

Introduction

This watershed management plan addresses local water quality conditions identified in three 14-digit Hydrologic Unit Code (HUC) subwatersheds located within the Upper White River Watershed in Delaware County. This plan was created by the members of the White River Watershed Project (WRWP), a project overseen by the Delaware County Soil and Water Conservation District.

The White River Watershed Project is a community-driven, voluntary effort to clean-up and reduce non-point source water pollution for a better quality of life in Delaware County. This management plan shall serve as a guide for local citizens from all sectors of the community to accomplish that stated goal. This plan identifies local water quality issues and concerns, provides step-by-step methods for addressing each one, and steers the reader towards sources that can help them implement the listed suggestions.

The WRWP had maintained an assertive public outreach program from its onset: with the goal to inform and involve as much of the public as possible in the planning process. Through the high level of community involvement that was achieved, wide spread support for the implementation phase of this project has been gained. Orchestrating such involvement was not without its challenges, as anyone who has tried to bring people together from widely differing backgrounds can attest to. However, it was these very challenges that provided the foundation for this strong, well thought out, and highly supported watershed management plan.

All of the work conducted by the White River Watershed Project Committees, the Soil and Water Conservation District Board and the general public has been brought together to create this plan. This is a document that has truly been developed by and for the people of Delaware County, Indiana.

Executive Summary

This White River Watershed Project (WRWP) Watershed Management Plan covers three 14-digit HUC subwatersheds within the Upper White River Watershed within Delaware County, Indiana. The WRWP is a community-driven, voluntary project to clean-up and prevent non-point source water pollution through the development and implementation of this management plan. The EPA, Section 319 Clean Water Act 3-year (2001–2004) grant which funded this project was held by the Delaware County Soil and Water Conservation District, who provided a Watershed Coordinator to manage the project.

The three specific subwatersheds studied as a part of this project are the Killbuck/Mud Creek, Buck Creek and Prairie Creek Subwatersheds. Each subwatershed is roughly between 10,000 and 17,000 acres in size and has a mixture of agricultural (primarily), suburban and urban land use. Both historic and new baseline information were gathered on all three subwatersheds to obtain the clearest understanding of current water quality and land use conditions. Analysis of the historic and newly gathered baseline information on water quality, habitat, land cover and land use revealed non-point source water pollution problems and positive conditions throughout each subwatershed. Correlations between land cover type and width along the stream corridors and specific water pollution conditions were discovered through regression analysis.

Killbuck/Mud Creek Subwatershed was found to have problems with total suspended solids, ammonia, nitrogen, orthophosphates, *E. coli*, dissolved oxygen, stream biology and habitat. Most of the wooded vegetation along both Killbuck and Mud Creeks has been removed and the channels have been dredged to the point that they are not stable over the long term. The main positive finding in this subwatershed is that the majority of the failed/failing septic systems that plague this subwatershed will be connected to a sewer system by the end of 2004. This should greatly reduce not only the *E. coli* levels, but some of the nutrient and total suspended solids, which should in turn improve the stream biology. However, without some actions taken to stabilize and restore vegetation along the banks of the stream channels, only limited improvements can be expected.

Buck Creek Subwatershed has issues with total suspended solids, ammonia, orthophosphates, nitrates and *E. coli*. One notable positive finding with the Buck Creek Subwatershed is that its stream temperature regime classifies it as a coolwater stream throughout its reaches, and a coldwater stream at its headwaters. This is possible through a combination of the stream being spring fed near its headwaters and the fact that a good portion of its banks are still covered by woody vegetation. The potential for Buck Creek to become an official coldwater stream is possible with some protective and remedial action.

Prairie Creek Subwatershed is a rather unique subwatershed as it possesses a man-made drinking water reservoir as its major waterbody. This reservoir was created by damming the major creek in the subwatershed (which is also fed by three other smaller tributaries). From the results of the baseline study, it was determined that ammonia, orthophosphates, nitrates, *E. coli*, and in some instances dissolved oxygen and stream biology and habitat were problematic in this subwatershed. The major positive finding for this subwatershed was the extensive wooded and grassed buffer acreage that surrounds the reservoir and one of the tributaries that feed into it (Huffman Creek).

