LITTLE MAHONING CREEK watershed

MANAGEMENT PLAN

Process and Criteria for Determining Threats to Watershed Resources
for the Little Mahoning Creek Watershed Association

Indiana County, Pennsylvania

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Watershed Group Evaluation

Background

The Little Mahoning Creek Watershed Association (LMCWA) is a young organization made up of individuals interested in protecting the high-quality nature of the watershed (Fig.1). The group formed in 2001 largely by the influence of the urging of the Indiana County Watershed Specialist, but it was not a true grassroots formation. This led to the original group nearly going defunct. In 2006, WPC began the Saving Little Mahoning Creek initiative, which is aimed at protecting this relatively healthy and biologically diverse watershed. This effort reinvigorated the watershed group, and many new people began to take an interest. Rebuilding the group was a natural grassroots progression, and the organization is healthy and growing. Unlike many watershed groups, the LMCWA is largely made up of individuals less than 40 years old.

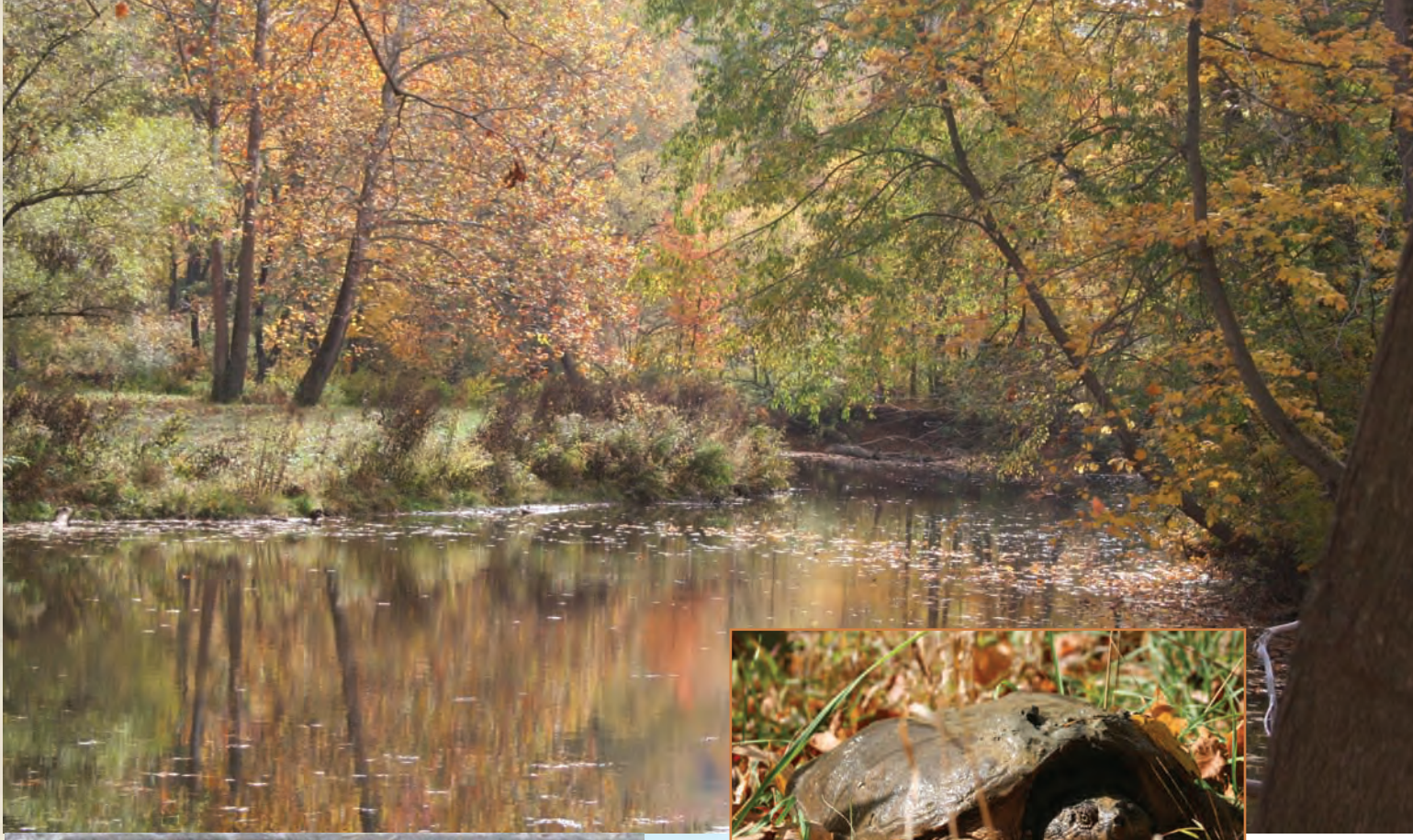
LMCWA worked closely with WPC to complete a comprehensive watershed assessment, and by being part of that process, they learned what the critical needs are. The largest impact is excess sediment due to accelerated erosion, poorly maintained dirt and gravel roads (Fig. 2), poor agricultural practices, and impacts from natural gas exploration. In addition to dealing with the erosion and sediment impacts, the group conducted two major cleanups of illegal dump sites, and conducted a public meeting on May 19, 2010, which was attended by 72 individuals. The group leadership conducted presentations, which helped get their efforts noticed by watershed citizens and stakeholders.

Like most groups we work with, LMCWA initially had broad and undefined goals. WPC has been able to help them understand what the most critical aspects of protecting the watershed are so that they can narrow their focus. We will be working with the group to take the lead on important restoration projects, while gaining new members through localized outreach. This will also involve the completion of their final watershed management plan, which is being developed based upon the established evaluation criteria.

The LMCWA, in conjunction with many partners, has already found success with implementing physical projects in the watershed. These projects include:

- Construction of six floats for stocking trout in the spring as part of increasing outreach to local fishermen and women.
- Construction of six wood duck boxes for placement in early spring as part of increasing outreach to the watershed community.
- Removal of the five-foot high, over 100 feet long Savan Dam, which has been impeding fish passage in the upper watershed since 1938.
- Installation of numerous in-stream habitat and stream bank protection devices on two properties impacted by erosion and sediment concerns

In addition to these completed projects, the group applied for and received a grant to develop a canoe access point along the stream, which will further help them achieve their outreach goals.




DAVAN DAM NO. 3
CONSTRUCTED BY
W. P. A.
MARCH 29, 1938
-SPONSORS-
COMMISSIONERS OF
INDIANA COUNTY

Watershed Identification...

Aquatic Resource Values, Current Conditions and Threats

a. Compilation of Existing Data

i. High Quality and Exceptional Value Waterways (DEP)

1. Little Mahoning Creek watershed is considered a High Quality Cold Water Fishery (HQ-CWF). The definition of High Quality waters; Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

ii. Threatened and Endangered Species Information (Natural Heritage Inventory)

1. Little Mahoning Creek provides ideal habitat for a wealth of aquatic species because of high water quality and limited historical impacts on aquatic species. Among the rare taxa found within Little Mahoning Creek watershed the rainbow mussel and the round pigtoe are both state listed species (S2 and S1 respectively). These species have been greatly reduced in areas outside of the Little Mahoning Creek watershed due to mining, improper forestry activities, pollution, and development on the landscape. Today, only a handful of isolated sites within the Commonwealth have a similar number of listed aquatic species making this a key location for proactive steps to maintain its quality.

iii. Aquatic Community Classification (WPC)

1. Two significant communities are present for fish species in the Little Mahoning Creek watershed. Lower Little Mahoning – Ohio warmwater community (ex. greenside darter and northern hogsucker) Upper Little Mahoning - Ohio coolwater community (ex. blacknose dace and creek chub).

