MIDDLE LOYALHANNA CREEK WATERSHED

a. Overall Introduction
b. Middle Loyalhanna Creek Watershed
c. Coalpit Run
d. Fourmile Run
e. Miller Run
f. Ninemile Run
g. Monastery Run
h. Saxman Run

SECTION 2
MIDDLE LOYALHANNA CREEK WATERSHED

Overall Restoration Priorities for the Upper Loyalhanna Creek Section

- Remediate AMD discharges located in MIDLOYG, a main stem segment of the Loyalhanna Creek that passes through downtown Latrobe.
- Remediate AMD discharges in the Saxman Run Subwatershed.
- Improve passive treatment of AMD discharges taking place in the Monastery Run Subwatershed.
- Address source of AMD Discharge located in Ninemile Run Subwatershed. Removal of remaining coal refuse could eliminate discharge.
- Address agricultural non-point source pollution throughout the headwater section of the Fourmile Run Subwatershed.
- Remediate streambank erosion along the main stem of Ninemile Run, especially in segments B, D, and H.
- Initiate community outreach program to educate landowners about the importance of enhancing and maintaining stream side vegetation.

110.11
SQUARE MILES

Section 2 – Middle Loyalhanna Creek Watershed

General Description

The middle section of the Loyalhanna Creek Watershed extends from the confluence with Twomile Run to the confluence with Saxman Run. The Loyalhanna Creek experiences significant changes as it flows north away from Ligonier and through Latrobe. The upper part of the middle section is primarily forested and passes through the Loyalhanna Gorge, a natural area protected by the Westmoreland County Bureau of Parks and Recreation. Upon reaching Latrobe, however, the landscape surrounding the Loyalhanna Creek changes and becomes primarily residential and urban.

Similar to the upper section of the watershed, there are areas within the middle section that were deep mined and surface mined for coal. Those areas are much more prevalent in and around Latrobe. At one time, the area was known for coal mining and associated industries such as coke production and steel fabrication. Today, there is hardly any coal mining taking place, but the remnants of the mining remain in the form of abandoned mine drainage (AMD).

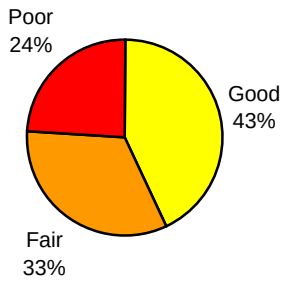
The Middle Loyalhanna Creek section is comprised of seven named tributaries and 10 unnamed tributaries. For the purpose of the assessment, each of the named tributaries was assessed separately. The main stem of the Loyalhanna Creek and its unnamed tributaries was assessed as a separate section. Therefore, the following subwatershed reports are included within Section 2:

- Middle Loyalhanna Creek Main Stem and Unnamed Tributaries
- Coalpit Run
- Fourmile Run
- Miller Run
- Ninemile Run
- Monastery Run
- Saxman Run

Overall Visual Assessment Summary

The visual assessment of the Middle Loyalhanna Creek Watershed was completed in the spring of 2004. As depicted in Figure 2.1, 43% of the middle watershed received a good rating, 33% received a fair rating, and 24% received a poor rating. An average score of 6.96 was given to the entire middle section, which is a fair rating overall.

Figure 2.1: Middle Loyalhanna Creek Watershed Overall Ratings



Assessment ratings for the middle section of the watershed reflected an increasing number of impacts. As the Loyalhanna Creek flows north, the assessment ratings for the main stem, as well as its subwatersheds, decreased overall. This is due to the population increase in and around Latrobe, increased agriculture, and increased impacts from coal mining. Each subwatershed report describes those impacts in further detail.

Derry
Saxman Run Subwatershed
Latrobe
217
Greensburg
Miller Run Subwatershed
Coalpit Run Subwatershed
Monastery Run Subwatershed
30
Middle Loyalhnna Creek Subwatershed
259
Youngstown
981
982
30
Ninemile Run Subwatershed
711
Ligonier
30
Fourmile Run Subwatershed
381
130
711
31
Donegal
76
70
N

Streams
Major Roads
Boroughs and Cities
Coalpit Run Subwatershed
Ninemile Run Subwatershed
Monastery Run Subwatershed
Fourmile Run Watershed
Saxman Run Subwatershed
Miller Run Watershed
Middle Loyalhanna Creek Subwatershed

Middle Loyalhanna Creek Watershed

Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center

Map 2.1

1 0.5 0 1 Miles

Derry
Saxman Run Subwatershed
Latrobe
Greensburg
Miller Run Subwatershed
Coalpit Run Subwatershed
Monastery Run Subwatershed
Middle Loyalhnna Creek Subwatershed
Youngstown
Ninemile Run Subwatershed
Ligonier
Fourmile Run Subwatershed
Donegal
217
30
981
982
259
711
381
130
31
76
70
N

- Poor
- Fair
- Good
- Major Roads
- Boroughs and Cities
- Coalpit Run Subwatershed
- Ninemile Run Subwatershed
- Monastery Run Subwatershed
- Fourmile Run Watershed
- Saxman Run Subwatershed
- Miller Run Watershed
- Middle Loyalhanna Creek Subwatershed

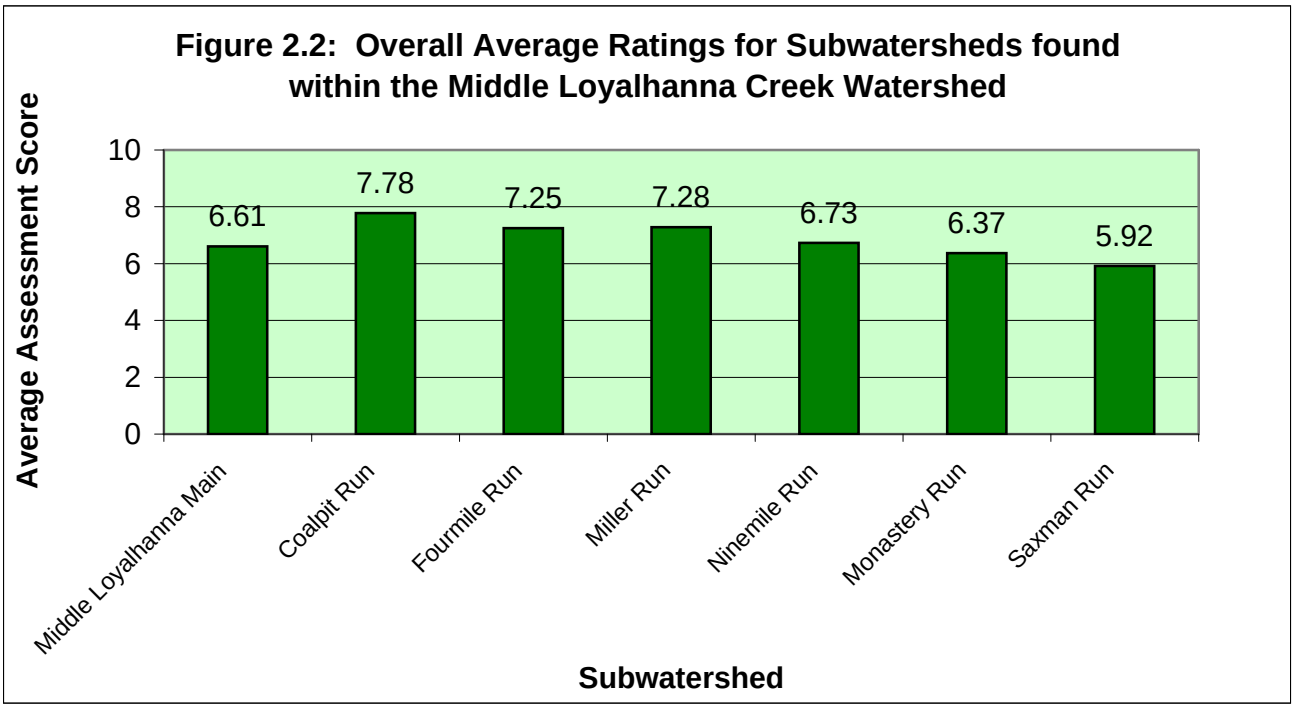
Middle Loyalhanna Creek Watershed: Overall Ratings

Map 2.2

Western Pennsylvania Conservancy • Est. 1932 •
Watershed Assistance Center

1 0.5 0 1 Miles

Figure 2.2 exhibits the average overall rating for each subwatershed located within the Middle Loyalhanna Creek Watershed section. As depicted, the overall ratings decrease as the Loyalhanna Creek flows north. Saxman Run, the last subwatershed to enter the main stem within the middle section, rates the lowest due to large impacts from AMD.



Overall Conclusions

The impacts found throughout the Middle Loyalhanna Creek Watershed section varied greatly. The most severe impact, however, is AMD. It affects a large portion of the middle section through downtown Latrobe as a result of large discharges within the Saxman Run Subwatershed as well as along the main stem.