The status of this buffer is in jeopardy due to the fact that this acreage is under the ownership of a private water company and the lease held by the local park department (which protects the acreage) is due to expire in 2013. This is compounded by the fact that there is no master plan for the reservoir or the surrounding subwatershed.

Parameter	Total Reduction (lbs/year)/ <i>E. coli</i> (cfu/year)
K/M ammonia	3851.07
K/M <i>E. coli</i>	6.32307E+15
K/M nitrate	5846.29
K/M orthophosphate	776.55
K/M TSS	1013520.84
BC ammonia	10646.23
BC <i>E. coli</i>	6.375E+16
BC nitrate	17554.47
BC orthophosphate	-3455.50
BC TSS	-2806091.24
PC ammonia	4620.71
PC <i>E. coli</i>	3.63745E+15
PC nitrate	-33810.11
PC orthophosphate	-2242.85
PC TSS	-1844244.09
Total ammonia	19118.02
Total <i>E. coli</i>	7.37105E+16
Total nitrate	-10409.35
Total orthophosphate	-4921.80
Total TSS	-3636814.49

Target load reductions were calculated by sub-subwatershed, subwatershed and for the total three subwatersheds.

This table represents the targeted total load reduction by subwatershed and for the total of all three subwatersheds. Numbers in red indicate that current estimated loads are less than the target load reduction for that specific parameter.

The suggested implementation actions (for the next 3-5 years) are as follows:

Killbuck/Mud Creek Subwatershed

- Increase Filter Strips/Riparian Buffers Along Primary and Secondary Waterways
- Increase Conservation Tillage/Residue Management
- Install a Tile Control Structure Demonstration Site
- Reengineer Both Stream Channels
- Install a Constructed Wetland Storm Water Treatment Demonstration Site
- Repair/Remove Failed/Failing Septic Systems and Treatment Facilities

Buck Creek Subwatershed

- Restore and Protect Riparian Corridor along Buck Creek and Determine Ability to Support Salmonid Species
- Promote Manure/Nutrient Management
- Increase Conservation Tillage/Residue Management
- Remove rock dam upstream of BC-6 sampling point (CR 400 South)
- Install a Tile Control Structure Demonstration Site
- Remove/Repair Failed/Failing Septic Systems

Prairie Creek Subwatershed

- Develop a Master Plan for the Prairie Creek Watershed
- Promote Manure/Nutrient Management
- Increase Conservation Tillage/Residue Management
- Install a Constructed Wetland Demonstration Site
- Install a Tile Control Structure Demonstration Site
- Remove/Repair Failed/Failing Septic Systems

Actions Applicable to All Three

- Public Education
 - Identify and Promote Drainage Management Options
 - Promote Septic System Maintenance
 - Promote Erosion Control
 - Promote Lawn/Turf Management
 - Conduct Education on Organic/Chemical Free Agriculture/Gardening
 - Conduct Public Watershed Education and Outreach
- Provide an Agricultural Technical Assistant
- Conduct a Modified Monitoring Program
 - E. coli source identification
 - Lake study on Prairie Creek Reservoir
 - Modified bacteriological, biological and chemical monitoring of the three subwatersheds
- Update GIS Data Layers

Through these actions, there is an estimated load reduction for several pollution parameters over the collective area of all three studied subwatersheds (as calculated using the EPA Region 5 load reduction worksheet). They are as follows:

Total Suspended Solids: 15869 lbs/year

Sediment: 3706.6 tons/year

Nitrogen: 15933.1 lbs/year

Phosphorus: 5316.3 lbs/year

These actions, once implemented, shall be monitored for success using various methods; including water and land use/cover monitoring, pollutant load reduction calculations, participant reviews and numbers, and monitoring acreage increases in target practices.

The responsibility for measuring the success of the implementation of this management plan shall be with the Delaware County Soil and Water Conservation District. Funds for the implementation phase shall come from a second EPA Section 319 grant, again to be held by the District, in the amount of \$400,000.00. The District shall build upon the strong community support garnered during the planning phase of the White River Watershed Project to ensure a successful implementation phase.

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