VFC Index - Watershed (Plan)

Program: Watershed

IDEM Document Type: Plan

Document Date:

Security Group: Public

Project Name: Upper Anderson River WMP

Plan Type: Watershed Management Plan

HUC Code: 05140201 Lower Ohio-Little Pigeon

Sponsor: Indiana 15 Regional Planning Commission

Contract #: 5-76

County: Dubois

Cross Reference ID: 21203847

Comments: Spencer, Perry

Additional WMP Information

Checklist: Does not Meet

Grant type: 205j

Fiscal Year: 2004

IDEM Approval Date:

EPA Approval Date:

Project Manager: Pamela Brown

Upper Anderson River Project
Watershed Management Plan

ARN A 305-5-76

Prepared by: Indiana 15 Regional Planning Commission
221 East First Street
Ferdinand, Indiana 47532
www.ind15rpc.org
(812) 367-8455

Funded by the Indiana Department of Environmental Management

12/22/2008

TABLE OF CONTENTS

1. INTRODUCING THE PROJECT……………………………………………………… 4

1.1: Project Location……………………………………………………………… 4
1.2: Background…………………………………………………………………… 4
1.3: Building Partnerships………………………………………………………… 7
1.4: Initial Concerns……………………………………………………………… 8
1.5: Partners………………………………………………………………………… 8

2. DESCRIBING THE WATERSHED………………………………………………… 8

2.1: Physical Description…………………………………………………………… 9
2.1.1: Soils…………………………………………………………………………… 9
2.1.2: Topography…………………………………………………………………… 9
2.1.3: Hydrology……………………………………………………………………… 9
2.1.4: Land Use……………………………………………………………………… 9

2.2: Cultural ……………………………………………………………………… 11
2.2.1: When Settled………………………………………………………………… 11
2.2.2: Historical Events…………………………………………………………… 11
2.2.3: Important Features ………………………………………………………… 12

3. ESTABLISHING BENCHMARKS…………………………………………………… 12

3.1 Locale…………………………………………………………………………… 12
3.1.1 Blackhawk Creek ……………………………………………………………… 12
3.1.2 Hurricane Creek - Ferdinand Run…………………………………………… 13
3.1.3 Hurricane Creek – Headwaters……………………………………………… 13
3.1.4 Background…………………………………………………………………… 13

3.2 Suspended Solids and Nutrients……………………………………………… 15
3.2.1 Dissolved Oxygen……………………………………………………………… 15
3.2.2 E. Coli…………………………………………………………………………… 15
3.2.3 Nitrogen, Nitrates, and Orthophosphates…………………………………… 16
3.2.4 pH……………………………………………………………………………… 17
3.2.5 Turbidity and Transparency ………………………………………………… 17
3.2.6 Water temperature …………………………………………………………… 17
3.2.7 Sampling ……………………………………………………………………… 17

4. IDENTIFYING PROBLEM, CAUSES, AND STRESSORS……………………… 18

5. IDENTIFYING SOURCES………………………………………………………… 18

6. IDENTIFYING CRITICAL AREAS ………………………………………………… 19

7. SETTING GOALS AND SELECTING INDICATORS 20

8. CHOOSING MEASURES TO APPLY 21

9. CALCULATING LOAD REDUCTIONS 21

10. IMPLEMENTING THE MEASURES 22

11. MONITORING INDICATORS 23

12. EVALUATING AND ADAPTING THE PLAN 23

REFERENCES 24

LIST OF FIGURES

Figure 1-1	Location Map..	4
Figure 1-2	Tree Planting Field Day..	6
Figure 1-3	Heritage Hills High School Students Collecting Data..........................	7
Figure 2-1	Illinois Basin Map..	10
Figure 3-1	Spencer County Intern Profiling Hurricane Creek	14
Table 3-1	Water Sampling Sites	15
Figure 3-2	E coli Culture Sample..	16
Table 3-2	Water Data Summary..	17
Table 5-1	Impairment Source Matrix...	19

APPENDICES

Appendix A:	Project Area Map
Appendix B:	Additional Stressors
Appendix C:	Land Use Matrix
Appendix D:	Stress Rating Matrix
Appendix E:	Soils Map
Appendix F:	Areas of Concern and Critical Areas Map
Appendix H:	Water Quality Data
Appendix I:	IDEM Water Quality Data
Appendix J:	Load Reductions, Concerns, and Goals Matrix
Appendix K:	Spreadsheet Tool for the Estimation of Pollutant Loads (STEPL)
Appendix L:	Meta Data – Water Quality Data
Appendix M:	Meta Data – Points

1. INTRODUCTION:

1.1 Location.

The Anderson River (8 Digit Hydrologic Unit Code [HUC] 05140201) is located in Southwestern Indiana with its headwaters in Crawford, Dubois, Perry, and Spencer Counties and emptying into the Ohio River west of the town of Troy, Indiana (See Figure 1-1 and Appendix A).