2. Mussels: There are ten species of freshwater mussels in the Little Mahoning Creek watershed. Several of those species are considered rare in Pennsylvania including the round pigtoe and the rainbow mussel. Other species found include the creeper, kidney shell, fluted shell, spike, fat mucket, wavy rayed lamp mussel, pocketbook, elktoe.

iv. Current Condition and Threats Within the Watershed

1. This entire system is threatened by various sources of water pollution. Because it is underlain by the Marcellus shale formation, deep natural gas extraction is a realistic possibility within this system (Fig.3). The input of any waste products resulting from Marcellus shale fracturing could cause significant long-term negative impacts on the aquatic life in the creek. Working closely with gas companies to help them understand the sensitivity of the watershed will be paramount. A major concern throughout the watershed are the miles of dirt and gravel roads that traverse it. Proper drainage and the continual maintenance of these roads will help Little Mahoning recover from the over abundancy of sedimentation runoff entering the streams from the poorly drained roads.

2. Other inputs from improper farming and forestry practices within the watershed could be just as damaging to the aquatic life in the creek. Excess nutrients and sediments can smother or bury aquatic life in the stream. Additional sediment inputs can alter stream bed habitat by decreasing the "grain size" of the bed load resulting in a silty to mucky river bottom.

3. Development within the floodplain will result in additional inputs of nutrients and sediment by removing the riparian buffer. This development will also reduce flood storage capacity for the stream by decreasing the size of the floodplain.

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v. 303(d) List of Impaired Waterways (DEP)

1. A total of 31.5 stream miles are affected by abandoned mine drainage (AMD) and are listed as AMD-Impaired (Fig.4). It should be noted, however, that actual AMD impairment is limited to a very small area in headwater streams, particularly Cessna Run. A treatment facility was constructed within this subwatershed and is functioning well, greatly reducing acidity entering the system.

vi. Potential Point-Source Pollution, Including AMD (DEP)

1. There are four main point pollution sites in the watershed (Fig.5). The main areas were on the east side of Route119. Coal mining operations were a moderate problem within the watershed. Many problems result from the middle and north western portions of the watershed from several facilities and operations such as the Industrial Mineral Mining Operation (Fig.8). The last source in the southeastern portion is a municipal waste treatment operation. In addition, there are more than 2,500 active shallow natural gas wells within the watershed, and the first Marcellus shale wells have been permitted.

vii. Landcover-Related Metrics (WPC)

1. The three major land use types that were analyzed at the sub-watershed level in Little Mahoning included forested areas (69%), Agricultural (30%), and developed areas (1%).

viii. Active River Area Analysis

1. WPC staff reviewed several portions of the Active River Analysis document that The Nature Conservancy (TNC) released in July 2010. Based on the small scale nature of this project (only one watershed) versus the multi-state geographic extent of the active river area analysis, we feel that this project doesn't benefit from a detailed analysis utilizing the program.

b. Major Threat Identification

i. Based on extensive GIS analysis that was completed for this project, there are a significant number of threats to this

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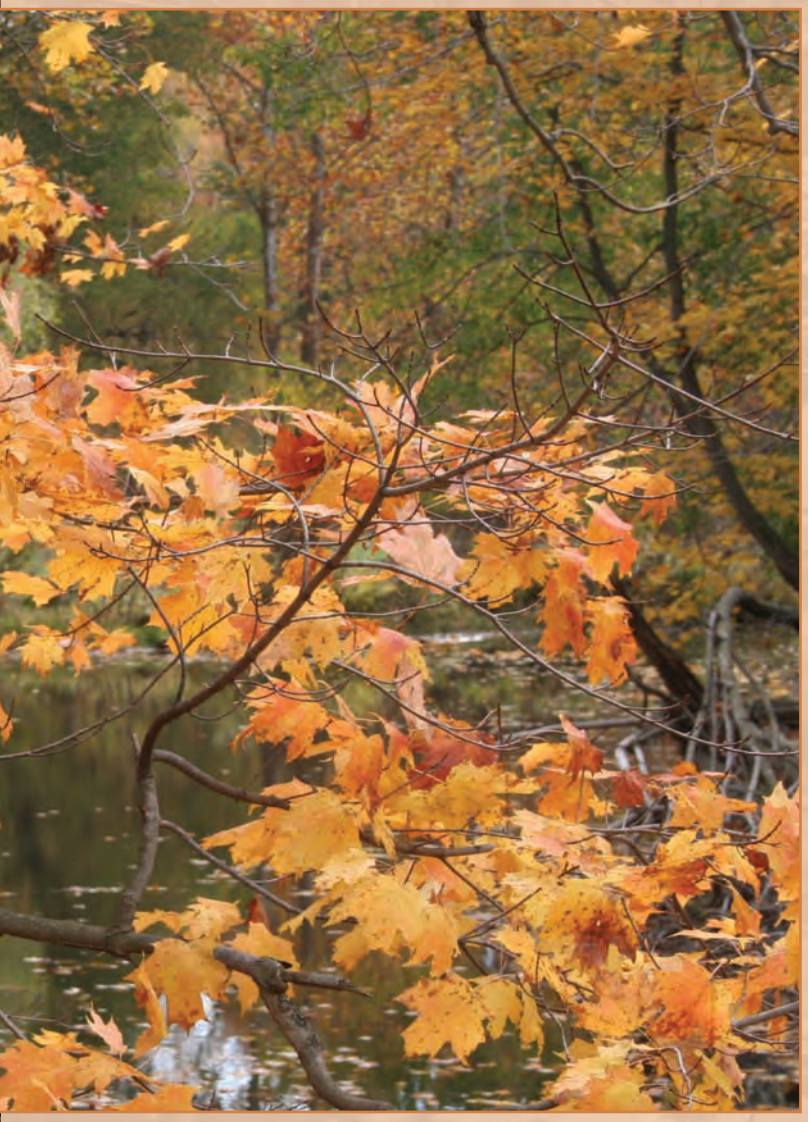
watershed. Addressing these problems will be the responsibility of a larger partnership led by LMCWA. WPC recommends that the group to focus on parcel-level projects including stream bank fencing, steam bank stabilization, fish habitat and agricultural projects because they yield results rather quickly for improving water quality, can be completed for reasonable amounts of money, and will address the most significant threat to the watershed. Using a comprehensive GIS developed for the watershed, the most critical areas have been identified and several landowners have been approached successfully.



c. Information From Completed Assessments or Conservation Plans

i. In an attempt to document the current condition of stream banks, riparian corridors, in stream habitat, dirt and gravel road impacts, and other associated threats to stream habitats, a detailed visual assessment was initiated by WPC in 2006 (Fig.6). To date, a total of 205.3 miles of streams have been visually assessed in the Little Mahoning Creek watershed (Fig.7). Results indicate certain sections of Little Mahoning Creek are in a state of disrepair, while other locations have pristine habitat conditions for aquatic and terrestrial species alike. A variety of impairments were discovered including dirt and gravel road issues, abandoned mine drainage, habitat modification, and erosion and sedimentation problems that can be related to poor agricultural practices. Most of the impairments were found in the middle and lower reaches of the watershed, which contains large amounts of farmland. The upper reaches of the watershed are dominated by a more than 5,000 acre State Game Lands, so agricultural impairments are minimal. Dirt and gravel roads pose a serious threat in this area. WPC has been actively working with a diverse partnership that includes state and federal agencies, landowners, schools, and several grassroots conservation organizations to remediate some of these threats to the Little Mahoning Creek watershed. So far, more than $1.5 million has been dedicated to the Saving Little Mahoning Creek initiative.

d. Data Analysis and Map Production

i. As a result of this project WPC has created several different maps to help LMCWA determine locations for future restoration projects. These maps have been provided to the watershed group for future use.

e. Identification of Data Gaps

i. The upper reaches of Little Mahoning Creek are the most pristine of the watershed. Since most of the headwaters area is State Game Land, the impact from agriculture is very minimal. The most impaired section of the watershed is the middle to lower reach as identified in the comprehensive assessment. This area consists mostly of agriculture and minimal vegetative riparian zones. LMCWA should focus on working with landowners to implement agricultural best management practices, such as stream bank fencing, barnyard stabilization, and stream bank stabilization. There is also some opportunity to work with large landowners not implementing agricultural practices to improve eroding stream banks and in-stream habitat.