Multiple projects are underway to address AMD in and around Latrobe. Those projects include the Latrobe Foundation Property Project, Monastery Run Improvement Project, and the Saxman Run Initiative. All three projects are coordinated by a consortium of partners that includes Saint Vincent College, Loyalhanna Watershed Association, DEP, Westmoreland Conservation District, and others. Future community outreach to engage the Latrobe community in cleanup efforts will be critical to the success of all of these projects.

Loyalhanna Creek as it flows through the Loyalhanna Gorge between Ligonier and Latrobe

In addition, it is important to highlight the high-quality portions of the middle watershed, including the Loyalhanna Gorge. Although they do not require immediate restoration, they are important to monitor and maintain.

SECTION 2.A
MIDDLE LOYALHANNA CREEK SUBWATERSHED

Section 2.A

Middle Loyalhanna Creek Subwatershed

General Description

The Middle Loyalhanna Creek Subwatershed includes the area that drains portions of Ligonier, Unity and Derry townships. This 14.86 square-mile section begins downstream from the Twomile Run confluence, west of Ligonier, and ends directly downstream of the confluence with Saxman Run, just outside of downtown Latrobe.

Flowing westward out of Ligonier, the middle section meanders through a landscape similar to the upper section. It is surrounded by a mix of forests, fields, and rural homesteads. Upon reaching Latrobe, however, the character of the Loyalhanna Creek changes. The landscape becomes crowded with homes, businesses, industry, and roads. The creek becomes channelized and water quality impacts increase as a result of that changed landscape.

Looking downstream from the Darlington Road Bridge in Ligonier

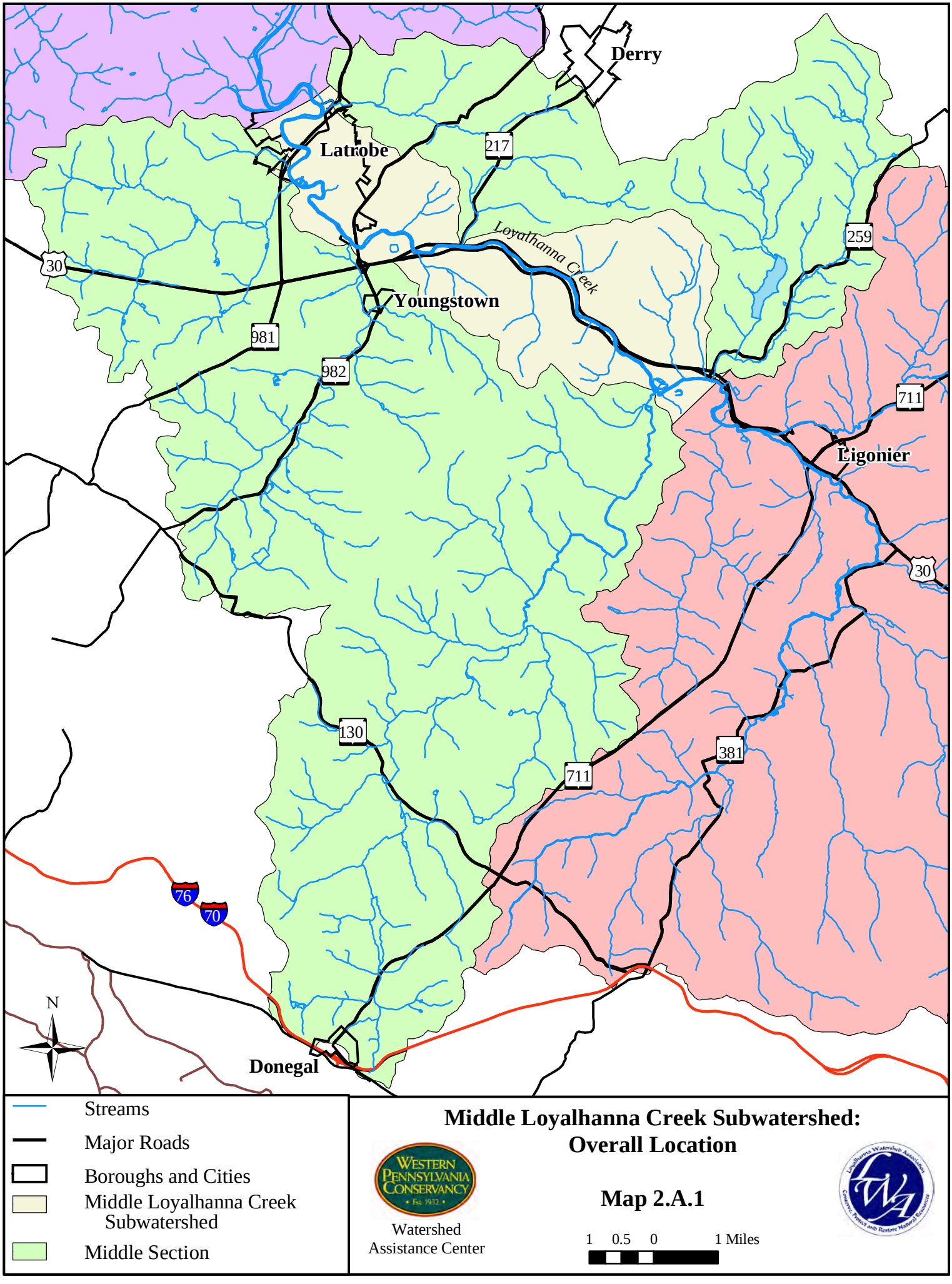
Six named tributaries and 10 unnamed tributaries join the main stem of the Loyalhanna Creek in the middle section. The named tributaries include: Fourmile Run, Coalpit Run, Miller Run, Ninemile Run, Monastery Run, Unity Run, and Saxman Run.

The beginning of the Middle Loyalhanna Creek Subwatershed is located downstream from the confluence of Twomile Run directly behind the Lady of the Lake Bed and Breakfast outside of Ligonier. From that point, the Loyalhanna Creek flows parallel to Route 30 through an area mixed with farm, forest, and residences. Approximately 1 mile downstream, **Coalpit Run** joins the main stem from the north. This subwatershed flows from the east side of Chestnut Ridge, draining steep terrain similar in composition to Laurel Ridge. The Coalpit Run Subwatershed provides water to the Latrobe Reservoir, drinking water source for the City of Latrobe. Coalpit Run is rated a Cold Water Fishery (CWF) and received a good overall rating during the visual assessment.

As the Loyalhanna Creek continues to flow west away from Ligonier, it passes through Idlewild Park. Directly downstream of the park, **Fourmile Run** enters from the south. Fourmile Run is a large tributary that originates close to the Pennsylvania Turnpike's Donegal Interchange. It drains a rural landscape scattered with farms and homes. It is classified as a Trout Stocked Fishery (TSF) and rated good overall during the visual assessment.

Several homes are concentrated along the creek banks between the entrance of Fourmile Run and the opening to the Loyalhanna Gorge. Created by centuries of flowing water, the gorge cuts through the layers of sandstone, limestone, and shale that comprise Chestnut Ridge. Its steep banks are scattered with large boulders and oak and pine trees. Westmoreland County Bureau of Parks and Recreation owns and protects a majority of the land in and around the gorge. Route 30 flanks both sides of the creek and is the main travel route into Latrobe from the east. At one time, the railroad traveled the same path. Passing through the gorge, Loyalhanna Creek collects flow from four unnamed tributaries.

After flowing through the gorge, the Loyalhanna Creek emerges on the western side of Chestnut Ridge on the outskirts of Latrobe. It slows as it approaches the Kingston Dam at the intersection of Route 30 and Route 217. In place since the late 1800s, the dam serves as the back up water supply for the City


Derry
Latrobe
217
Loyalhanna Creek
259
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711
Ligonier
30
130
381
711
76
70
N
Donegal
Streams
Major Roads
Boroughs and Cities
Middle Loyalhanna Creek Subwatershed
Middle Section
Middle Loyalhanna Creek Subwatershed: Overall Location
Map 2.A.1
Western Pennsylvania Conservancy
Watershed Assistance Center
1 0.5 0 1 Miles

of Latrobe. An average flow of 335 cubic feet per second passes by the USGS Gauging Station immediately downstream of the dam. **Miller Run**, a small tributary to the middle main stem, enters the Loyalhanna Creek below the Kingston Dam. It flows from the west side of Chestnut Ridge and is classified as a High Quality Cold Water Fishery (HQ-CWF). During the visual assessment, Miller Run was rated fair overall.

Looking upstream from the Kingston Dam at the junction of Route 217 and Route 30.

After winding through an open floodplain area, the Loyalhanna Creek takes a large turn northward toward the City of Latrobe. The main stem passes underneath the Route 982 Bridge and, 500 feet downstream, **Ninemile Run** enters from the south. Ninemile Run is a large subwatershed that drains the communities of Whitney, Hostetter, Baggaley, and Youngwood. It originates on the west side of Chestnut Ridge south of Latrobe. It is classified as a Warm Water Fishery (WWF) and rated fair overall during the visual assessment. The Ninemile Run subwatershed includes one HQ-CWF, Indian Camp Run.