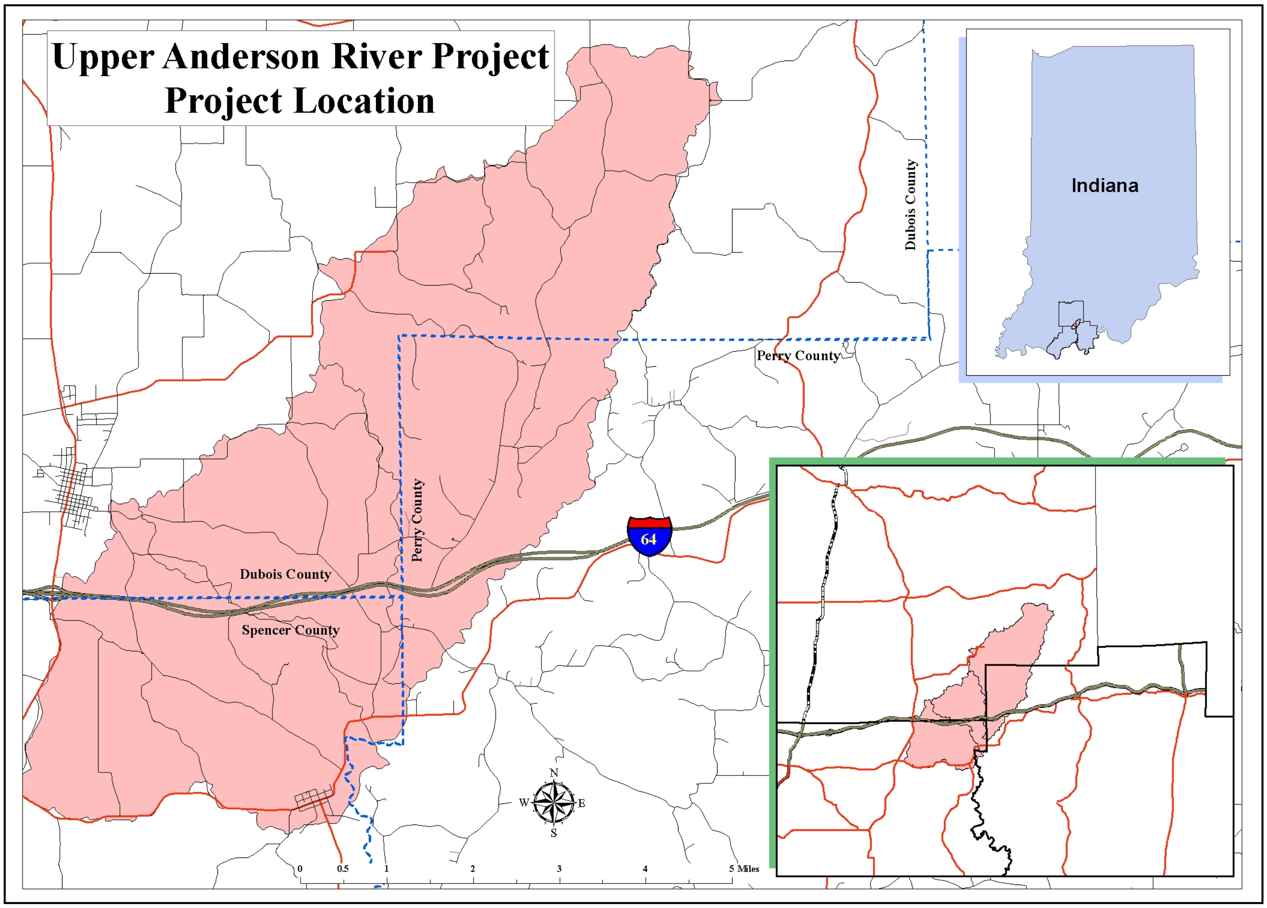

Figure 1-1 Location Map

1.2 Background.

Originally, the entire Anderson River Watershed was proposed for this project. However, the Indiana Department of Environmental Management wanted the project area decreased, so three sub-watersheds in the headwaters (Blackhawk Creek HUC 05140201070070, Hurricane Creek - Ferdinand Run HUC 05140201070060, and Hurricane Creek – Headwaters HUC 05140201070050) of the watershed were decided upon (See Appendix A).

While the project area is approximately 21,000 acres, Ferdinand State Forest comprises approximately 3,300 acres, thereby reducing the area threatened by agriculture and urban activities to approximately 18,700 acres.

In July, 1999 an ad hoc gathering of a half dozen or so citizens gathered at the St. Meinrad Arch Abbey Gift Shop in Spencer County. Among other things, the spring flooding of farm fields triggered the meeting. It was decided to schedule a public meeting to find out how many citizens in the watershed had serious concerns, and what kind. Additionally, they wanted to review what went wrong with an earlier conservancy plan.

The first public meeting drew 30 people on August 4, 1999. There were 7 public meetings through January 3, 2001. At the August 4th, 1999 meeting the following list of issues were prioritized:

- Money Available For Projects
- Flooding
- Ditch Maintenance
- Water Quantity
- Who Has Jurisdiction Of The Anderson River
- What Regulations And Requirements May Be Attached To Money
- Beaver
- Community Water Supplies
- Log Jams
- Water Velocity
- Multi-County Coordination
- Water Quality

From this humble beginning the Anderson River Improvement Association (ARIA) was formed with a vision statement of "**A Cleaner, Safer, Flowing River in an Enhanced Environment**." They developed the following goals:

- Remove log jams to improve water flow and lessen bank erosion
- Retain and detain runoff away from streams through best management practices of landscape and impoundments
- Encourage land use practices at the edge of streams to prevent erosion, e.g. filter strips, trees, and wetlands
- Monitor conditions of trees at stream edges and provide ongoing maintenance
- Research information on water quality/quantity, and develop ongoing assessment programs
- Search out all the funding sources available to the ARIA
- Define projects which can be funded

A Field Day was held on June 22, 2006 that focused on the role of trees in nutrient up-take, stream bank stabilization, and maintaining riparian zones.

Figure 1-2 Tree Planting Field Day

Six field trips were conducted where students from Heritage Hills High School in Lincoln City, Forest Park High School in Ferdinand, and Perry Central High School in Leopold were shown how to conduct water sampling and macroinverterbrate inventories.

Figure 1-3 Heritage Hills High School Students Collecting Data

On January 20, 2007 the project hosted a workshop that discussed flood plains, wetlands, and excavation in and around them as part of the program to educate citizens about erosion and its contribution to poor water quality.

1.3 Building Partnerships.

The Anderson River Improvement Association (ARIA) struggled for years to launch a viable project in the Anderson River watershed. The presence of Indiana 15 Regional Planning Commission (Indiana 15) provided a ready-made multi-county umbrella organization to move the project into an implementation phase. The partnership of the ARIA and Indiana 15 allowed for the preparation of a grant request to the Indiana Department of Environmental Management in 2004, which is funded this Watershed Management Plan project.

With Indiana 15 providing project management, a steering committee was formed with the ARIA being a core asset. Partnerships were formed with county Soil and Water Conservation Districts, the Natural Resources Conservation Services, Lincoln Hills Resources Conservation and Development Area and stakeholders. A basic tenet of the organization is that the project would be conducted in a benevolent manner. The consensus is that stakeholders will be more forthcoming in an inclusive environment.

A project kick-off meeting was held on April 22, 2005 at the St. Meinrad Community Center with stakeholders and IDEM personnel attending. The inaugural meeting was well attended even though farmers were rushing to complete their planting before storms set in.

Tom Mosley, the Project Coordinator, gave an overview of the project and goals. Pam Brown and Bonny Elifritz of the Indiana Department of Environmental Management (IDEM) provided insight and guidance on the project, which is sponsored and funded by IDEM.

1.4 Initial Concerns:

Over the period of the project, stakeholders met several times to produce a concise and formal list of concerns:

Concern: **High E. coli levels in the upper portion of the Anderson River Watershed**

Concern: **High erosion and sedimentation levels in the upper portion of the Anderson River watershed**

Concern: **Excessive periodic flooding in the upper portion of the Anderson River watershed**

Concern: **Contaminants from vehicular traffic, impervious surfaces (parking lots and driveways) and industrial transportation spills in the upper portion of the Anderson River watershed**

1.5 Partners:

Many organizations have participated to varying degrees in this project. Some of the more helpful are:

Dubois County Soil and Water Conservation District.
Perry County Soil and Water Conservation District.
Spencer County Soil and Water Conservation District.
Natural Resources Conservation Services – U. S. Department of Agriculture
Lincoln Hills Resources Conservation and Development Area – U. S. Department of Agriculture

2. DESCRIPTION OF THE WATERSHED:

2.1. Physical Description.

2.1.1 Soils: Soil types in the watershed are predominately comprised of Gilpin-Berks defined as well-drained, strongly sloping to very steep soils formed from sandstone residuum on the side slopes of the uplands; Cuba-Hammond defined as well-drained, nearly level soils formed from medium textured alluvium in the bottoms and low terraces; Zanesville-Tilsit defined as moderately well-drained, gently sloping to moderately sloping soils formed from loess over sandstone residuum; and Markland-McGary on the terraces near the mouth of the Anderson River as somewhat poorly-drained soils formed from fine textured lacustrine materials (See Appendix E). The nature of these soil associations and the topography of the sub-watersheds within the Anderson River drainage creates erodable to highly-erodable crop and pasture lands, unstable riverbanks and subsequent tree-falls which further contribute to stream siltation, flooding problems and crop losses.