Stakeholder Meeting

WPC, in conjunction with Little Mahoning Creek Watershed Association, held a public meeting on May 19, 2010, to discuss current and future projects being implemented throughout the watershed. More than 70 individuals attended to learn more about the Saving Little Mahoning Creek initiative, and offer suggestions for improvements to the stream.

Draft Watershed

Management Plan Developed

a. Threat Identification (Sources) and Ranking

i. Feasibility of success by group

The most significant impact to the watershed is excess sedimentation due to erosion. This sedimentation is due to poor agricultural practices, poorly drained dirt and gravel roads, riparian area modification, and increasing natural gas exploration. LMCWA can have significant success addressing these threats by working in partnership with the many groups that make up the Saving Little Mahoning Creek initiative. At this time, AMD is not a significant enough threat to warrant much attention.

ii. Overall impact on the watershed

There are several sections of Little Mahoning Creek that would benefit from implementation of best management practices designed to reduce sediment pollution. Within the next three to five years, LMCWA should focus on the lower two-thirds of the watershed. The targeted areas of implementation should be on streambank restoration, agricultural BMPs, and dirt and gravel road projects. Concentrating in these areas over time will strengthen the overall health and diversity of the stream. There are also areas that have been prioritized for land protection either through purchase or conservation easement. Although the lower two-thirds of the watershed are impacted by sediment pollution, the implementation of conservation practices in these areas will result in significant improvement to the entire system.

iii. Available funding

Funding is available from a wide variety of sources for stream restoration projects. By working with the Indiana County Conservation District and the USDA-NRCS staff, LMCWA can put projects on the ground utilizing a variety of funding that is available for local farmers, which include the Environmental Quality Incentive Program (EQIP) and Wildlife Habitat Incentive Program (WHIP). Additionally, the Conservation Reserve Enhancement Program (CREP) can be utilized to take marginal lands out of production while paying the farmer to do so. Additionally, there are numerous public and private funding sources available to support watershed restoration initiatives. Private sources include foundations, such as the Richard King Mellon Foundation, The Foundation of Pennsylvania Watersheds, Dominion Foundation, Colcom Foundation, and many others. Public sources include the Pennsylvania Growing Greener Program, and several federal sources from EPA and USDA.

iv. Available partners

Pennsylvania is home to an enormous number of non-profit conservation groups that cover a diverse range of interests. Some of these groups include Pheasants Forever, Ducks Unlimited, Trout Unlimited; and the Izaak Walton League of America. There are also numerous government partners that include county Conservation Districts, PFBC, PGC, and DEP at the state level, and EPA, OSM, USDA, and the U.S. Army Corps of Engineers at the federal level. In addition to these partners, other non-profit conservation groups including WPC, Ameri can Rivers, and The Nature Conservancy are often available to help with identifying and then direct implementation of conservation projects. Additional partners specific to the watershed are Indiana University of Pennsylvania, Marion Center High School, Penn State Center for Dirt and Gravel Roads Studies, and numerous energy companies.

v. Impact on regional conservation

Implementing restoration and protection strategies within the Little Mahoning Creek watershed will help a variety of species that are found within the stream and areas downstream to the Allegheny River. As LMCWA leads the effort on restoration

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and protection activities, they could act as a model for other small watershed groups to follow. Additionally, Little Mahoning Creek is most biologically intact stream feeding the Allegheny River in southwestern Pennsylvania. In order to continually improve water quality in the river, and ultimately the Ohio River drainage, maintenance of positive influences offered by streams like Little Mahoning Creek is critical and a wise investment of time and dollars.

b. Strategies to Address Threats

Threats have been identified through the comprehensive assessment and the use of GIS for further evaluation of field-collected data. LMCWA has helped with several stream bank protection and fish habitat projects, a dam removal, and two cleanups of illegal dumps. Building on that momentum the group should begin to focus on the western tributaries and the lower two-thirds of the watershed, which is the most impaired and in need of improvement. Strategies should continue to be focused on implementation of best management practices that reduce erosion from identified sources. Water quality monitoring should be implemented into their focus to help with identifying present or future problems that may exist throughout the watershed. Within the next year, LMCWA should consider assigning groups to collect data and monitor water quality on several sections of the stream before and after project completion and implementation and conservation practices.

c. Desired Outcomes

If the actions found within this management plan are . followed, sedimentation and erosion potential should be greatly decreased in the Little Mahoning Creek watershed. By working with local conservation partners and leveraging funding and effort, numerous projects can be completed with modest financial resources. All projects should benefit numerous types of aquatic and terrestrial species within the watershed, while providing a critical source of clean water to the Allegheny and Ohio River system. Another desired outcome would be the further growth of LMCWA through generated interest as a result of conservation project activity and success, as well as further education and outreach.

d. Success Measurements and Monitoring Approach

Monitoring is an important aspect of any restoration effort. The ability to have baseline and post-construction data sets makes success measurements easier to quantify and describe. Monitoring can be as intensive or minimal as time and personnel allow. At a minimum, WPC recommends macroinvertebrate data be collected for a season (Fall or Spring) before a project is constructed (Fig.9). Post construction monitoring should be conducted in the same season that the pre-construction monitoring occurred due to changes in macroinvertebrate life cycles. Water quality monitoring should include base flow conditions as well as high water events in an attempt to determine minimum and maximum conditions. Parameters to monitor should include several standard measurements like pH, dissolved oxygen, total dissolved solids, conductivity, and turbidity. Certain types of projects will also monitor other less commonly measured parameters, such as phosphate and nitrogen for agricultural BMPs and total acidity, total manganese, and total aluminum for AMD-specific projects.

Implementation

LMCWA has successfully completed numerous projects in partnership with WPC and many others. The group should continue to follow the recommendations of this plan while building upon the momentum established from prior successes. LMCWA and its members should explore opportunities to become involved with activities such as water quality monitoring, which will allow them to better understand improvements or impairments. This will be of particular importance with the boom of the natural gas industry and the eventual exploration of the watershed.