As the Loyalhanna Creek enters Latrobe, the creek banks become populated with active and inactive industry, businesses, and residences. The presence of past and current industry is apparent on the northeast side of the stream as large buildings and brownfield areas are visible. Directly across from Legion Keener Park in downtown Latrobe, **Monastery Run**, enters the Loyalhanna Creek from the southeast. This large tributary contains AMD and, upon meeting the Loyalhanna Creek, adds iron oxide sediment to the creek. Treatment systems upstream at Saint Vincent College have significantly reduced the impact of AMD made upon the Loyalhanna Creek by Monastery Run. Monastery Run is classified as a WWF and rated fair overall during the visual assessment.

Downstream of the confluence with Monastery Run, the Loyalhanna Creek enters into the heart of downtown Latrobe. The streambank is channelized in order to alleviate flooding within the downtown area of Latrobe. Continuing through Latrobe, the Loyalhanna Creek is surrounded by homes and/or businesses on both banks. After passing underneath the Route 981 Bridge, the Loyalhanna Creek continues to flow through a populated region. Not until reaching the outskirts of the city does population concentration decrease. It is also at this point that channelization becomes less apparent. The U.S. Army Corps of Engineers' (USACE) flood control project begins just outside of downtown Latrobe. It is in this area that the entire Loyalhanna Creek was moved and straightened. For more information about that project, please contact the USACE.

Saxman Run is the last tributary to enter the main stem of the middle Loyalhanna Creek section. Heavily impacted by AMD, Saxman Run contributes a large amount of iron oxide to the creek as it makes its way out of Latrobe. Saxman Run enters the main stem directly behind the Latrobe Sewage Treatment Plant. It is classified a WWF and was rated poor overall during the visual assessment. Immediately following a confluence with Saxman Run, the middle section of the Loyalhanna Creek ends at the outskirts of the City of Latrobe.

The Middle Loyalhanna Creek Subwatershed is classified as a CWF. For geographic location of this subwatershed, please refer to Map 2.A.1.

Review of Historic Information

Overall Summary

A majority of the existing historic information for the Middle Loyalhanna Creek Subwatershed focuses primarily upon coal mining and its effects. This is due to the fact that coal mining has had such a significant impact on this portion of the watershed. Once the center of major productions of coal, coke, and steel, Latrobe had more than 11 deep mines and three steel mills operating during the early part of the 1900s. Most of the community was built around the industry that is no longer central to the area economy.

Today, industry in Latrobe focuses on specialty steels and tool steels. Companies such as Timken, and Kennametal operate successful businesses. Smaller, varied businesses are also scattered throughout the community. In addition, two major beverage producers utilize water from the Loyalhanna Creek in their operations, Latrobe Brewing Company and LeNatures. Together they draw more than 400,000 gallons of water from the city water source (Latrobe Reservoir) each day.

PA Fish and Boat Commission (PAFBC)

In 1994, the PAFBC completed a fish survey of the Loyalhanna Creek in downtown Latrobe. The main stem was surveyed upstream and downstream from the mouth of Monastery Run. The purpose of the survey was to identify and count fish species in the creek prior to AMD remediation occurring upstream on Monastery Run. Electro-fishing in the Loyalhanna Creek upstream section resulted in the collection of 12 species. Small mouth bass and excellent densities of minnows dominated the sample. Downstream of the confluence with Monastery Run, fewer fish were collected and only 10 species were classified.

It was noted that Monastery Run contained large amounts of iron sediment due to abandoned mine discharges located upstream. The PAFBC concluded that the passive treatment system to be installed at Saint Vincent College upstream on Monastery Run would significantly improve fish habitat in the Loyalhanna Creek.

PA Department of Environmental Protection (DEP)

There are multiple existing files that describe surface mining throughout the Middle Loyalhanna Creek subwatershed. A majority of the surface mining took place in the 1970s and 1980s. For the purpose of the assessment, those sites were reviewed, but will not be included within the report. To obtain information about those sites, please visit the DEP District Mining Office in Armburst, Pa.

The following files provided information about the Middle Loyalhanna Main Stem section:

1. Valley – Vulcan Mold and Iron Works: This formal industrial site was in operation from 1920-1980. Metals from processing wastes were being carried into the Loyalhanna from the site located on the north bank about 2,000 feet downstream of the Route 982 Bridge over the Loyalhanna. Most recently, a remediation company has been separating slag and foundry sand in order to remove materials causing problems. Part of the site is used for storage of various materials from the operating Timken Latrobe Steel mill, and the rest remains vacant. The DEP file covering this site includes various water samples taken upstream and downstream of the brownfield area. Samples show no significant presence of heavy metals, acidic water, or high levels of sulfates. That is a result of removal of metal producing materials.
2. American Cyanamid – "Cap Works": An industrial site that was used prior to 1928 to process coke within on-site coke ovens. Between 1928 and 1970, General Explosives and American

Cyanamid operated on site producing and storing explosives. There were several investigations carried out between 1988 and 2000 showing the presence of heavy and toxic metals in the soil and groundwater on the property. DEP reports indicate that landowners planned to remediate the site. To date, wastewater ponds, coke ovens, and other outbuildings are absent or buried.

3. Amerikohl Surface Mine – Clark Hollow: At the time of this report, Amerikohl Mining was completing a surface mine on the ridge above Clark Hollow Road. Clark Hollow Road is on the western side of Ligonier Township. This mine was the first of three surface mines to be completed beginning in 2000. Water samples were taken surrounding the perimeter of the mining site and no significant pollution problems were noted in any of the collected samples.
4. An abandoned drift/deep mine exists on Clark Hollow Road. The mine was in operation during the early to mid-1900s until the 1980s. Mining buildings and entrances are still noticeable and accessible. Water flowing from the mine entrance has a pH of 4.1 and contains low levels of aluminum and iron. The discharge flows into an unnamed tributary to the Loyalhanna Creek. That tributary shows no significant impact from the discharge.

Saint Vincent College

In 1997, the first of three large passive treatment systems was constructed to treat AMD along Fourmile Run. By 2000, the three systems were operational and treating as much as 6,000 gpm of flow. A large amount of data is available showing water quality from the systems, Fourmile Run, Monastery Run, and the Loyalhanna Creek main stem. Please contact Saint Vincent College for water quality information.

Loyalhanna Watershed Association

Since the summer of 2001, water quality samples have been collected at a series of discharges. Those discharge sites are described and listed with water quality information in Appendix 3. The discharges are the Adelphoi Borehole, Adelphoi Pipe, Latrobe Discharge, and Unity Discharge.

Bituminous Coal Mines of Westmoreland County – Website

A website produced by Raymond A. Washlaski, Ryan P. Washlaski, and Peter E. Starry, Jr. lists the coal mines that were once operational throughout the county. Referencing the website, the following deep mines were named that once operated within the middle subwatershed section of the Loyalhanna Creek Subwatershed.

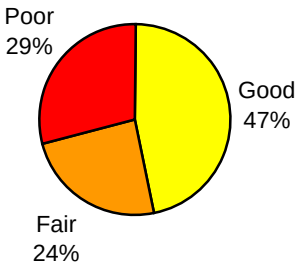
Middle Loyalhanna Creek Subwatershed Discharges Catalogued During Scarlift			
Mine	**Years in Operation**	**Last Known Operator**	**Location**
Baggaley Mine and Coke Works	1896 – 1922	HC Frick	In Baggaley, PA north of Latrobe, within the Ninemile Run Subwatershed.
Dorothy Mine	1899 – 1926	HC Frick	Located on the east side of old PA Route 981 North, less than one mile from the Route 30 intersection.
Monastery Mine and Coke Works	1870s – 1913	Unknown	At the base of Saint Vincent College, close to the current town of Saint Vincent Shaft.

Atlantic Mines #1 and #3	1890 – 1940	Atlantic Crushed Coal and Coke	East of Latrobe and southwest of Bradenville in the Saxman Run Subwatershed.
Latrobe #1 Mine and Coke Works (Drift Mine)	1880 – 1922	Latrobe Coal and Coke Company	Lloydsville
Whitney/Hostetter Mine & Coke Works	1889 – 1960s	HC Frick	Whitney/Hostetter in the Ninemile Run Subwatershed
M. Saxman Mine	1877 – 1914	Connellsville Coal and Coke Company	Saxman Run Subwatershed
Beatty Mine	1901 – 1930s	HC Frick	The entrance was at the Quick Crete property past the intersection of Beatty Flats Road and Beatty Road.
Pandora Mine	1894 – 1914	Loyalhanna Coal and Coke Company	Located along Latrobe-Derry Road within the Saxman Run Subwatershed.