2.1.2 Topography: The project area is located on the far eastern edge of the Illinois Basin which is on the Kankakee Branch of the geologic Precambrian Cincinnati Arch, and is characterized by timbered steep slopes, narrow pastured or row-cropped valleys with eroding gullies, and unstable riverbanks. Log jams in segments of the river, and periodic flash flooding cause road and field damage, crop losses, and isolation of residences from road access and emergency services. Sedimentation, fertilizers, pesticides and manure all intermittently affect the quality of water within the Anderson River and the ecosystem as a whole (See Appendix F).

2.1.3 Hydrology: Though the Middle Fork of the Anderson River has an established conservancy district and flood-control impoundments, the main channel of the Anderson River has no conservancy district or flood control impoundments.

2.1.4 Land use: By referring to Appendix C, it is obvious that the project area is overwhelmingly rural with cropland at approximately 23.1%, forests at approximately 38%, and pasture occupying approximately 37%. Ferdinand State Forest at some 3,300 acres is about 18% of the project area. Developed land accounts for less that 1%.

2.1.4.1 Agriculture and logging practices have changed and improved over time, but still contribute to water quality problems and in some cases cause unstable riverbanks. Confined Animal Feeding Operations (CAFOs) are becoming more numerous as well. And while the Indiana Department of Environmental Management has some permitted sites in the area (See Appendix B), operations that do not fall within the scope of CAFOs are increasing in number and size.

2.1.4.2 The project area lies on the far eastern edge of the Illinois basin with coal, gas and oil reserves. Gas and oil wells have provided income for many years, but have resulted in petroleum seepages from time-to-time that affects water quality. While there are coal strip mines in the area of Santa Claus to the west, there has been no coal mined in the project area.

Figure 2-1 Illinois Basin

2.1.4.3 Recreational activities such as hiking, camping, and fishing abound in the area in the Hoosier National Forest and Ferdinand State Forest (See Appendix A). Additionally, private areas support these outdoor activities as well as off-road vehicle riding. Occasionally, the vehicle operators like to drive in the stream channels, which can cause increased erosion (See Appendix G). Other sections of this plan will continually make reference to Appendix G, which shows the area of concerns

2.1.4.4 Saint Meinrad is the only true urban area in the project area, but concentrated development has not been an issue to date. None-the-less, individual homes are continually creeping into the area, with the associated environmental impacts such as septic systems and vehicle lubricants.

2.1.4.5 There are no legal drains in the project area, but individuals on occasion clear stream banks and excavate in streams to increase local drainage. Likewise, driving vehicles through the stream channels is undertaken rather than constructing bridges (See Appendix G).

2.2 Cultural.

2.2.1 When settled:

Dubois County was formed in 1818 and is named for Toussaint Dubois, a Frenchman who fought in the Revolutionary War, the Battle of Tippecanoe, and the War of 1812. Dubois was a merchant who lived mainly in Vincennes. He drowned in 1816 while crossing the Little Wabash River near Lawrenceville, Illinois.
The original county seat was Portersville. In 1830 the county seat was moved south to Jasper.

Perry County was formed in 1814. It is named for Commodore Oliver Hazard Perry who defeated the British squadron in the decisive Battle of Lake Erie in 1813. Mr. Adam Shoemaker who taught Abraham Lincoln is buried in the Cox Shoemaker Cemetery on Cougar Road within the watershed. He also founded a church on Hurricane Creek, but nothing remains of the church. The county seat is in Tell City.

In 1818 Captain Spier Spencer, who was killed at the Battle of Tippecanoe, settled Spencer County. Abraham Lincoln lived in Spencer County from 1816 to 1830, between the ages of seven and twenty-one. His family moved to Illinois in 1830. The Lincoln Boyhood National Memorial is located at the site of the Lincoln family farm. The county seat is in Rockport.

Saint Meinrad Arch Abbey was founded in 1854 by monks from Einsiedeln Abbey in Switzerland. They came to southern Indiana at the request of a local priest for assistance in addressing the pastoral needs of the growing German-speaking Catholic population and to prepare local men to be priests.

Shortly after arriving in Indiana, the Benedictines began offering high school courses to local youths. In 1861, the monks expanded their general courses to include undergraduate courses in philosophy and theology. Through these programs, the monks of Saint Meinrad began their mission, which continues today: preparing men for service in the Church as priests. The Abbey is a prominent structure within the watershed.

2.2.2 Historical events:

Interstate 64, was constructed over 40 years ago and altered the natural water channels and drainage. Likewise, the presence of some six miles of interstate presents a distinct potential hazard from contaminants and spills.

In the early 1970s there was a failed attempt to research the need for a series of flood-control impoundments throughout the entire watershed, with only the Middle Fork successfully addressed. Therefore, beyond the evident water quality problems, there is also an unsuccessful past effort to comprehensively address the issues affecting the entire Anderson River Watershed.

2.2.3 Important features:

Saint Meinrad Arch Abbey owns and operates an international company that produces and markets religious, spiritual and inspirational cards, books and gifts. Abbey Press is one of the largest business enterprises in Spencer County, Indiana, with more than 300 employees.

It was begun in 1867 when the Benedictine monks purchased a used printing press. Although primarily used for in-house printing needs, the monks recognized the opportunity of spreading its ministry beyond the printed word in the 1960s.
Today, Abbey Press markets its products throughout the United States and in 25 English-speaking countries.

The small chapel of Monte Casino is located on a hill near the Arch Abbey. Surrounded by trees and panoramic views of the Anderson Valley, the shrine is dedicated to the Virgin Mary. The history of Monte Casino Shrine tells how a novena to Our Lady of Monte Casino is credited for saving the village of St. Meinrad from a smallpox epidemic in 1871. Since the chapel's dedication in 1870, thousands of people have visited the sandstone chapel. Besides personal pilgrimages to the shrine, public pilgrimages are held as well.

3. ESTABLISHING BENCHMARKS:

3.1 Locale.

In order to arrive at a starting point, local stakeholders held public meetings, examined resource material such as the Geographic Information System, and conducted "windshield surveys." The windshield surveys were personal observations by citizens that are familiar with the area and which helped to develop the stress rating in Appendix D. The ***Resources Inventory & Priorities Plan*** was developed in December of 2002 with a grant solicited from the Unites States Forest Service. The stress ratings directly relate to observable conditions.

Stakeholders used data from past events as well as the ***Resources Inventory & Priorities Plan*** to organize their major concerns for the project area on a sub-watershed basis:

3.1.1 Blackhawk Creek

Severe flooding and erosion problems are evident where Blackhawk Creek crosses and runs adjacent to State Road 62.

Eighty percent (80%) of the Blackhawk Creek sub-watershed is used for livestock pastureland, small grain planting, and cropland. This presents concerns with animal feeding operations and herbicide and pesticide applications, especially during spring planting. Blackhawk Creek also has the largest urban density in the project area, which poses severe problems from poorly working septic systems.

3.1.2 Hurricane Creek - Ferdinand Run

Severe flooding occurs throughout the middle and lower reaches of this sub-watershed including a portion of Interstate 64.
Agricultural activities are split very evenly between forest, pasture, and crop uses.
Steep upland areas that flatten out relatively quickly may be causing higher than normal erosion problems.

3.1.3 Hurricane Creek – Headwaters

Significant flooding and erosion in lower portions of the sub-watershed occurs as it nears Interstate 64.
Poor livestock management efforts with confined animal feeding operations that appear to have caused water quality violations.
Upper areas of this sub-watershed are within the Ferdinand State Forest area, under management of the Indiana Department of Natural Resources. Privately held forestland also exists within the Hurricane Creek Headwaters.