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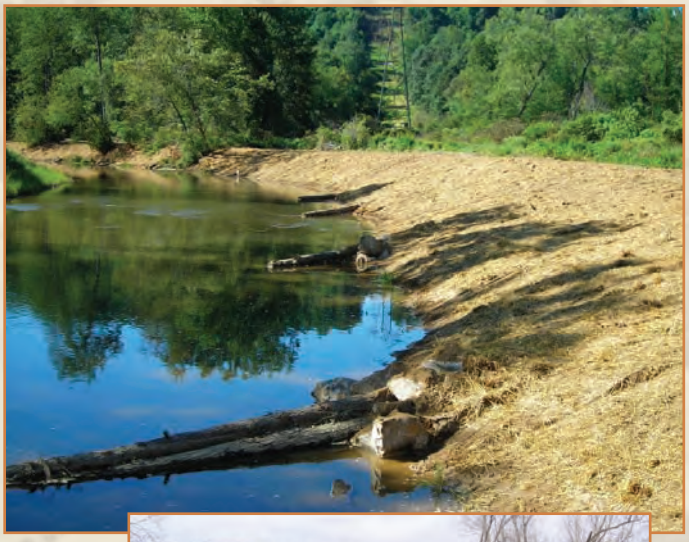


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a. Project Recommendations

WPC has compiled a list of recommendations for LMCWA to take into consideration while prioritizing the needs of the watershed over the next three to five years. The focus should be in areas that WPC has visually assessed and highly visible areas that inform the community of the work being done to improve the watershed. Example projects include:

- Continue working with local townships and conservations districts regarding dirt and gravel road issues
- Develop good relationships with farmers and discuss the possibility of implementing conservation practices on their operations
- Focus agricultural conservation efforts within Ross Run subwatershed working closely with WPC. This is a DEP high priority watershed and significant Growing Greener funds have been allocated for this area
- Continue to engage the community, including students, by conducting education and outreach events
- Establish good relationships with natural gas exploration companies to promote better conservation practices
- Continue stream bank restoration and fish habitat projects in critical areas as identified by the WPC visual assessment (fig.7)

Plan Evaluation & Evolution

This plan was developed to aid LMCWA with prioritizing restoration efforts on the sources of critical threats to the watershed. As with any plan, new information will become available and it will be included in this living document. Continued scientific technical assistance will be provided by WPC in the coming years to assist with plan implementation. This version of the management plan should be relevant for the next three to five years before requiring significant revision.