Visual Assessment Summary

Visual Assessment Findings

Figure 2.A.1: Visual Assessment Ratings for the Middle Loyalhanna Creek Subwatershed

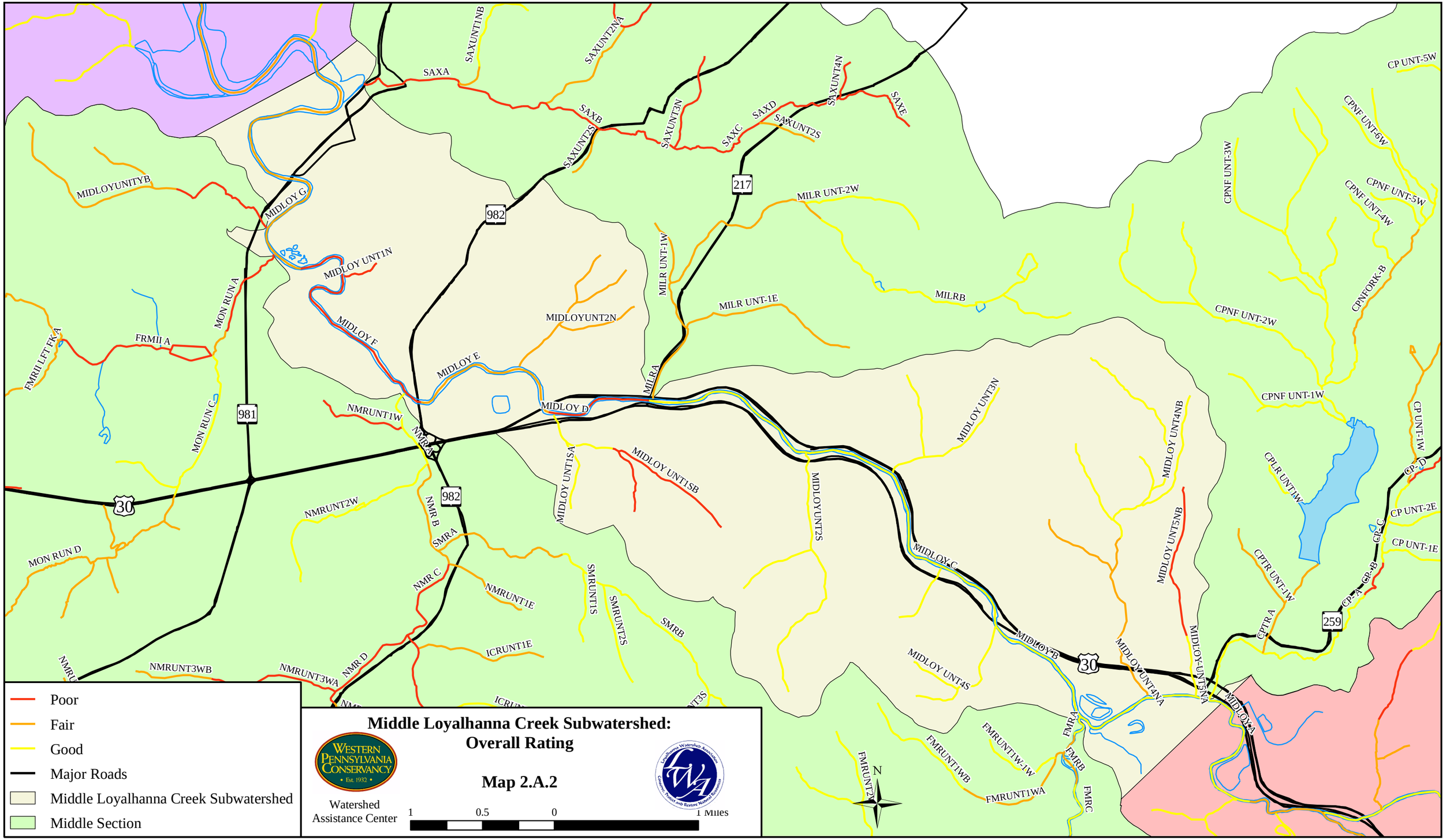


The visual assessment of the Middle Loyalhanna Creek Subwatershed was completed in January and May of 2004. The assessment included the main stem and all unnamed tributaries. In both months, heavy rainfall had occurred close to assessment dates. A total of 21 stream segments were assessed. As depicted in Figure 2.A.1, 47% rated good, 24% rated fair, and 29% rated poor. An average score of 6.61 was given to the entire subwatershed, which is a fair rating overall. The ratings given during the visual assessment reflect the presence of AMD, erosion, and lack of riparian vegetation throughout large portions of the subwatershed. Individual stream ratings are depicted in Map 2.A.2.

Visual Assessment Description

Middle Loyalhanna Creek Main Stem

The Middle Loyalhanna Creek Subwatershed begins just downstream from the confluence of the Loyalhanna Creek with Twomile Run. Surrounded primarily by forest, the Loyalhanna Creek flows westward out of Ligonier, in the direction of Idlewild Park, over a stream substrate dominated by cobble, gravel, and silt material. With the entrance of Coalpit Run and other small tributaries from the north, the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SAXE
CP UNT-5W
CPNF UNT-6W
CPNF UNT-3W
CPNF UNT-5W
CPNF UNT-4W
CPNFORK-B
CPNF UNT-2W
CPNF UNT-1W
CP UNT-1W
CP-D
CP UNT-2E
CP UNT-1E
CP-C
CP-B
CP-A
CPTR UNT-1W
CPTR A
CPLR UNT1W
MIDLOYUNITYB
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MIDLOY UNT1N
MON RUN A
FRMII A
FMRII LFT FK A
MON RUN C
MON RUN D
MIDLOY F
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Middle Section
Middle Loyalhanna Creek Subwatershed:
Overall Rating
Map 2.A.2
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
1 0.5 0 1 Miles

main stem changes in volume and width. Despite the addition of flow, very little change occurs within the creek environment.

Flowing parallel to Route 30, Loyalhanna Creek moves into the community of Darlington. **Fourmile Run** enters the main stem in Darlington, adding significant overall flow to the Loyalhanna Creek. Downstream of the confluence with Fourmile Run, increased sediment and algal growth occur. In addition, a lack of canopy cover and riparian vegetation is apparent. This lack of streamside vegetation is due primarily to a concentration of residences. On several occasions, unidentified runoff enters the main stem in Darlington. It is suspected that some of the runoff could originate from failing septic systems. The section of stream flowing through Darlington contains a more varied substrate than upstream sections. Large boulders are scattered throughout the stream channel.

As the Loyalhanna Creek flows into the Loyalhanna Gorge, the substrate turns to mostly boulder with less gravel and silt. The velocity of the creek increases and the channel width decreases. Through the gorge, the Loyalhanna Creek is flanked on both sides by steep, forested hillsides. At the base of each hillside, Route 30 travels its respective directions. A series of tributaries enter the main stem throughout the gorge. In the early spring of 2004, one of the streams was washed out creating a mudslide over the eastbound lane of Route 30, 500 yards upstream from the Hollow Tavern, a restaurant and bar.

On the northern side of the gorge, there is a large Loyalhanna Limestone quarry that is currently not being mined. The quarry has been in operation on and off throughout the past 60-70 years. Across the gorge on the southern side, an inactive open pit quarry can be found. Stones used to pave the streets of downtown Pittsburgh were cut many years ago from this particular quarry. More recently, it has been the suspected source of sliding rocks and material due to heavy rains washing through the open area.

Channelization has occurred on the Loyalhanna Creek main stem as it flows through the gorge closer to Latrobe. The streambank has been reinforced with concrete to allow for the safe passage of motorists along Route 30. There are also several locations were homeowners have established walls constructed of various materials to protect their homes from high-flowing water.

When the Loyalhanna Creek main stem exits the gorge, it slows prior to spilling over the Kingston Dam. Approximately 1,000 feet upstream of the dam, the slowing water spreads out and sediment is given the opportunity to settle onto the stream bottom.

The Kingston Dam serves as a very large barrier to the movement of fish. Low flow situations would make it nearly impossible for fish to move up or downstream over the dam. In higher flow situations, fish may be able to move downstream, but going upstream would be extremely difficult.

Miller Run, a small tributary, enters the Loyalhanna Creek main stem directly at the dam site. The mouth of the tributary is choked with Japanese knotweed and large amounts of sediment. This is the first large concentration of Japanese knotweed that appears in this section of the Loyalhanna Creek.

Downstream of the dam, the active channel width of the Loyalhanna Creek expands to approximately 120 feet and the creek flows through a flat landscape scattered with sycamore trees and low-lying vegetation. As it breaks away from the Route 30 corridor to turn northward, Japanese knotweed and multiflora rose are visible along the banks in many locations. They are most prevalent where disturbance has occurred from past industry, electrical line installation, and flooding. The stream substrate is dominated by cobble with occasional deposits of silt and mud. Braiding of the stream is evident in a few locations where sediment islands have formed in the middle of the stream channel. Homes close to the streambank have installed various forms of stabilization to protect from high water flow.