3.1.4 Background

Kenneth J. Eck, Soil and Water Conservation Specialist of the Purdue Agronomy Department prepared an "*Introductory Soil Loss Data*" report for the Anderson River Watershed as of March 7, 2000. The report documents corn and soybean tillage types and average soil losses for 1996 and 1998. This report was prepared as a part of the ongoing efforts of the Anderson River Improvement Association to research the issues affecting water quality on the Anderson River.

As mentioned before, a ***Resources Inventory & Priorities Plan*** was prepared which has a "stress rating" for each watershed (See Appendix D).

Though the Middle Fork of the Anderson River has an established conservancy district and flood-control impoundments, the main channel of the Anderson River has no conservancy district, no watershed management plan, no flood impoundments, and no strategic plan to comprehensively address soil and water conservation, wetland restoration, riverbank stabilization, or public education programs to bring about improvements to the water quality of the river.

The Anderson River and tributaries were on the 2004, 303(d) list (#406) for E.coli.

The three sub-watersheds in this study were not assessed in the 2002, 305b report, but the report lists the Anderson River and tributaries as "Moderately" impaired and 'Non Supporting" for aquatic life support and primary contact.

The Perry County Soil and Water Conservation District has just concluded a Lake and River Enhancement (LARE) project for the entire Anderson River.

Water collection sites and schedules were selected to allow for a comprehensive overview of the project area over the two-year study period. (See Appendix H– Water Quality Data and the watershed map in Appendix A, and Appendix I – IDEM Water Quality Data). Additionally, sites were selected so that access was by public rights-of-way to prevent the trespass on private property.

Figure 3-1 Brian Oxley (Spencer Co. SWCD Intern) Helps Develop a Stream Profile

Table 3-1

Water Sampling Sites

Site	Basin Drainage	Location	State Plane Coordinates East	State Plane Coordinates North
1	Blackhawk Creek	State Road 62 – Spencer County	3032524	1065730
2	Hurricane Creek – Ferdinand Run	Ferdinand Road – Spencer County	3035363	1073163
3	Hurricane Creek – Entire Watershed	State Road 62 – Perry County	3034955	1069766
4	Hurricane Creek - Headwaters	Copper Road – Perry County	3037971	1075100
5	Hurricane Creek - Headwaters	Calvert Road – Perry County	3043232	1086250
6	ane Creek – Headwaters	Schnell Road – Dubois County	3046834	1099646

June 22, 2005 saw the first water data collected in accordance with a Quality Assurance Project Plan that was approved by IDEM on June 8, 2005. Constituents to be tested were decided upon in pre-project discussions based on realistic concepts of what could be expected and what would be reasonable to test for. Using the Indiana Department of Natural Resources' ***Volunteer Stream Monitoring Training Manual***, a test kit that included ammonia nitrogen, dissolved oxygen, pH, nitrate, and phosphates was used. The kit was supplemented by air temperature, water temperature, transparency, and laboratory testing of E. coli.

3.2 Suspended Solids and Nutrients.

3.2.1 Dissolved Oxygen: The amount of oxygen in water is called the dissolved oxygen (DO) concentration. DO is an important measure of stream health. Although oxygen atoms are present in the water molecule (H_2O), most aquatic life requires oxygen in the free element state (O_2) as a dissolved gas.

3.2.2 E. Coli: E. coli is a specific species of fecal coliform bacteria used in Indiana's state water quality standards. Some strains of E. coli can lead to illness in humans. Fecal coliform bacteria are found in the feces of warm-blooded animals, including humans, livestock, and waterfowl. These bacteria are naturally present in the digestive tracts of animals, but are rare or absent in unpolluted waters. Fecal coliform bacteria typically enter water via combined sewer overflows, poor septic systems, and runoff from agricultural feedlots. The bacteria can enter the body through the mouth, nose, ears, eyes, or cuts in the skin.

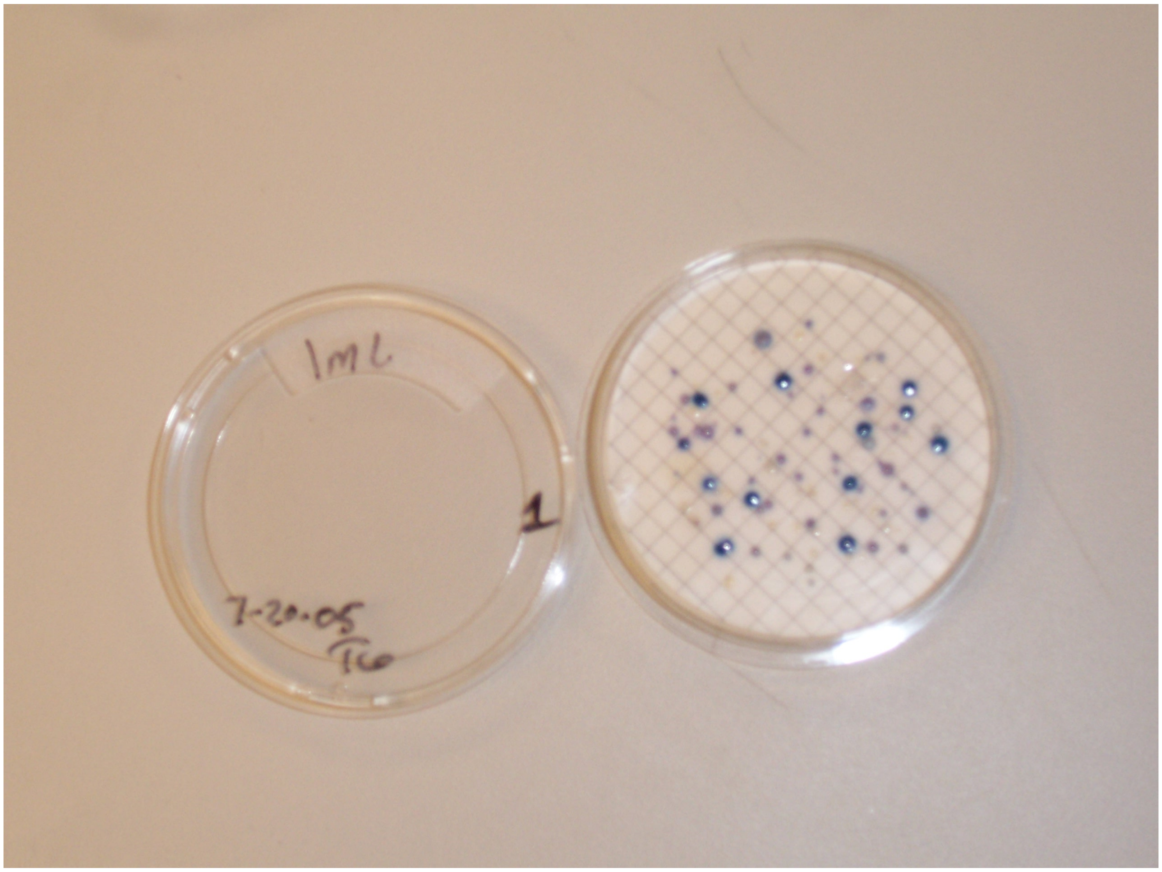

Figure 3-2   E. coli Culture Sample

3.2.3 Nitrogen, Nitrates, and Orthophosphates:

3.2.3.1 Nitrogen is an essential ingredient in the formation of proteins for cell growth. Excess nitrogen discharged into our waterways can contribute to eutrophication. The reaction of the aquatic system to an overloading of nutrients is known as eutrophication. Certain forms of nitrogen can cause specific problems too. Ammonia is toxic to fish, and nitrates at high enough dosages in the drinking water cause methemoglobinemia in infants (Nitrates convert to nitrites in the stomach. These nitrites then interfere with the oxygen-carrying capacity of the hemoglobin in blood).