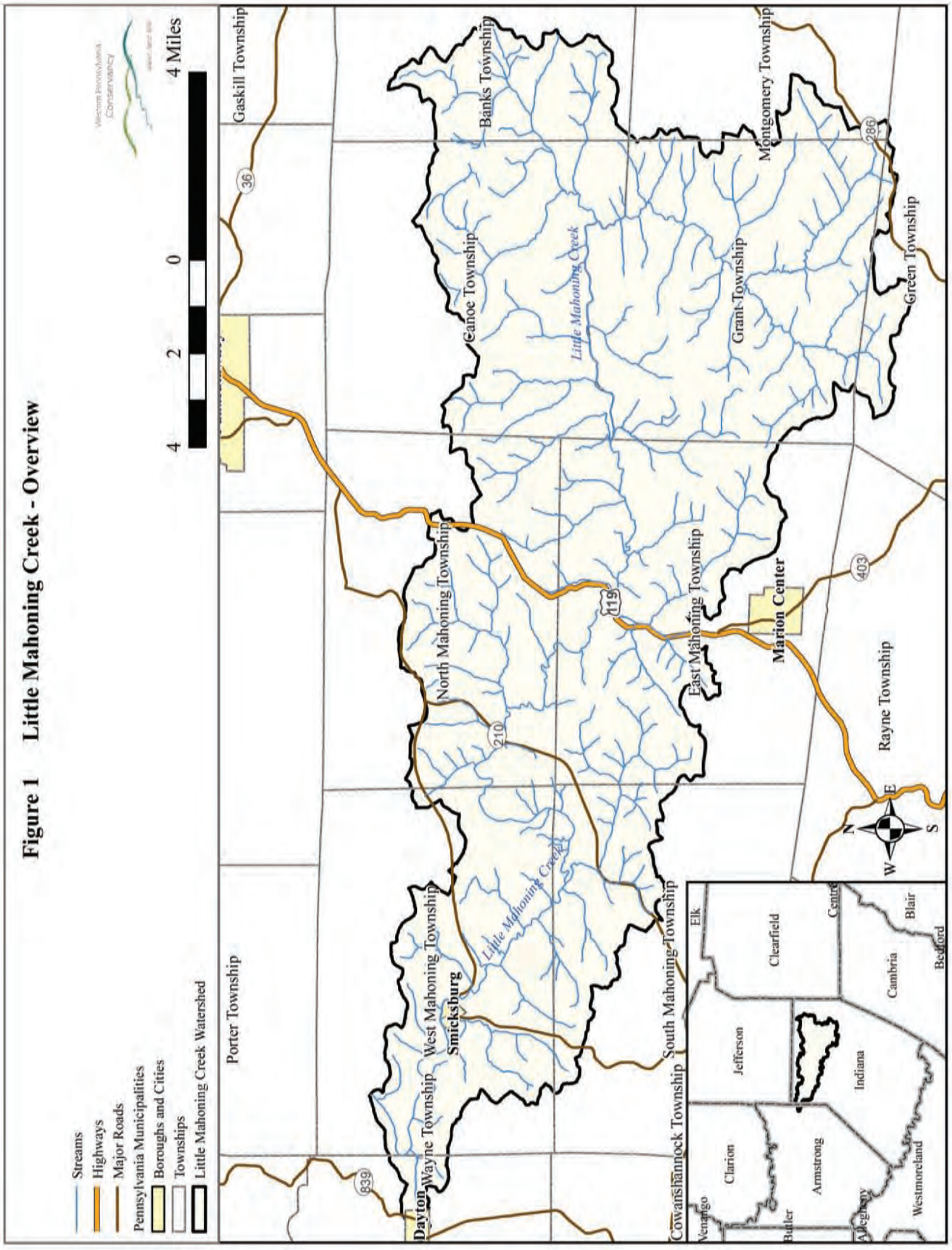
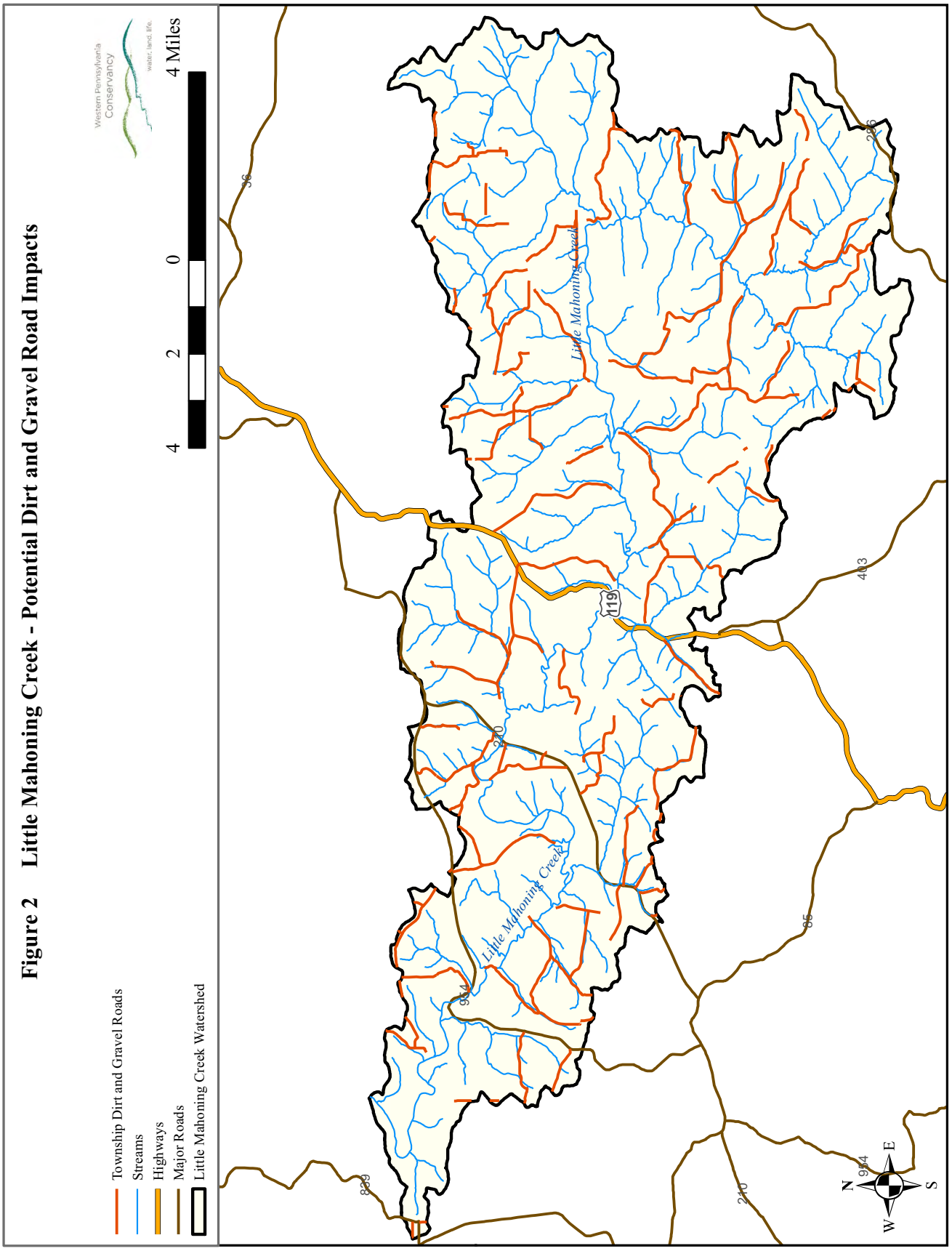
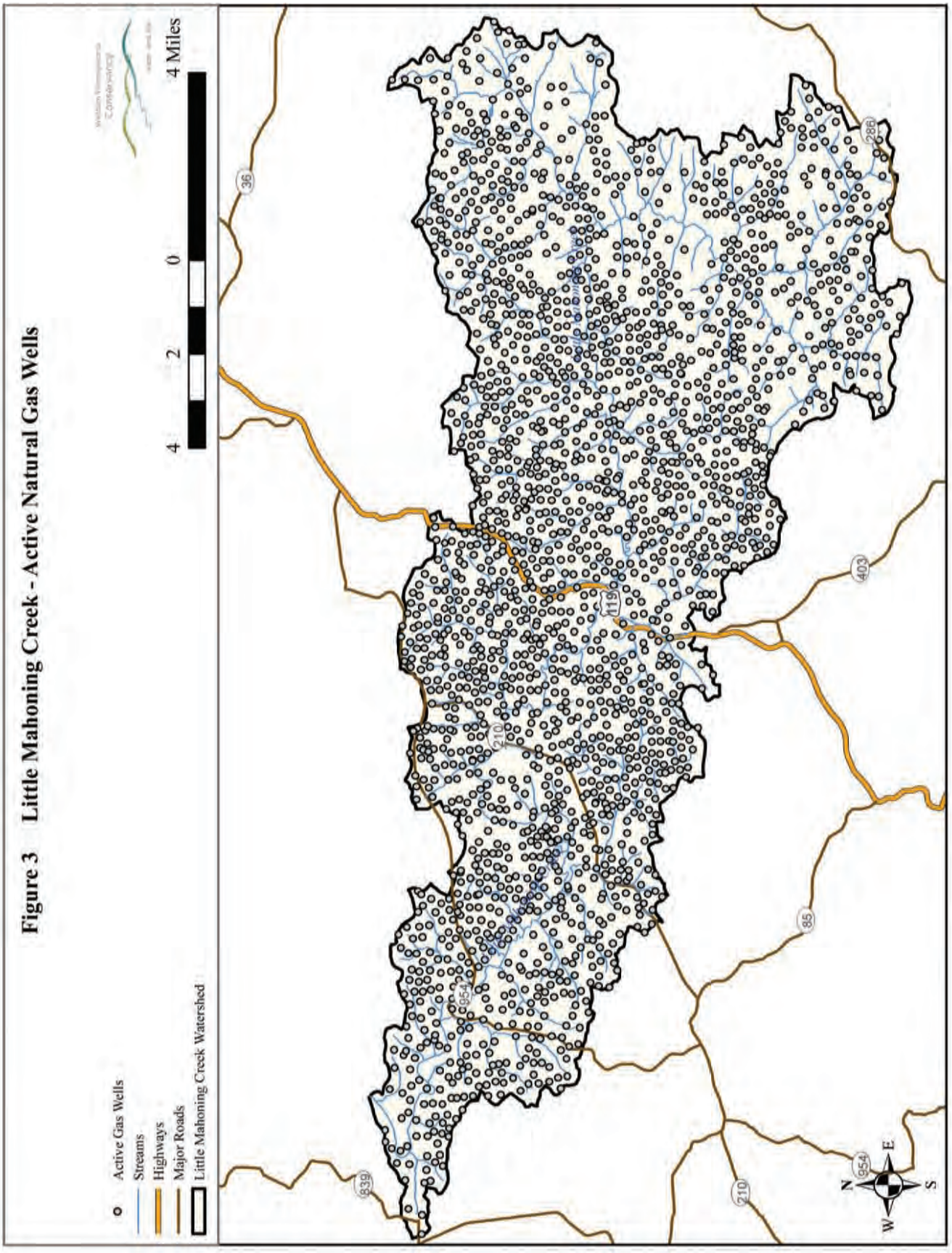


Figure 1 Little Mahoning Creek - Overview
Streams
Highways
Major Roads
Pennsylvania Municipalities
Boroughs and Cities
Townships
Little Mahoning Creek Watershed
4 2 0 4 Miles
Gaskill Township
Banks Township
Ganoe Township
Montgomery Township
Grant Township
Green Township
Little Mahoning Creek
North Mahoning Township
East Mahoning Township
Marion Center
Rayne Township
Porter Township
Dayton
Wayne Township
West Mahoning Township
Smicksburg
South Mahoning Township
Cowanshannock Township
Little Mahoning Creek
36
286
403
119
210
839
N
E
S
W
Venango
Clarion
Butler
Armstrong
Allegheny
Westmoreland
Indiana
Jefferson
Elk
Clearfield
Centre
Cambria
Blair
Bedford