Upon passing underneath the Route 982 Bridge, the characteristics of the Loyalhanna Creek begin to change drastically. **Ninemile Run**, a large tributary, enters from the south, carrying large amounts of sediment. Despite known sources of AMD upstream in the town of Baggaley, no impact is apparent at the mouth of the stream. The Ninemile Run AMD source seeps from the buried remains of a huge refuse pile that was removed from the area in the late 1980s. After its confluence with Ninemile Run, the substrate of the Loyalhanna Creek main stem is cobble, but shows increased embeddedness as sand and mud settle due to slower flowing water. As the Loyalhanna Creek flows closer to downtown Latrobe, industry, old industrial sites, and scattered residences begin to dominate the land surrounding the

creek. During the assessment, an alkaline discharge was discovered streamside. It was suspected that the discharge originated from a source of waste tailings from historic steel production in this section.

Approximately one mile downstream from Ninemile Run, the Loyalhanna Creek flows around an oxbow formation. As the creek rounds the oxbow, numerous homes and businesses are quickly visible from the streambank. Additionally, the first visible signs of AMD trickle into the main stem from the Latrobe Discharge. The source of the Latrobe Discharge is located on the land that creates the oxbow. The discharge enters the creek from the south bank, directly across from the power transfer station along the walking trail at Legion Keener Park. (Refer to Appendix 3 for location and water quality information).

Just downstream, across from the main section of Legion Keener Park, **Monastery Run** enters the Loyalhanna Creek. Passive treatment systems located at Saint Vincent College have improved the water quality of Monastery Run and the Loyalhanna Creek main stem significantly since their installation in 1997 and 1998. Despite this treatment system, Monastery Run continues to contribute visible iron oxide loading to the main stem during the winter and spring.

LWA staff member shown at the site of Adelphoi Borehole. As of fall 2004, it was plugged with gravel and debris from flooding

Five hundred feet downstream of the Loyalhanna Creek confluence with Monastery Run, two discharges each contribute 130-150 gpm into the Loyalhanna Creek. The first is a borehole drilled into the middle of the stream. The borehole, referred to as the Adelphoi Borehole, was drilled in order to relieve basement flooding in nearby homes in the 1950s or 1960s. As of late fall 2004, the borehole was plugged with gravel, cobble, and various debris from flooding. As a result of the borehole and other discharges, iron staining is visible along the Loyalhanna Creek streambanks and substrate. The second discharge, known as the Adelphoi Pipe, flows from the bank directly above the borehole. Both discharges are located directly behind the Adelphoi Village school complex. Flowing from a large storm drain, one more discharge enters the stream 500 feet from the two Adelphoi discharge locations. Its source is the Latrobe Mine and Coke Works in Lloydsville. Because it flows into the contained drainage system along Unity Street, it is referred to as the Unity Discharge. The four previously mentioned discharges are all sampled quarterly by the LWA. Because they were previously known discharges, no further investigation was made during the assessment. Currently, LWA is carrying out a project that will possibly seal or scale back three of the four discharges. Water chemistry for all sampled discharges in the Loyalhanna Creek Watershed can be viewed in Appendix 3.

Looking downstream at Latrobe from the location of the Adelphoi Borehole and Adelphoi Pipe discharges

Through the most populated area of Latrobe, the stream substrate and banks are lined with gravel and rock. The main stem was stabilized and channelized in order to move high water flows quickly through the downtown area. The stream substrate is a mix of sand, gravel, iron precipitate, and mud. Passing underneath the Route 981 Bridge, the Loyalhanna is visibly stained and its banks are devoid of vegetation or canopy cover. Homes and businesses lining the streambanks offer the only shade for the stream.

After passing underneath the Route 981 Bridge,

the Loyalhanna Creek continues to wind its way through downtown Latrobe, with residences lining both sides of the stream. Various stormwater drains enter from both streambanks and vegetation is minimal. It passes underneath the Ligonier Street Bridge after flowing by the Latrobe Brewing Company and Latrobe Area Hospital. The final stretch of the middle section experiences a minimal recovery of streamside vegetation in the form of Japanese knotweed, shrubs, and small trees. The middle section of the Loyalhanna Creek finally comes to a close with the addition of flow from **Saxman Run**.

Saxman Run, heavily impacted by AMD, enters the Loyalhanna Creek at the site of the Latrobe Sewage Treatment Plant. A plume of orange water from Saxman Run mixes with the Loyalhanna Creek main stem, changing its character prior to the completion of the middle section.

Unnamed Tributaries to the Middle Loyalhanna Creek Subwatershed

Ten unnamed tributaries enter the middle section of the Loyalhanna Creek main stem. Those close to the beginning of the middle section were rated moderately, with impacts similar to those in the upper section of the subwatershed. Those impacts include riparian vegetation degradation and sedimentation due to erosion. Closer to Latrobe, at the end of the middle section, the tributaries experience impacts related to population and industry increases in the area, such as trash and road runoff.

In Ligonier Township, two small tributaries enter the Loyalhanna Creek main stem from the north, UNT4N and UNT5N. The first, UNT5N, flows parallel to Orme Road. It enters the Loyalhanna Creek just downstream of the intersection of Route 259 and Route 30. The stream channel has been altered in multiple places by landowners, creating a series of eroding areas throughout its length. The second tributary, UNT4N, flows parallel to Clark Hollow Road and has similar issues. Many landowners have altered the channel and erosion is occurring along several stream sections. In addition, UNT4NA was noted for the presence of AMD. An abandoned drift mine exists on the roadside and still has mine structures visible. Water flowing from a mine entry has a pH of 4.1 and visible white staining from precipitating aluminum. Below the entrance of the discharge, pH readings were between 6.0 and 7.0. UNT4N flows into the Loyalhanna Creek main stem directly in the middle of Idlewild Park.

Four separate unnamed tributaries enter the Loyalhanna Creek in the Loyalhanna Gorge. Each of them was rated similarly and all of them originate in steep, forested areas that are part of the Chestnut Ridge. Large boulders and cobble dominate the substrates of the tributaries, all of which received good overall ratings during the assessment.

The remaining unnamed tributaries enter the Loyalhanna Creek from areas in Latrobe. The most heavily impacted of those tributaries is Unity Run, originating above the small town of Lloydsville, located just west of the City of Latrobe. Its headwaters are heavily eroded, primarily due to the lack of significant streamside vegetation. After flowing through the north side of Lloydsville, the stream is channeled underneath the major railroad line traveling northeast through Latrobe. After passing under the railroad, the stream is then buried underground to bypass homes, streets, and businesses. In addition, a discharge enters the drainpipe contributing iron-laden water to the overall flow of Unity Run. Unity Run finally meets the Loyalhanna Creek across from the main section of Legion Keener Park. The discharge is currently sampled quarterly by the LWA.

Water Quality

Two main stem samples were taken along the Middle Loyalhanna Creek main stem. The sites were selected utilizing knowledge of the landscape, accessibility, known impacts, and major tributary location. Table 2.A.1 and Table 2.A.2 show water quality data. The water quality results for the sampled sites show no significant impacts. Both sites are located above AMD impacts and therefore did not show high levels of iron. Samples taken further downstream will show the overall impact from mine drainage entering the Loyalhanna Creek in Latrobe.

Table 2.A.1: Sample Site LWA-D Darlington Road Bridge					
Date Sampled	**pH**	**Alk. (mg/L)**	**TSS (mg/L)**	**TDS (mg/L)**	**Iron (mg/L)**
5/25/04	6.9	20	6	82	<0.06
8/25/04	6.93	36	4	104	<0.06
10/25/04	7.04	45	<1.0	138	0.2

Sample Location: LWA-D is sampled at the Darlington Road Bridge. The sample site can be accessed from Route 30 West by turning left onto Darlington Road. The bridge is located 1,000 feet from the Route 30 intersection.

Table 2.A.2: Sample Site LWA-E Kingston Dam – Route 217 Bridge					
Date Sampled	**pH**	**Alk. (mg/L)**	**TSS (mg/L)**	**TDS (mg/L)**	**Iron (mg/L)**
5/25/04	6.90	10	7	78	<0.06
8/25/04	7.24	37	4	104	<0.06
10/25/04	7.20	50	1	139	<0.07

Sample Location: LWA-E is sampled from the Route 217 Bridge over the Loyalhanna Creek at the Kingston Dam. The sample site can be accessed by parking at the intersection of Route 30 and Route 217 and walking to the bridge.

Conclusions

The Middle Loyalhanna Creek Subwatershed received an overall score of 6.6, which is a fair rating. The fair rating can be attributed to the impacts of erosion, channelization, and degradation of riparian zone vegetation. In addition, the middle section includes the impact of AMD as it flows through Latrobe. In the City of Latrobe, four abandoned mine discharges directly enter the main stem. Two major tributaries–Saxman Run and Monastery Run–also contribute AMD impacts to the main stem.