3.2.3.2 Nitrates are a main ingredient in fertilizers and can lead to increased aquatic plant growth and eutrophication

3.2.3.3 Orthophosphates are one form of phosphates and can cause excessive plant growth. Plants begin to die and decompose, depleting the dissolved oxygen supply in the water – a condition called hypoxia, which can lead to fish kills.

3.2.4 pH – power of hydrogen – expresses the activity of the hydrogen ions in water. The relative concentration of hydrogen and hydroxide ions determines whether a solution is acidic or basic. The pH level is an important measure of water quality because aquatic organisms are sensitive to ph, especially during reproduction.

3.2.5 Turbidity and Transparency: Turbid water is cloudier and is caused by suspended mater including clay, silt, organic matter, and algae. Transparency measures the scattering of light, The scattering of light decreases photosynthesis which means organism in the water receive no light and water temperature increases due to light absorption.

3.2.6: Water temperature: Colder water can hold more dissolved oxygen than warmer water, and therefore has more macroinvertebrate diversity. Lower oxygen levels weaken fish and aquatic insects, making them more susceptible to illness and disease.

3.2.7 Sampling: This two-year project used repetitive testing under various conditions to establish base-line data for these components, which will be used for follow-on programs. No pre-conceived ideas were applied, but rather an open minded approach was taken to see what patterns developed. Table 3-2 summarizes the tabular data in Appendix H that was collected on a monthly basis.

Sampling began on June16, 2005 upon completion of the QAPP and continued through December 6, 2006. Sampling was conducted monthly in order to develop a seasonal pattern

Table 3-2

Water Data Summary

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Targets
Ammonia Nitrogen	**0.08**	0.04	0.02	0.02	0.01	0.01	0.5 mg/l
Dissolved Oxygen	8.60	8.90	9.00	7.90	8.70	9.40	5.4 mg/l – 14.2 mg/l
E. coli	**1425**	**800**	**1050**	**1450**	**350**	175	235 cfu/100 ml
Nitrate	**15.42**	6.23	5.5	5.99	7.21	9.41	< 10 mg/l
Orthophosphate	**0.09**	**0.03**	**0.07**	**0.05**	**0.04**	**0.05**	< 0.01 mg/l
pH	7.10	7.20	7.20	7.10	7.20	7.40	6.5 – 8.2
Transparency	**16.00**	**16.00**	**17.00**	**17.00**	**16.00**	**15.00**	Indiana Avg. 36 NTUs
Mg/l = milligrams per liter, cfu = colony forming unit, NTU = Nephelometer Turbidity Units							

Indicates above State Target

E. coli and orthophosphates appear to be chronically above State targets throughout the watershed. Additionally, Blackhawk Creek appears to habitually exceed limits in nitrates as well.

4. IDENTIFYING PROBLEMS, CAUSES, AND STRESSORS:

Using the data discussed in the previous section and summarized from Appendix H and Table 3-2, certain troublesome patterns developed either on a seasonal or chronic basis.

Sheet and gully erosion and excavation activities affect water transparency, which deteriorates during high water flows due to suspended solids. Riparian destruction obviously contributes to the fluctuation of suspended solids. Due to the abrupt topography of the project area, high water flows are of generally sharp, but short duration. Therefore, high sediment loads periods are brief and are hard to capture. Never the less, as Appendix J shows, some 8,572 tons of soil are calculated to wash down the streams of the project area each year.

Approximately 50 tons of nitrogen and 10 tons of orthophosphates from poor nutrient management practices are a major contributor to water degradation. Run-off from yards, streets, and parking lots adds pollutants such as pet waste, automobile lubricants, fertilizers, pesticides, and other agents. It was beyond the scope of this project to test for hydrocarbons etc., but normally accepted guidelines should be applied where appropriate.

In 1990, the state of Indiana adopted 410 IAC 6-8.1 which governs ***Residential Sewage Disposal Systems***. However, local administration of septic systems differs significantly from county to county around the state. Dubois County started permitting septic system in 1978, with Perry County doing so about the same time. Spencer County started aggressively enforcing regulations in 1990 and has helped small rural communities comply with regulations. Other than Saint Meinrad, there are no sewer districts in the project area, so older homes may not have a properly operating system. Generally, these problems are only addressed by county health departments when a complaint is submitted. New home construction in the three-county area is permitted only with an approved septic system permit.

The combined effects of erosion, chemical contaminants, and animal waste all take a heavy toll on the water quality of the project area is shown in Table 3-2.

5. IDENTIFYING SOURCES:

Appendix B shows both regulated and unregulated animal feeding operations and oil and gas wells; any one of which may be the source of impairments that affect the project area. Appendix G shows areas where much of the impairments originate, and critical areas in the project area. Other sections of this plan will continually make reference to these locations.

Riparian zones are inconsistent throughout the project area. In many places riparian zones are adequate with buffer strips present and maintained to mitigate nutrients. On the other hand, some owners are denuding the banks and conducting operations right up to the edge, and livestock is sometimes allowed to enter into the stream beds themselves.

Those streams most heavily impaired are graphically shown in Appendix G and summarized in Table 3. Determinations were made by using the ***Anderson River & Middle Anderson River Watersheds Resource Inventory & Priorities Plan***, visual observations, and in-situ data collection at the sites described in Table 1. Additionally, Table 3-2 lists the current loads and target loads in the project area.

Table 5-1, in conjunction with Appendix G shows those tributaries where impairments are degrading the main stream. Appendix J shows what can be achieved by focusing corrective measures to address those threats.

Table 5-1

Impairment Source Matrix

Site	Location	Animals in Streams	Construction in Floodway	Excessive Erosion	Riparian Zones	Vehicles in streams
A	Hurricane Creek Headwaters	√	√	√	√	√
B	Tributary to Ferdinand Lake	√			√	
C	Hurricane Creek Middle Portion		√	√		
D	Ferdinand Run - Friday Branch	√				
E	Ferdinand Run - Upper Portion	√		√	√	
F	Hurricane Creek - Lower Portion	√			√	
G	Blackhawk Creek – Entire Reach	√	√	√	√	√

6. IDENTIFYING CRITICAL AREAS:

A graphic picture of areas where significant improvements can be made in reducing water quality impairments by applying reasonable measures is graphically shown in Appendix G. Even though the sources are more numerous than critical areas, the critical areas were selected based on the ability to apply corrective measures, which are listed in Appendix J.

Table 3-2 shows the benchmark loads established during this project. Much of these loads are a direct result of the activities listed in Table 5-1.

The Spreadsheet Tool for the Estimation of Pollutant Loads (STEPL) from the U.S. Environmental Protection Agency used the benchmark data to calculate parameters and help identify critical areas. Data analysis was conducted with the help of Nathan Rice of the Indiana Department of Environmental Management.