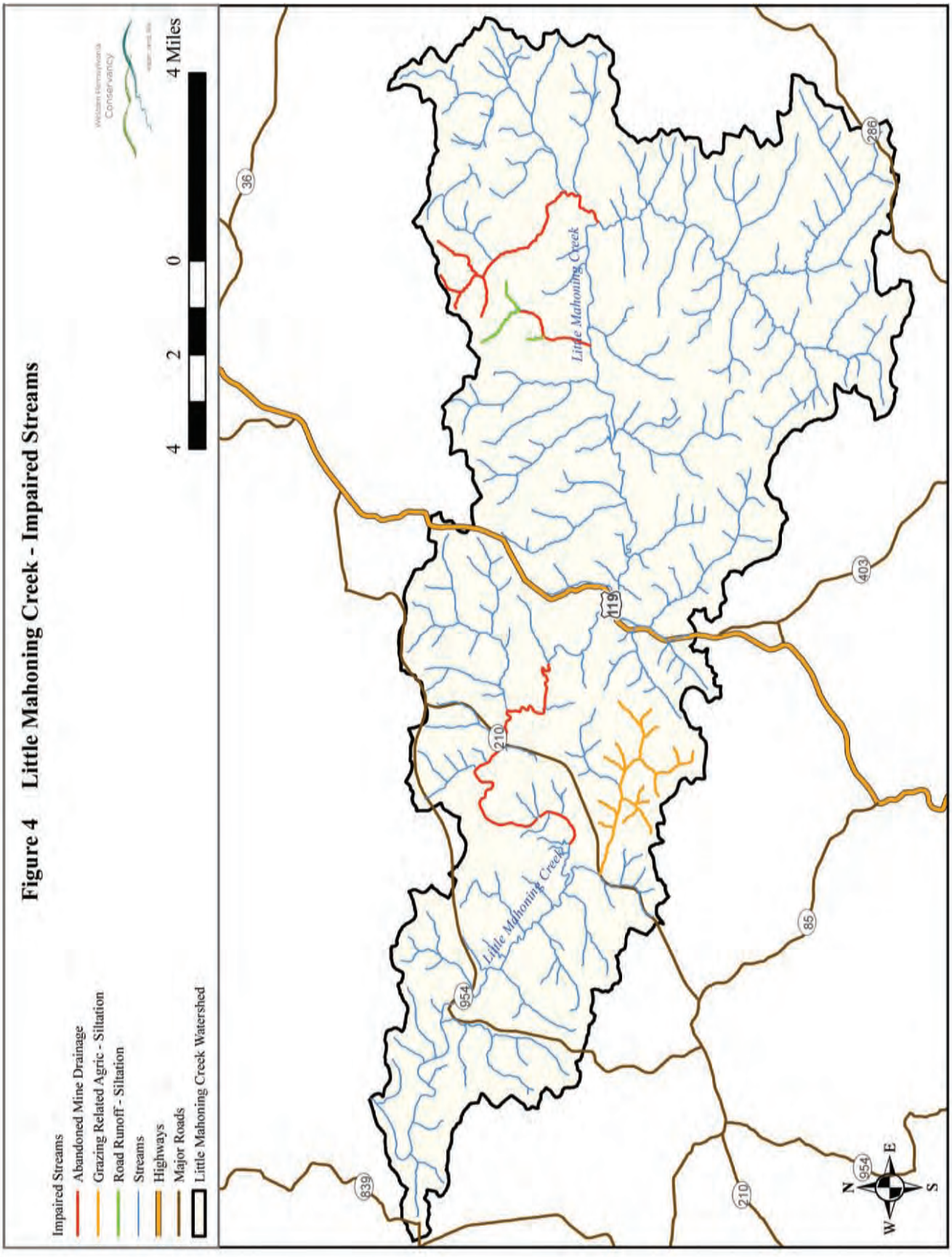
Potential Dirt & Gravel Road Impacts



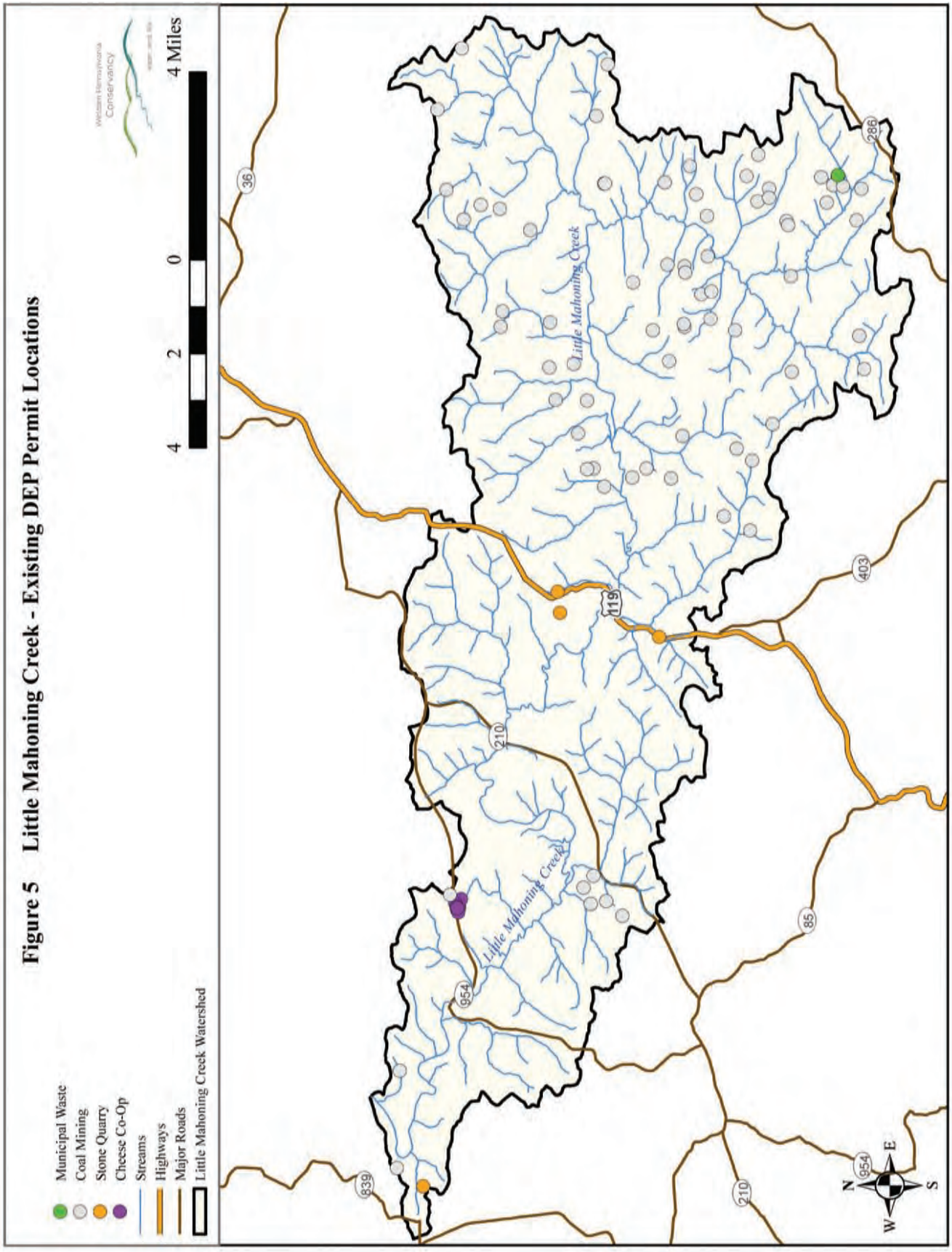
Active Natural Gas Wells



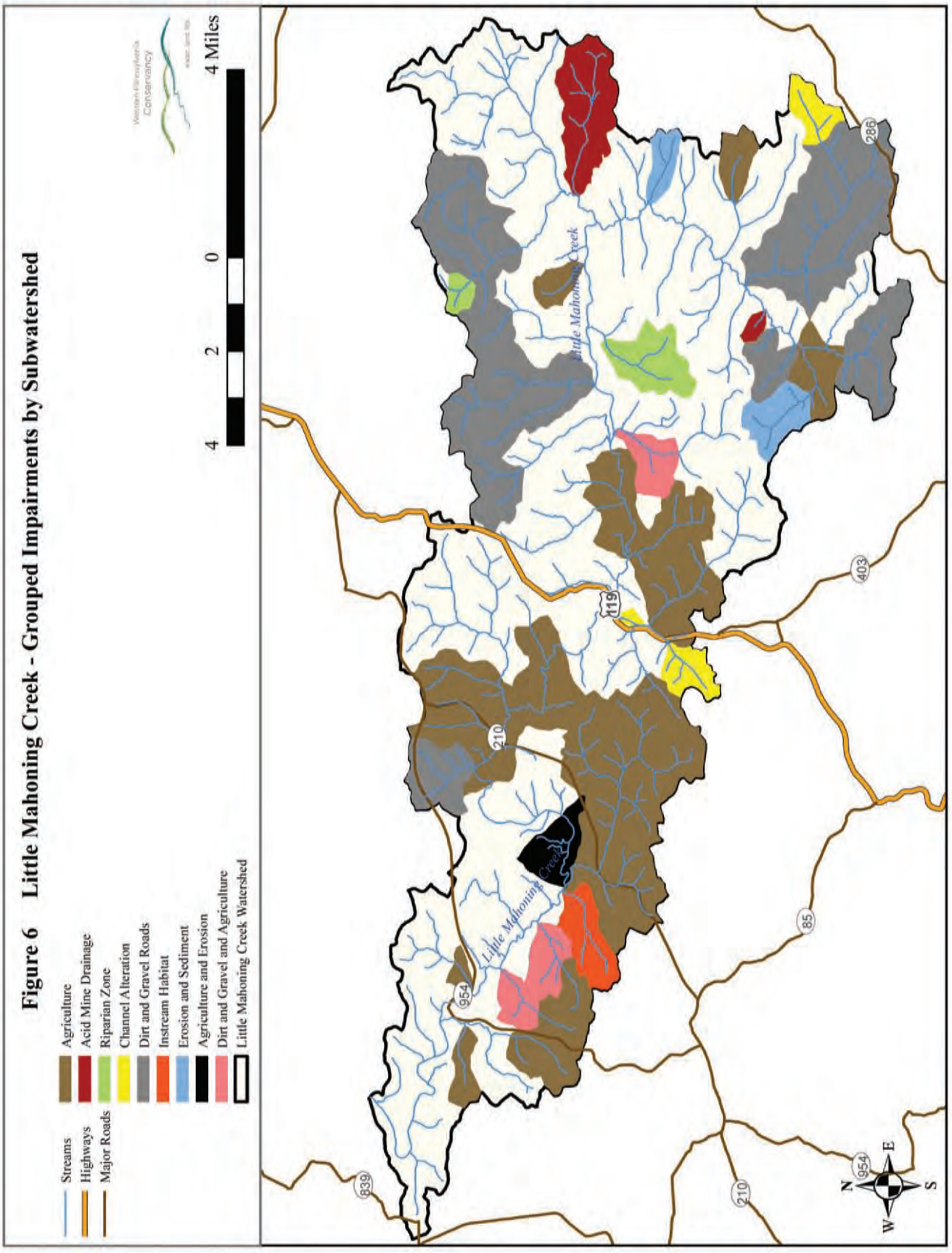
Impaired Streams



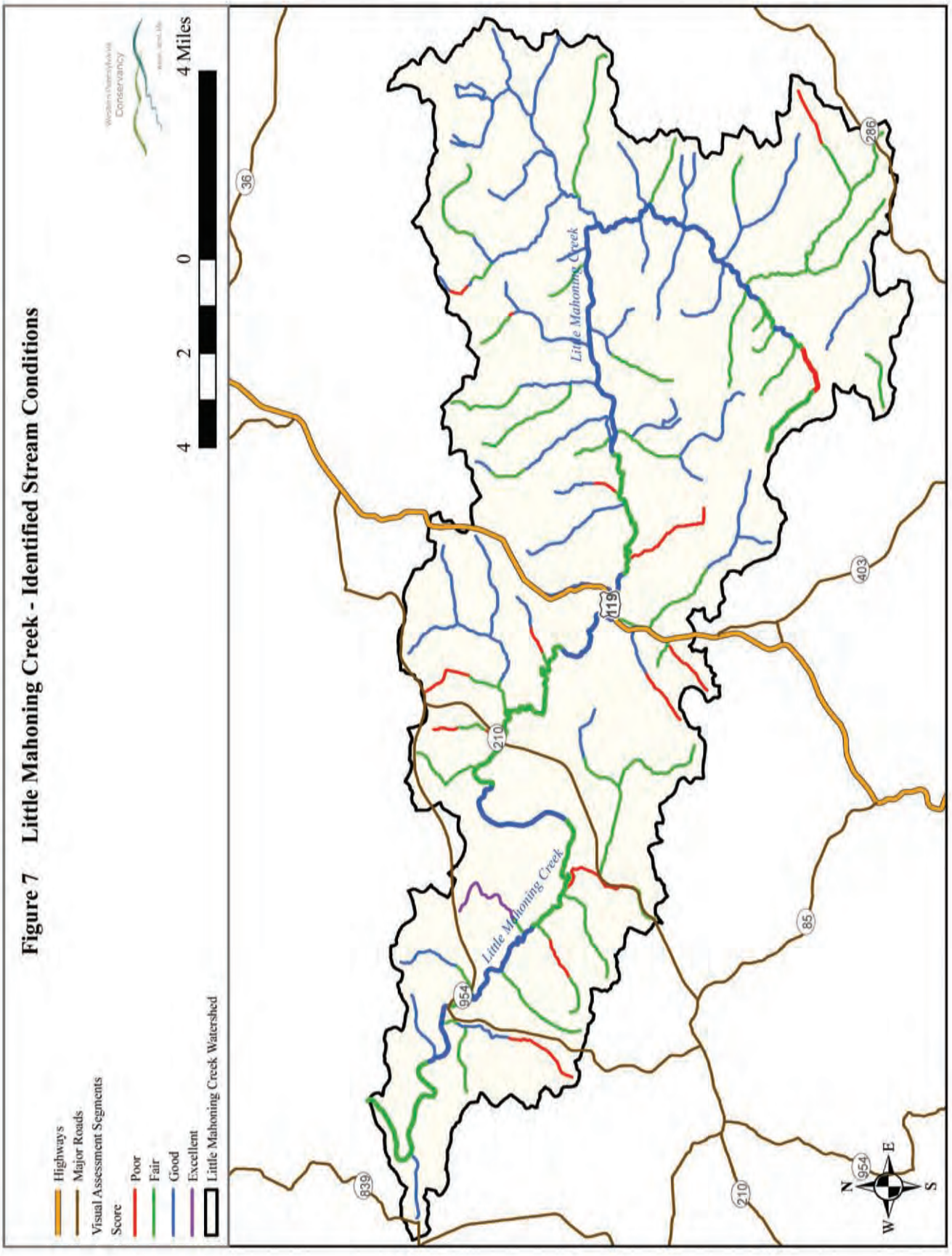