The Adelphoi Pipe, Adelphoi Borehole, Latrobe Discharge, and Unity Discharge are the four main stem discharges that contribute as much as 500-700 gpm of flow. Monastery Run, a large tributary to the Loyalhanna Creek main stem, contains some AMD. Treatment systems upstream remove a large majority of that AMD from the stream, but due to seeps, occasional system overflows, and residual iron oxide sediment, some AMD still enters the Loyalhanna Creek main stem. Monastery Run flows into the Loyalhanna Creek within the stretch adjacent to Legion Keener Park. Finally, the Saxman Run subwatershed, the last to enter the Loyalhanna Creek within the middle section, contributes a large amount of AMD. With three large discharges located along its entire length, this stream is composed primarily of water flowing from abandoned mines.

In addition to the impacts from AMD, the population increase surrounding the Loyalhanna Creek as it flows through the City of Latrobe has an impact. That impact varies from the presence and/or past presence of industry creating pollution problems, to the concentration of residences found where forests and fields once existed. Community members need to be made aware of simple steps that can be taken to lessen their impact upon the Loyalhanna Creek as it flows through populated downtown Latrobe.

There was a decrease in the overall visual assessment rating between the upper and middle subwatershed. That decrease was expected due to known pollution problems in and around Latrobe. The middle section of the subwatershed is where a large transition in overall water quality occurs. This overall change primarily is due to the increased presence of AMD impacts. The remediation of known and new AMD impacts in the Middle Loyalhanna Creek Subwatershed should be a top priority for conservation organizations.

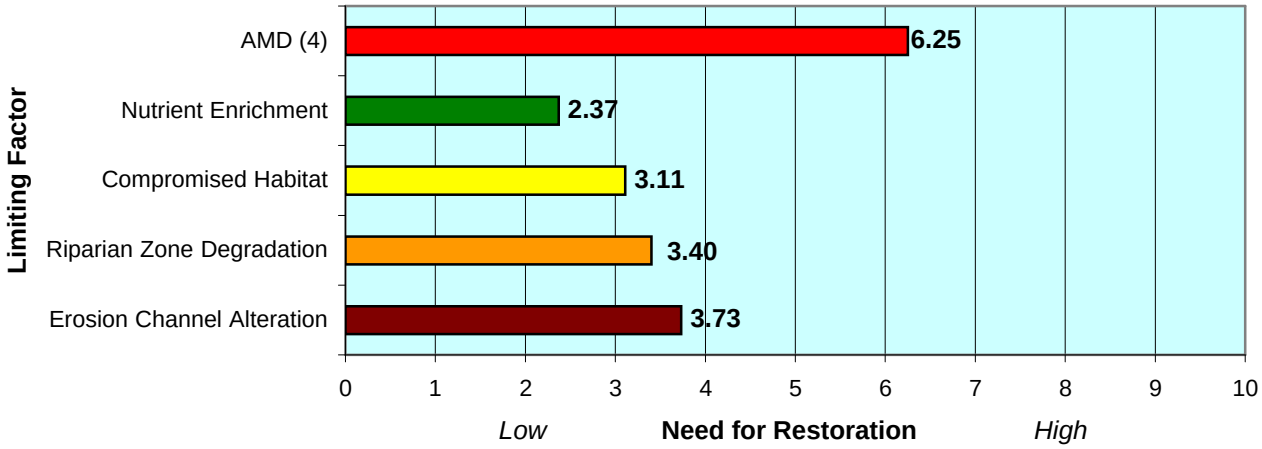
Recommendations

- Determine the feasibility for remediation of all known abandoned mine discharges located within the Middle Loyalhanna Creek Subwatershed section. Upon determination of feasibility, proceed to treatment, concentrating efforts in the heart of Latrobe.
- Provide information to the community that will facilitate an increased awareness of subwatershed issues and their role in the protection of the subwatershed.
- Work with Unity Township and the City of Latrobe to address erosion issues and degraded riparian zones throughout the entire subwatershed.
- Continue to work with townships, and local businesses to increase community involvement in conservation organizations.
- Encourage installation of sewerage in communities where it is currently not available.

Overall Restoration Priorities

Figure 2.A.2 exhibits the restoration priorities for the Middle Loyalhanna Creek main stem and its unnamed tributaries. As indicated, AMD and erosion and channel alteration received the highest restoration priority. Four assessed stream sections contained impacts from AMD–MidLoyG, MidLoyF, UNT4NA, and UnityA. Those stream segments received an average score of 3.75. To learn more about the four stream segments, refer to Table 2.A.3.

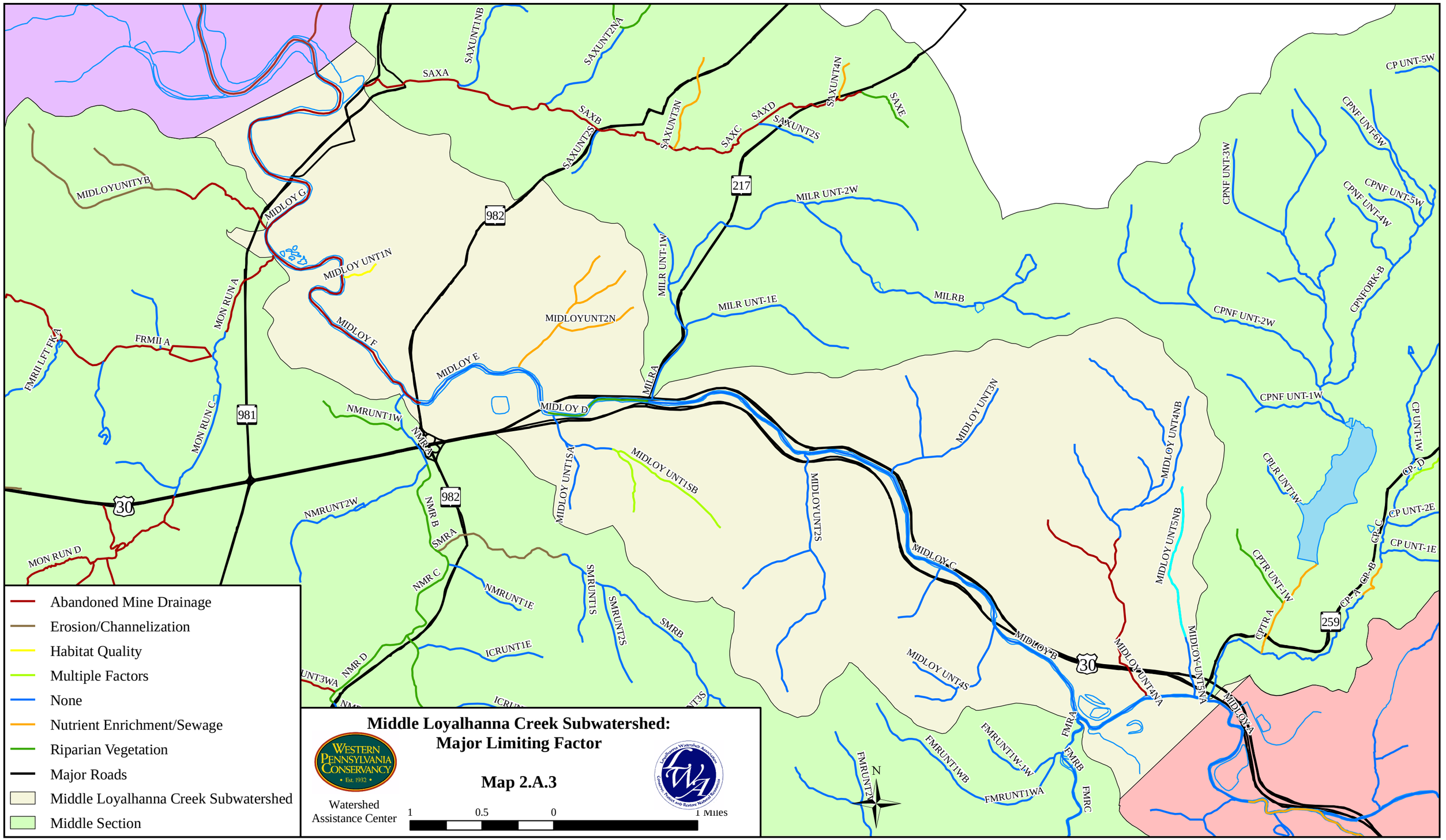
Figure 2.A.2: Overall Restoration Priorities for the Middle Loyalhanna Creek Subwatershed



Restoration Suggestions for Individual Stream Segments

Ten stream sections received scores identifying limiting factors. The limiting factors identified were erosion and channel alteration, compromised fish and macroinvertebrate habitat, riparian vegetation degradation, nutrient loading and AMD. Please refer to Table 2.A.3 and Map 2.A.3 for impact description and segment locations.