By concentrating efforts on all of the critical areas simultaneously, maximum effect can be achieved with limited resources, rather than with a piece-meal approach.

Never the less, there are simple steps that can be undertaken that will begin to show immediate results. Limiting animal and vehicle access to streams and exercising responsible excavation techniques will reduce erosion, which will immediately begin to reduce sediment loads. Likewise, E. coli levels should drop as manure concentrations are reduced.

Advanced tillage methods can be employed, but will require a paradigm shift with a financial investment by land owners.

All of the elements listed in Table 5-1 should be addressed in the critical areas with the more comprehensive measures listed in Appendix J that are more complicated and more expensive. Appendix J shows empirically what projects should be initiated and what the results will be.

7. SETTING GOALS AND SELECTING INDICATORS:

Team members arrived at four goals for this project.
Goal 1: Reduce E. coli concentrations to the State of Indiana target for E. coli of 235cfu/100ml single sample or 125 cfu/100ml geometric mean over 5days.
Reduce Nitrogen concentrations to the State of Indiana target of 1 mg/l
Reduce Phosphorous concentrations to the State of Indiana target of .3 mg/l

Goa l 2: Reduction of Total Suspended Solids to State target of 30 mg/l

Goal 3: To significantly control the effects of flooding by retaining as much run-off as possible to reduce amounts reaching the main channels and tributaries during rainfall events as well as remove channel obstructions (i.e. log jams) to increase channel flow during floods.

Goal 4: To reduce the threats associated with vehicle use such as hydrocarbons, oil, antifreeze, road salts and deicers.

While goals are and 2 are empirical with quantatative data objectives, 3 and 4 are intuitive goals. Even though some goals are intuitive, they should be included to help achieve water quality standards by means other than the empirical ones.

The goals were constructed by reviewing the data collected and arriving at a consensus as to what was realistically achievable in terms of finances, manpower, physical assets, and time. They were fashioned by committee members familiar with the economic, physical, political, and social make-up of the project area.

Using Tables 3-2 and 5-1, which lists the average sample data, State targets, and impairment sources, those activities both intuitive and quantifiable that were determined to be feasible in the time frames indicated are listed in Appendix J.

Committee members labored over all of the data assembled and then used the STEPL to design a program of measures to achieve the goals listed earlier.

Appendix J lists the goals, measures, and time periods to achieve the goals. The STEPL was used to assist committee members in making decisions for prioritizing by using the Best Management Practices (BMP) tool as well as the water quality data. Appendix K shows the Input, BMP, and Total Load parts of the STEPL.

Only realistic BMPs, time frames, and reasonable expectations were utilized in developing a plan to meet water quality standards. By installing filter strips, Water and Sediment Control Basins (WaSCoBs), and riparian zones sediment can be drastically reduced. Likewise, by using these structures, dwell time will increase, and thereby reduce E. coli, nitrates, and phosphate levels. However, the best means to reduce impairments is to prevent them from entering the water to begin with by designing nutrient management programs, and ensuring septic systems are properly installed and working.

Implementing the measures in Appendix J within the time frame should help to bring impairments within target levels.

The alternative to not implementing the measures in Appendix J will be for the environment to continue to suffer, and for health and property hazards to increase.

8. Choosing Measures to Apply:

Appendix J lists the goals, measures, and time periods to achieve the goals in tabular form, while Appendix G shows the locations in a graphic form. The STEPL was used to assist committee members in making decisions for prioritizing by using the Best Management Practices (BMP) tool as well as the water quality data. Only realistic BMPs , time frames, and reasonable expectations were utilized in developing this plan.

Implementing the measures in Appendix J within the time frame should help to dramatically alleviate most of the original concerns identified by the members and help to bring impairments within target levels. The alternative to not implementing the measures in Appendix J will be for the environment to continue to suffer, and for health and property hazards to increase.

9. CALCULATING LOAD REDUCTIONS:

Appendix J utilizes the water quality data collected over the period of the project, combined with other parameters to determine base loads, targets, and methods to achieve the goals.

Likewise, data from sources such as the Natural Resources Conservation Service were used to calculate erosivity factors, loads, average soil loss, and cover-management factors.
Measures such as log jam removal and installing septic systems may require permits and easements. On January 20, 2007 the project hosted a workshop that discussed flood plains, wetlands, and excavation in and around them as part of the program to educate citizens about erosion and its contribution to poor water quality. It is important that permitting guidelines be followed in order to prevent exacerbation of erosion, sedimentation, etc.

Using the STEPL's BMPs tool (See Appendix K), various scenarios were evaluated by committee members to design load reduction goals. The reduction percentages arrived at were agreed upon by committee members with regard as to what was realistically achievable based on the experience of members familiar with the many facets of the project area. While filter strips, WaSCoBs, and riparian projects address agricultural situations, the earlier comments about logging being an important commercial element of the economy means that disturbed hill sides are susceptible to erosion as well. Therefore BMPs to address this situation are addressed as well.

By implementing the BMPs equally, and simultaneously, throughout the critical areas, the targets can be met in an expeditious manner. The Total Loads portion of the STEPL shows the current loads and the projected loads with and without BMPs.

10. IMPLEMENTING THE MEASURES:

A coalition of the Dubois, Perry, and Spencer County SWCDs must form a Steering Committee that is well suited to implement this Plan. Successfully implementing this plan will require enormous effort on the part of the Watershed Coalition, and all parties concerned.

A Section 319 grant will enable for the hiring of a full-time Watershed Coordinator, who will be directly responsible for implementing the various aspects of the plan.

The threats to the watershed such as erosion, nutrients, and E. coli can be addressed in a coordinated manner rather than in competitive, disjointed, and non-productive activities.

Whereas measures such as log jam removal and installing septic systems will require permits and easements, it is important that permitting guidelines be followed in order to prevent exacerbation of erosion, sedimentation, etc.

A cost share program should be developed to assist those landowners that wish to undertake the programs discussed in this plan, while offsetting the costs of implementation.

Outreach events will allow landowners, and other citizens, to benefit from one-on-one interaction and receive immediate feed-back from personal contact. Developing an education plan will allow for disseminating information to the citizens in the area regarding water quality issues. Public presentations, media blitzes, and displays at various activities will all contribute to keeping citizens informed.

Developing a water quality monitoring program will provide for comprehensive far-reaching decision making regarding programs, activities, and time lines.

The Action Register in Appendix J shows the various measures, timelines, and responsible parties needed to achieve the goals of the Steering Committee.

11. MONITORING INDICATORS:

A water quality monitoring plan should be devised and implemented when this plan is implemented, which will determine the success of the activities undertaken.

A schedule for collecting water quality data should be established that will reflect seasonal changes as well as climatic events.

The Watershed Coordinator will maintain the database, conduct analyses, and make periodic reports to the Steering Committee.

Animal Feeding Operations will need to be monitored on an ongoing basis to gage the effect of the education, enforcement, and outreach programs.

From time-to-time, the various threat inventories will need to be reviewed and up-dated. Then, adjustments may need to be made to the schedule and the approach to achieving the goals of the Watershed Group.

12. EVALUATING AND ADAPTING THE PLAN:

The A coalition from the Dubois, Perry, and Spencer County SWCD need to form a Steering Committee, which will be ultimately responsible for ensuring the success of this Watershed Management Plan.