Existing DEP Permit Locations



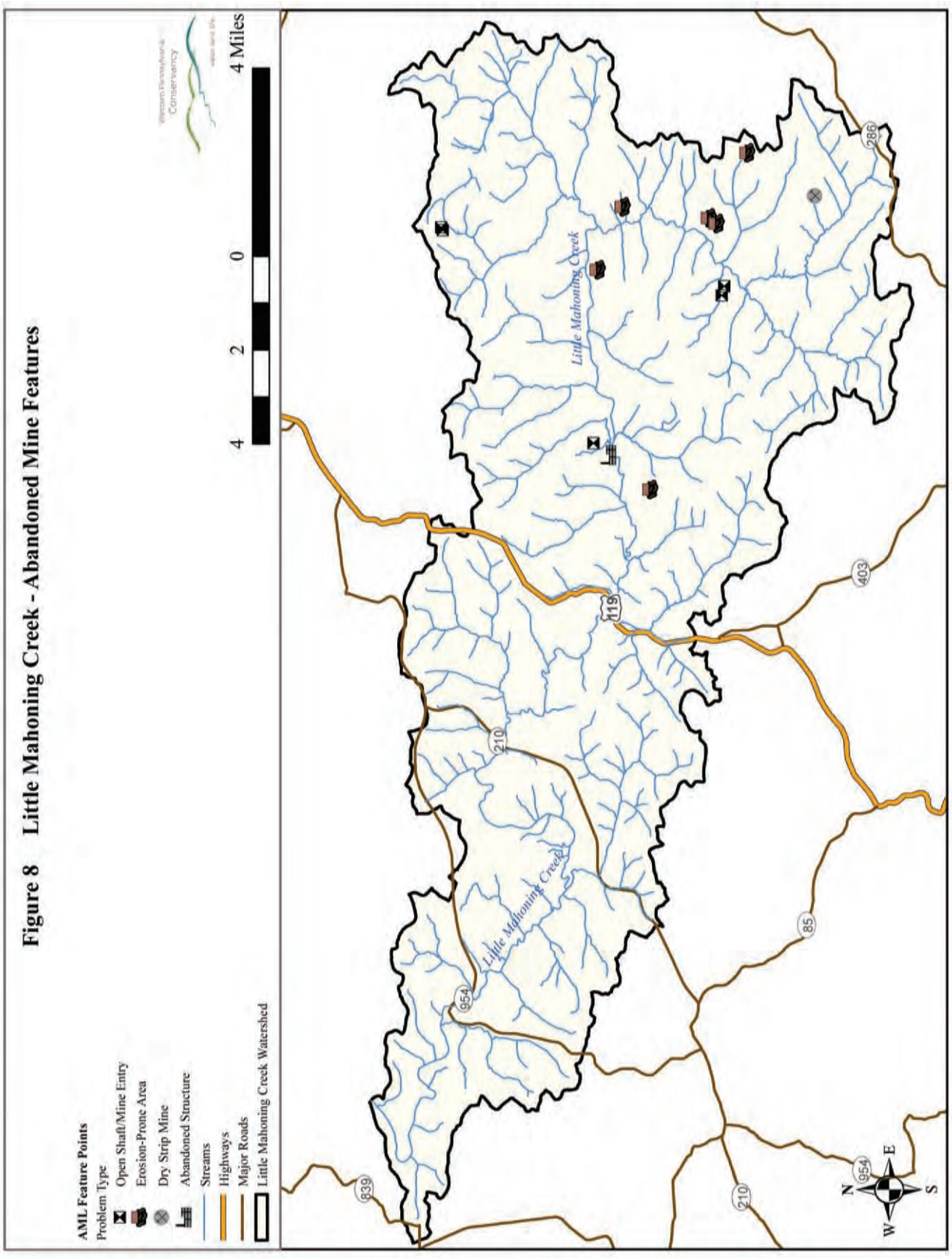
Grouped Impairments by Subwatershed



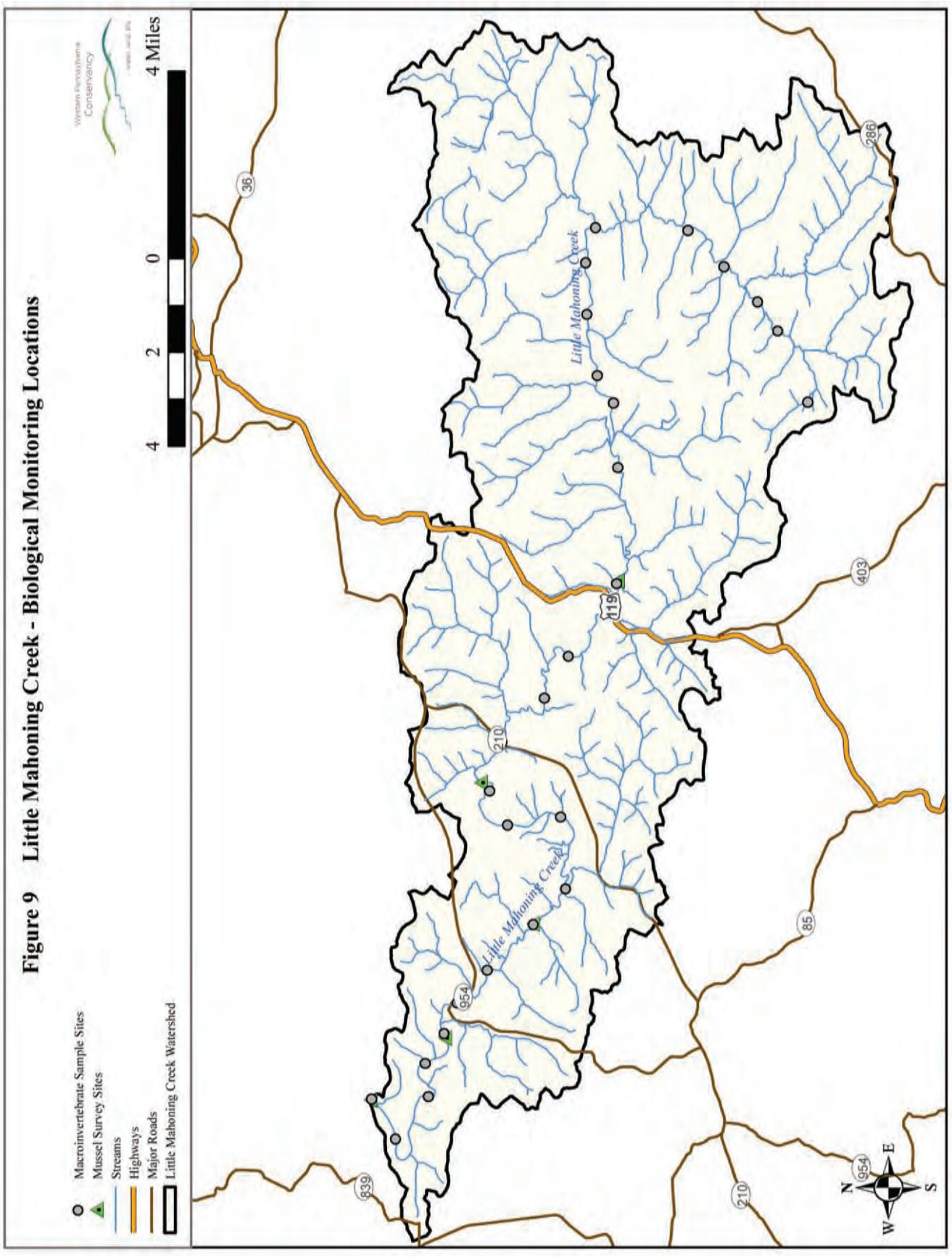
Identified Stream Conditions



Abandoned Mine Features



Biological Monitoring Locations



LITTLE MAHONING CREEK WATERSHED

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Indiana County, Pennsylvania

Western Pennsylvania Conservancy
water, land, life.

Foundation for Pennsylvania Watersheds

Bayer Center for Nonprofit Management