Table 2.A.3: Impacted Stream Segments and Restoration Suggestions for the Middle Loyalhanna Creek Subwatershed				
LIMITING FACTOR: Riparian Vegetation Degradation				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
MIDLOYD *Main stem section that extends from the Kingston Dam to the next bridge over the Loyalhanna before the BP gas station. The section flows through a flat area with very little vegetation, residences, or businesses.*	Canopy cover and riparian zone vegetation are limited. Natural vegetation extends only one-third of the active channel width on both sides of the creek. Vegetation is comprised of very few trees and extensive Japanese knotweed.	1. Investigate land ownership and work with landowner to encourage riparian remediation. Possible Partners: Unity Township, Derry Township, WCD, USACE	State, Federal, Local, Private	Low
MIDLOYF *Main stem section extending from the Route 982 Bridge to just before the outskirts of downtown Latrobe. The section flows through a mixed area with industry, residences, and business.*	Canopy cover and riparian vegetation are extremely minimal on one side of the stream. The other side has mediocre coverage; however, more would be desirable.	1. Investigate land ownership and work with the landowner to encourage riparian remediation. Possible Partners: Unity Township, WCD, USACE, Latrobe Foundation	State, Federal, Local, Private	Low
MIDLOYG *Main stem section that extends from Legion Keener Park in downtown Latrobe to the completion of the middle main stem section. It is surrounded by an urban landscape consisting of homes, industry, roads, and businesses.*	A concrete-lined channel through downtown Latrobe allows for no riparian vegetation for a majority of the section. Vegetation does recover further downstream, but the recovery is minimal.	1. Work with the USACE to determine a course of action that would allow for the remediation of riparian vegetation to creek banks. Possible Partners: Unity Township, City of Latrobe, USACE, WCD	State, Federal, Local	Medium


SAXA
SAXUNT1NB
SAXUNT2NA
SAXB
SAXUNT2S
SAXUNT3N
SAXC
SAXD
SAXUNT2S
SAXUNT4N
SAXE
MIDLOYUNITYB
MIDLOY G
MIDLOY UNT1N
MIDLOY F
MIDLOY E
MIDLOYUNT2N
MON RUN A
FRMII A
FMRII LFT FK A
MON RUN C
MON RUN D
NMRUNT1W
NMRUNT2W
NMR B
NMR C
NMR D
SMRA
NMRUNT1E
SMRUNT1S
SMRUNT2S
SMRB
ICRUNT1E
MILR UNT-2W
MILR UNT-1W
MILR UNT-1E
MILRB
MILRA
MIDLOY D
MIDLOY UNT1SA
MIDLOY UNT1SB
MIDLOYUNT2S
MIDLOY C
MIDLOY UNT3N
MIDLOY UNT4S
MIDLOY B
MIDLOY UNT4NB
MIDLOY UNT5NB
MIDLOY UNT4NA
MIDLOY-UNT5NA
MIDLOY A
FMRUNT2A
FMRUNT1WB
FMRUNT1W-1W
FMRUNT1WA
FMRA
FMRB
FMRC
CP UNT-5W
CPNF UNT-6W
CPNF UNT-3W
CPNF UNT-5W
CPNF UNT-4W
CPNFORK-B
CPNF UNT-2W
CPNF UNT-1W
CP UNT-1W
CP-D
CP UNT-2E
CP-C
CP-B
CP UNT-1E
CP-A
CPLR UNT1W
CPTR UNT-1W
CPTR A
217
982
981
30
259
Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Middle Loyalhanna Creek Subwatershed
Middle Section
Middle Loyalhanna Creek Subwatershed:
Major Limiting Factor
Map 2.A.3
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
1 0.5 0 1 Miles
N

MIDLOYUNT1N *Very small intermittent tributary that enters the Loyalhanna between Grant St. and Monroe St. in downtown Latrobe. The stream is surrounded entirely by residences and streets.*	The stream has very little vegetation surrounding its banks. Few trees are located streamside. Where lawns exist, they are mowed directly to the bank and, otherwise, streets and buildings directly abut the streambank.	1. Work with landowners and the City of the Latrobe to encourage riparian vegetation re-growth along the tributary. Possible Partners: City of Latrobe, WCD	Federal, State, Private, Local	Low
MIDLOYUNT1SB *Small, channelized stream that disappears into storm drainage systems in Edgewater Terrace, just north of Youngstown.*	The stream is channelized and, therefore, has no riparian zone.	1. Determine reasons for channelization. Possible Partners: Unity Township	Local	Low
MIDLOYUNT5NB *Small tributary that flows parallel to Orme Road in Ligonier. The stream is flanked by homes for a majority of its length.*	Moderate riparian vegetation exists along streambanks. On many occasions, homeowners are mowing lawns directly to streambanks. The stream's canopy cover is also minimal due to the removal of trees along the streambank.	1. Work with landowners to encourage remediation of riparian vegetation and canopy cover. Possible Partners: WCD, Ligonier Township	State, Local, Private	Low – Medium
LIMITING FACTOR: Compromised Fish and Macroinvertebrate Habitat				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
UNITYA *Section of a small tributary, Unity Run, that is partially channelized as it flows through downtown Latrobe into the Loyalhanna. It passes around and underneath various buildings, industry, and homes.*	The channel that Unity Run travels through is the storm drain system for the city. It has a concrete substrate absent of fish habitat and food source. In addition, the channel serves as a barrier to any fish movement up or downstream.	1. Determine need for channelization. Possible Partners: City of Latrobe	Local	Low

MIDLOYUNT1N *Very small intermittent tributary that enters the Loyalhanna between Grant St. and Monroe St. in downtown Latrobe. The stream is surrounded entirely by residences and streets.*	Due to lack of riparian vegetation, food sources for stream life are limited. In addition, the stream substrate is littered with trash from surrounding homes. The stream substrate is composed primarily of silt and mud, therefore eliminating valuable habitat.	1. Work with landowners and the City of Latrobe to remediation vegetation and investigate source of silt and mud. 2. Educate streamside dwellers about the potential value of the stream flowing through their backyard. Possible Partners: City of Latrobe, WCD	Local, State	Low
MIDLOYUNT1SB *Small, channelized stream that disappears into storm drainage systems in Edgewater Terrace, just north of Youngwood.*	Channelization of the stream creates many challenges for stream life. The substrate of the stream is concrete. Food sources are limited as the stream is channelized underground.	1. Determine reasons for channelization. Possible Partners: Unity Township	Local	Low
LIMITING FACTOR: Nutrient Enrichment				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
MIDLOYUNT2N *Small tributary that runs through a small strip of trees in the middle of a field.*	A lot of algae growth was visible along the stream substrate. No grazing cows indicated the source would have been something other than agricultural.	1. Determine source of nutrient loading. 2. Work with the landowner to remove nutrient source. Possible Partners: WCD, WPC, NRCS	Federal, State, Private	Low
LIMITING FACTOR: Erosion and Channel Alteration				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
MIDLOYD *Main stem section that extends from the Kingston Dam to the next bridge before the BP gas station. Section flows through a flat area with little vegetation, residences, or businesses.*	Channel alteration occurs at the site of the Kingston Dam and multiple bridges throughout. Sediment coats rocks and substrate is 30% to 40% embedded. Major area of erosion occurs at Shelving Rocks Bridge.	1. Work with township and PennDOT to investigate channelization of creek. 2. Work with landowner at Shelving Rock Bridge to address eroding area. Possible Partners: PennDOT, Unity Township, PAFBC, WCD	Federal, State, Local	Low – Medium

MIDLOYF *Main stem section extending from the Route 982 Bridge to just before the outskirts of downtown Latrobe. The section flows through a mixed area with industry, residences, and business.*	Channel has been altered in several sections to accommodate for flooding. The bank is moderately stable, although water is very slow moving. The slow-moving water is able to dump large amounts of sediment; thus the substrate is 40% embedded.	1. Address upstream source of sediment in order to eliminate embeddedness throughout section. 2. Work with Township and PennDOT to investigate alteration of stream channel and banks. Possible Partners: PennDOT, Unity Township, PAFBC, WCD	Federal, State, Local	Low – Medium
MIDLOYUNT1N *Very small intermittent tributary that enters the Loyalhanna between Grant St. and Monroe St. in downtown Latrobe. The stream is surrounded entirely by residences and streets.*	Channel has been altered to move the stream through downtown area. Stream substrate is embedded more than 40%. Source of mud, silt, and sediment is most likely runoff from roads, driveways, and yards.	1. Work with City of Latrobe to improve stream channel, riparian area, and banks. 2. Educate landowners and encourage actions that will eliminate sediment source entering the stream. Possible Partners: City of Latrobe, Unity Township	State, Local	Low
MIDLOYUNT1SB *Small, channelized stream that disappears into storm drainage systems in Edgewater Terrace, just north of Youngwood*	The stream is entirely channelized as it flows. Its headwater point was not found during fieldwork. The only evidence of its presence was a series of storm drains where it should have been flowing.	1. Determine reason for channelization. Possible Partners: Unity Township	Local	Low
MIDLOYUNT5NB *Small tributary that flows parallel to Orme Road in Ligonier. The stream is flanked by homes for a majority of its length.*	The stream flows through a series of bridges, culverts, and areas that have been channelized to protect driveways, yards, etc. In many places, banks have been stabilized with various materials including riprap, tires, etc.	1. Work with Township and PennDOT to investigate channel alteration. 2. Educate landowners and encourage them to investigate alternate methods of protecting streambanks, driveways, and yards. Possible Partners: Ligonier Township, PAFBC, PennDOT	Federal, State, Local, Private	Low – Medium