The Committee will periodically evaluate the reports from the Watershed Coordinator and volunteers and make changes as necessary to address those areas in the watershed where additional efforts may be required.

REFERENCES:

Eck, Kenneth. March 7, 2000. Introductory Soil Loss Data For The Anderson River Watershed in Crawford, Dubois, Perry & Spencer Counties, Indiana for The Anderson River Watershed Steering Committee. Purdue Agronomy Department

Anderson River & Middle Anderson River Watersheds Resource Inventory & Priorities Plan. Bernardin-Lochmuller & Associates, Inc. December 17, 2002

Metadata: Refer to Appendices L and M for the metadata applicable to the data developed as part of this plan.

Volunteer Stream Monitoring Training Manual, Indiana Department of Natural Resources. March, 2005

Load Reductions and Concerns and Goals Matrix

Goal 1. Reduce E. coli concentrations to the State of Indiana target for E. coli of 235cfu/100ml single sample or 125 cfu/100ml geometric mean over 5days.
Reduce Nitrogen concentrations to the State of Indiana target of 1 mg/l
Reduce Phosphorous concentrations to the State of Indiana target of .3 mg/l

Load Type	**Amount**
Current Load	Varies by sub-watershed
Target Load	235cfu/100ml single sample or 125 cfu/100ml geometric mean over 5days Nitrogen: 1 mg/l Phosphorous: .3 mg/l
Reduction Needed	Varies by sub-watershed

Objective/ Management Measure	**Load Reduction**	**# needed to reach target load**	**Action Item**	**Cost**	**Schedule**	**Indicators**	**Responsible Party (RP) and Technical Help (TH)**
Hire a Watershed Coordinator	N/A	N/A	Find a qualified individual	$120,000 – over 3 years	First months of project	Coordinator is hired	RP = Watershed Group TH = IDEM (Section 319 with match) SWCDS
Develop Water Quality Monitoring Program	N/A	N/A	Develop a QAPP	Cost built into Section 319 and cost share	First months of project	QAPP is approved by IDEM	RP = Watershed Group TH = SWCDS, IDEM
			Implement water sampling program Agreement/contract with certified lab.	Cost built into Section 319 and cost share	6 Sites monthly during the project and beyond	Water quality database is developed	RP = WG TH = SWCDS, IDEM, IDNR
Encourage Development of county-wide Waste Water Treatment Networks	N/A	N/A	Encourage elected officials to pursue funding to address waste water facilities	Cost built into Section 319 and cost share	Duration of Grant 1-3 years	Number of waste water systems installed/ enlarged	RP = WG TH = SWCDS, IDEM, IDNR, County Health Officers, State Health Dept.
Educate Homeowners Regarding Properly Operating Septic Systems	N/A	N/A	Distribute articles to newspapers, radio and TV spots, displays at fairs, etc	$600.00	Duration of Grant 1-3 years; then ongoing indefinitely	Number of septic systems permitted, improved, inspected Number of people receiving information	RP = WG TH = SWCDS, IDEM, IDNR, County Health Officers, State Health Dept.
Exclude Livestock From Streams	Not Estimable	Part of cumulative effects of reduction measures	Educate livestock owners regarding water quality issues	Cost built into Section 319 and cost share	Duration of Grant; ongoing indefinitely	Number of livestock exclusions, alternative watering systems installed	RP= WG TH = IDEM, SWCDS, NRCS
Eliminate Animal Carcasses Thrown Into Streams	Not Estimable	Part of cumulative effects of reduction measures	Educate Citizens Regarding Water quality issues via news media	$500.00	Duration of Grant; ongoing indefinitely	Reduction in animal carcasses found in streams	RP = WG TH = SWCDS, IDEM, IDNR, County Health Officers, State Health Dept., VOLUNTEERS

Load Reductions and Concerns and Goals Matrix

Reduce Runoff from Livestock Areas and Lawns	Not Estimable	Part of cumulative effects of reduction measures	Promote nutrient management programs Educate citizens regarding nutrient management plans, waste storage/ disposal, buffers	$200.00	Duration of Grant; ongoing indefinitely	Number of people receiving information	RP = WG TH = SWCDS, IDEM, IDNR, County Health Officers, State Health Dept., VOLUNTEERS
Reduce Nitrogen concentrations to the State of Indiana target Reduce Phosphorous concentrations to the State of Indiana target	Current Load = 49.2 tons/yr Current Load = 9.6 tons/ yr	Target Load = 43 tons/ yr 13% Reduction Target Load = 7.59 tons/yr 21% Reduction	Install Filter Strips in Critical Areas per Appendix G and Table 3-2 Blackhawk Creek = 10 Acres Ferdinand Run & Hurricane Creek Vicinity of Site #4 = 2 Acres Hurricane Creek – Upstream of Site #6 = 2 Acres Tributary to Ferdinand Lake = 1 Acre Total 15 Acres	$2,400.00	Annually: March – October; continuous and beyond	Number of filter strips installed Reduction in nitrogen and phosphorous levels	RP = WG TH = SWCDS, IDEM, IDNR, NRCS, Volunteers

Goal 2 : Reduction of Total Suspended Solids to State target of 30 mg/l.

Load Type	Amount
Current Load	Varies by sub-watershed
Target Load	30 mg/l
Reduction Needed	Varies by sub-watershed

` Objective/ Management Measure	Load Reduction	# needed to reach target load	Action Item	Cost	Schedule	Indicators	Responsible Party (RP) and Technical Help (TH)
Hire a Watershed Coordinator	N/A	N/A	Find a qualified individual	Cost built into Section 319 and cost share	First months of project	Coordinator is hired	RP = SWCDS TH = IDEM (Section 319 with match)
Develop Water Quality Monitoring Program	N/A	N/A	Develop a QAPP	Cost built into Section 319 and cost share	First months of project	QAPP is approved by IDEM	RP = WG TH = SWCDS, IDEM
			Implement water sampling program	Cost built into Section 319 and cost share	6 Sites monthly throughout the project and beyond	Water quality database is developed	RP = WG TH = SWCDS, IDEM, IDNR
Develop Public Outreach/ Education Program	N/A	N/A	Publish informational articles in newsletters, discuss at SWCD meetings, release public media articles Display at fairs, etc	$600.00	Duration of Grant	Articles published, programs presented, displays Number of people receiving information	RP = WG TH = SWCDS, IDNR, NRCS
			Create displays for events like county fairs	$500.00	Annually - Duration of Grant	Displays created, number of people addressed	RP = WG TH = SWCDS, IDNR, NRCS
			Establish a website	$500.00	First months of project	Website established	RP = WG
Slope/Vegetate Roadside Ditches	Dependent on slope and depth	Part of cumulative effects of reduction measures	Encourage county/state highway crews to change profile of ditches over five year period to 1½ to 1 slope	Cost built into Section 319 and cost share Plus highway department budgets	Annual road maintenance program	Miles of ditches with improved profiles	RP = WG, County/state highway crews TH = State/county highway depts.

