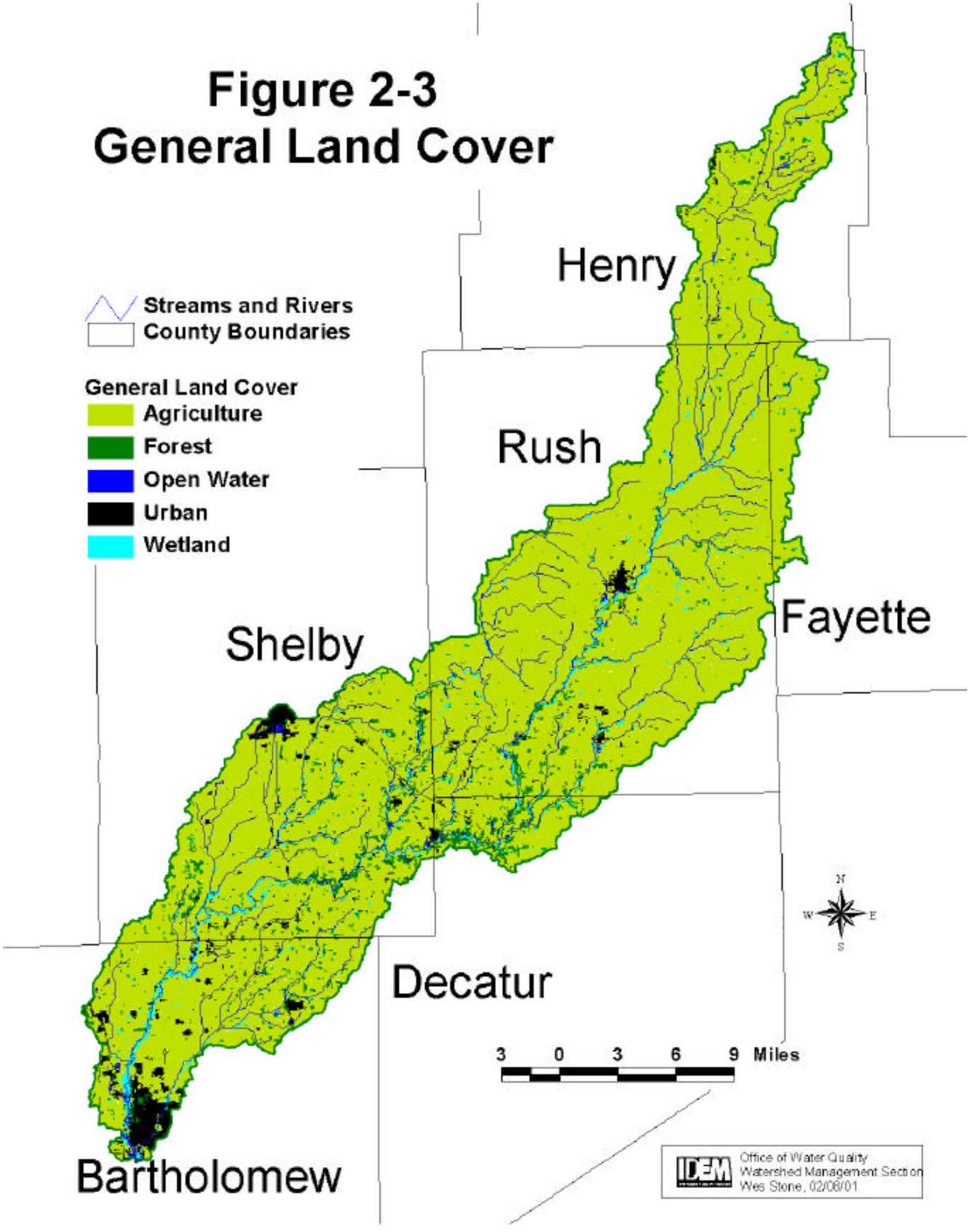
# Figure 2-1
# Flatrock-Haw Creek Watershed



# Figure 2-2
# 14 digit Hydrologic Unit Code areas



# Figure 2-3
# General Land Cover



# Figure 3-1
# NPDES Facilities