Load Reductions and Concerns and Goals Matrix

Implement Reduced Tillage Practices	Dependent on slope and types of soils	Part of cumulative effects of reduction measures	Promote cost share Convert to reduced-till as needed or until target levels are met	App $25 Ac Fed Gov – up to 90% cost share up to 2,500 Ac	Second month- continuous effort to convince owners to change to reduced till	Number of acres converted to lower till methods	RP = WG TH = SWCDS, IDNR, NRCS
Restore/Maintain Wetlands	Not estimable	Part of cumulative effects of reduction measures	Promote construction/ restoration of wetlands	$2,000/ $3,000 Ac For wetlands	Annually- indefinitely	Wetlands constructed	RP = WG TH = NRCS, IDNR, Ducks Unlimited, Waterfowl USA
			Promote Wetland Reserve Program	Cost built into Section 319 and cost share	Annually – through September- indefinitely	Number of landowners receiving assistance Amount of acres enrolled	RP = WG TH = NRCS, SWCDS, IDNR
Provide Assistance to Private Landowners with Timber	N/A	N/A	Encourage enrollment in the Indiana Classified Forest and Wildlands Program	Cost built into Section 319 and cost share	Duration of project, then ongoing indefinitely	Number of landowners enrolled, number of landowners receiving information	RP = WG TH = SWCDS, IDNR - Forestry
			Provide advice on tree planting	$75.00	Duration of project, then ongoing indefinitely	Number of landowners receiving assistance	RP = WG TH = SWCDS, IDNR - Forestry
			Distribute a Directory of Professional Foresters	$150.00	Annually	Directory is published, number of landowners receiving information	RP = WG TH = SWCDS, IDNR - Forestry
			Distribute "A Forest Landowners Guide to Internet Resources"	$75.00	Duration of project, then ongoing indefinitely	Guide is published, number of landowners receiving information	RP = WG TH = SWCDS, IDNR - Forestry
Reduce Erosion From Construction Sites	Not Estimable	Part of cumulative effects of reduction measures	Distribute information on Rule 5	$75.00	Duration of project, then ongoing indefinitely	Reduction in number of Rule 5 violations	RP= WG TH = IDEM
Exclude Livestock From Streams	Not Estimable	Part of cumulative effects of reduction measures	Educate livestock owners regarding water quality issues	$550.00 and cost share	Duration of project, then ongoing indefinitely	Number of livestock is reduced, alternative watering systems installed, exclusion fences erected	RP= WG TH = IDEM, SWCDS, NRCS
Apply Stream Bank Stabilization in Critical Areas per Appendix G and Table 3-2	Varies by Sub-watershed	Total 15 Acres	Blackhawk Creek = 10 Acres Ferdinand Run & Hurricane Creek Vicinity of Site #4 = 2 Acres Hurricane Creek – Upstream of Site 6 = 2 Acres Tributary to Ferdinand Lake = 1 Acre	$26,136.00	Annually: March – October; Continuous until goal is met	Number of acres developed	RP= WG TH = IDEM, SWCDS, NRCS

Goal 3. To significantly control the effects of flooding by retaining as much run-off as possible to reduce amounts reaching the main channels and tributaries during rainfall events as well as remove channel obstructions (i.e. log jams) to increase channel flow during floods.

Load Type	**Amount**
Current Load	Varies by sub-watershed
Target Load	This is a non empirical intuitive goal
Reduction Needed	Varies by sub-watershed

Objective/ Management Measure	**Load Reduction**	**# needed to reach target**	**Action Item**	**Cost**	**Schedule**	**Indicators**	**Responsible Party (RP) and Technical Help (TH)**
Develop Public Outreach/ Education Program	N/A	N/A	Publish informational articles in newsletters, discuss at SWCD meetings, release public media articles Display at fairs, etc	Cost built into Section 319 and cost share	Duration of Grant	Articles published, programs presented, displays Number of people receiving information	RP = WG TH = SWCDS, IDNR, NRCS
			Create displays for events like county fair, Support Envirothon	Cost built into Section 319 and cost share	Annually - Duration of Grant, ongoing	Displays created, number of people addressed	RP = WG TH = SWCDS, IDNR, NRCS
			Establish a website	Cost built into Section 319 and cost share	First months of project	Website established	RP = WG

Reduce flooding due to lack of run-off retention during periods of high rainfall as well as numerous channel and tributary obstructions such as stumps, logs, and other debris.	Varies by Sub-watershed	Blackhawk Creek = 3,000' Ferdinand Run & Hurricane Creek Vicinity of Site #4 = 2,000 Feet Hurricane Creek – Vicinity of Site 6 = 500 Feet Tributary to Ferdinand Lake = 500 Feet	Apply Diversion in Critical Areas per Appendix G and Table 3-2	$16,335.00	Annually: March – October; Continuous until goal is met	Number of units installed	RP = WG TH = SWCDSS, IDNR, NRCS
		Blackhawk Creek = 3 Each Ferdinand Run & Hurricane Creek Vicinity of Site #4 = 2 Each Tributary to Ferdinand Lake = 1 Each	Construct Water and Sediment Control Basins in Critical Areas per Appendix G and Table 3-2	Total: 6 Each = $10,500.00	Annually: March – October; Continuous until goal is met	Number of units installed	RP = WG TH = SWCDS, IDNR, NRCS
		Upstream of Site # 6 = 5 Acres	Conduct Forest Dry Seeding in Critical Areas per Appendix G and Table 3-2	Total: $2,440.00	Annually: March – October; Continuous until goal is met	Number of units installed	RP = Hoosier National Forest & Ferdinand State Forest TH = SWCDS, IDNR, NRCS

Goal 4: To reduce the threats associated with vehicle use such as hydrocarbons, oil, antifreeze, road salts and deicers.

Load Type	Amount
Current Load	Varies by sub-watershed
Target Load	This is a non empirical intuitive goal
Reduction Needed	Varies by sub-watershed

Objective/ Management Measure	Load Reduction	# needed to reach target load	Action Item	`Cost	Schedule	Indicators	Responsible Party (RP) and Technical Help (TH)
Address concerns associated with vehicle use, traffic and parking such as hydrocarbons, oil, antifreeze, road salts and deicers.	Not Estimable	Not Estimable	Educate public about negative effects of hydrocarbons, oils, antifreeze, etc. in waterways, as well as proper disposal of such items; and promote the establishment of buffer areas between sources of vehicular run-off (i.e. large parking lots) and bodies of water; check for alternative salt or deicers through the County Highway Departments.	Cost built into Section 319 and cost share	Quarterly/ continuous	Reduction of oil spills/ litter, number of buffer strips,	RP = WG, INDOT, COUNTIES TH = SWCDS, IDEM, IDHS, IDNR, INDOT, COUNTIES
			Industrial Transportation Spills Along Interstate 64: (Little can be done in advance of a potential spill except prepare local and state response agencies.)	Cost built into Section 319 and cost share	First months of grant – annual follow-up	Number of Emergency Action Plans that include response actions	RP = WG, INDOT, COUNTIES TH = SWCDS, IDEM, IDHS, IDNR, INDOT, COUNTIES
			Encourage the establishment and promotion of roadside clean-up events; Adopt-A-River and Adopt-A-Highway programs; and Tox-A-Way Days in involved counties.	Cost built into Section 319 and cost share	Adopt-A-Highway twice annually Adopt-A-River once yearly - continuous	Number of clean-up events, amount of toxic materials disposed of	RP = WG, INDOT, COUNTIES TH = SWCDS, IDEM, IDHS, IDNR, INDOT, COUNTIES, VOLUNTEERS