UNITYA *Section of a small tributary, Unity Run that is partially channelized as it flows through downtown Latrobe into the Loyalhanna. It passes around and underneath various buildings, industry, and homes.*	Stream section is channelized for a majority of its journey toward the Loyalhanna main stem.	1. Determine reason for channelization. Possible Partners: City of Latrobe, Unity Township	Local	Low
UNITYB *Headwater section of a small tributary that drains a hillside above the small town of Lloydsville.*	Stream is channelized through residential areas at bridges and along roads. Eroding streambanks contribute considerable amounts of sediment to the stream, creating significant embeddedness.	1. Work with landowners to remediate erosion and channelization of the stream. Possible Partners: Unity Township, WCD	Local, State	Low
LIMITING FACTOR: Abandoned Mine Drainage				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
MIDLOYF *Main stem section extending from the Route 982 Bridge to just before the outskirts of downtown Latrobe. The section flows through a mixed area with industry, residences, and business.*	Drainage from tailings piles located along the side of the stream. Small seeps enter the stream; no significant flow found.	1. Investigate what is known about the tailings– how much is there and what they are composed of. 2. Plan for removal, if feasible. Possible Partners: City of Latrobe, Local Industry, State	State, Local, Federal	Low – Medium

MIDLOYG *Main stem section that extends from Legion Keener Park in downtown Latrobe to the completion of the middle main stem section. It is surrounded by an urban landscape consisting of homes, industry, roads, and businesses.*	Multiple discharges enter the stream section, each containing a pH level close to 6.5 and high levels of iron. Iron staining is especially visible from Monastery Run entering the main stem. The discharges are: Adelphoi Borehole, Adelphoi Pipe, Latrobe Discharge, and Unity Discharge.	1. Continue to work with regional conservation organizations to remediate discharges within the section. 2. Work with SVC to take the steps necessary to ensure the continued effective operation of the Monastery Run Passive Treatment System. Possible Partners: State, SVC, WCD, WPCAMR, WPC	Growing Greener, OSM, EPA, Private	Medium – High *(Due to size of source)*
MIDLOYUNT4NA *Small tributary that flows parallel to Clark Hollow Road in Ligonier. The stream winds through a hollow that drains the east side of Chestnut Ridge. Scattered residences surround the stream.*	An old deep/drift mine opening was found that is still intact and visible from the road. Several outbuildings are also still standing. DEP has continually investigated the site and information about it is available in historic information. The pH of water flowing out of the mine was 3.9.	1. Support DEP in its efforts to close off, seal, and remediate the abandoned site for safety purposes. Possible Partners: DEP	State, Local	Medium
UNITYA *Section of a small tributary, Unity Run, that is partially channelized as it flows through downtown Latrobe into the Loyalhanna. It passes around and underneath various buildings, industry and homes.*	A discharge enters Unity Run directly after it crosses underneath the railroad tracks in downtown Latrobe. Currently, the discharge flows out of an 8-inch pipe into the storm drain that carries Unity Run to meet the Loyalhanna. Its pH was 6.5 in the field.	1. Locate source of discharge. 2. Develop plans for treatment. Possible Partners: Latrobe Historical Society, City of Latrobe, SVC, DEP, USACE, WCD	State, Federal, Local, Private	Medium – High

SECTION 2.B
COALPIT RUN

Section 2.B

Coalpit Run Subwatershed

General Description

The Coalpit Run Subwatershed drains the western slope of Chestnut Ridge. A majority of its tributaries emerge from steep, forested hollows to enter the main stem flowing south toward the Loyalhanna. The watershed is located in the northwest corner of Ligonier Township north of Route 30 and west of Route 259. Its 12.47 square miles are comprised primarily of forested areas and scattered homesteads.

Looking upstream at Coalpit Run from the bridge on Route 30 West

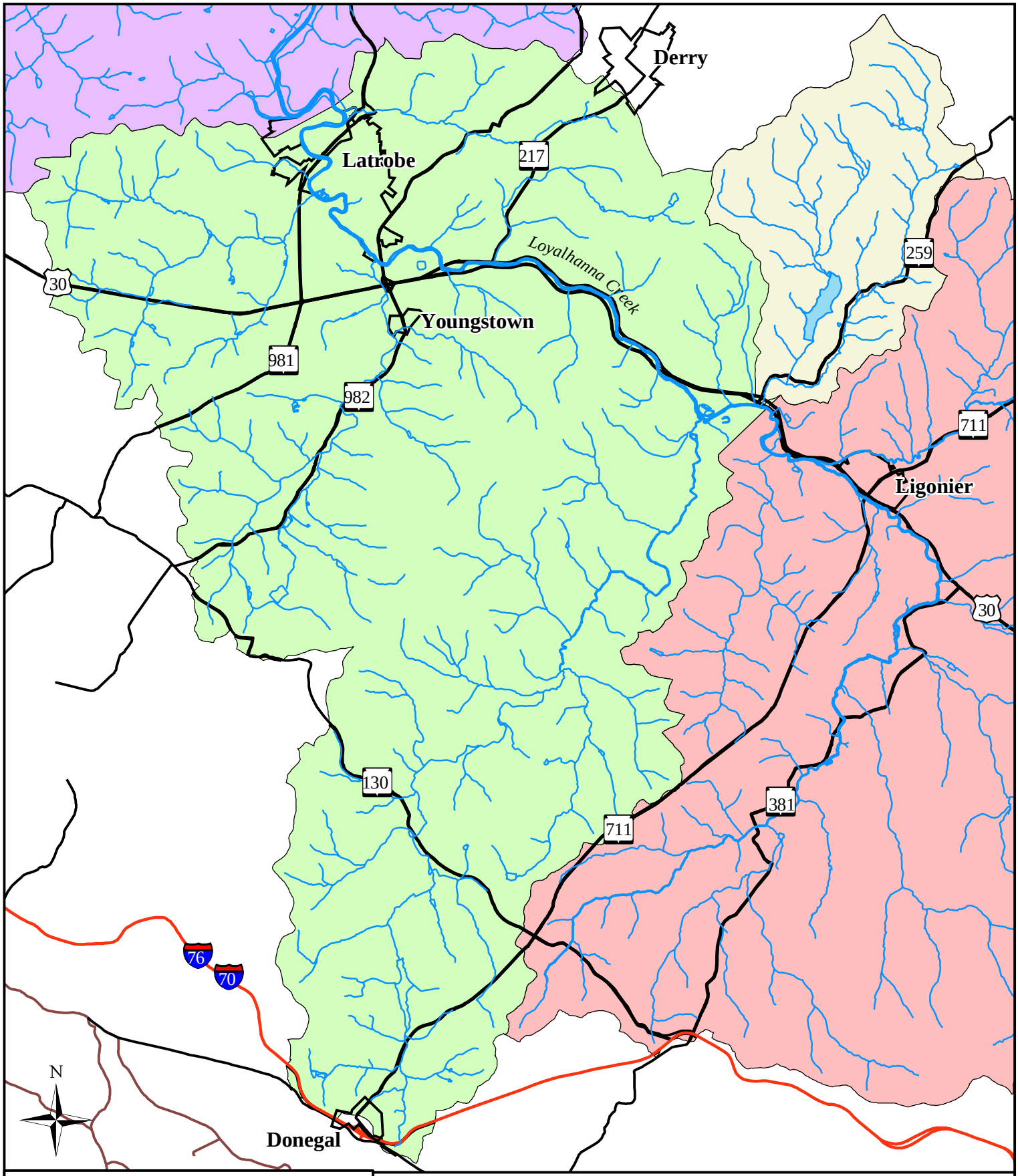
Coalpit Run consists of two major branches that flow parallel to each other—the main branch and North Branch. The main branch of Coalpit Run follows Route 259 North and collects flow from 11 tributaries entering from the east and west. The headwaters of the main branch of Coalpit Run flow from a limestone rock formation found in a steep hollow just below the Chestnut Ridge radio tower. From that point, the main branch continues to drop through a steep, heavily forested area as it moves south. Halfway through its journey, a tributary enters from the north where McCurdy Trail Road crosses over the stream. It is at this point that the elevation flattens and the landscape surrounding the main branch changes. Thick forest gives way to areas filled with shrubs, multiflora rose, small trees, and occasional open fields. After passing through a small dairy farm, the stream retreats into a forested area once again. It remains mostly forested until it meets the North Branch at the intersection of Route 259 and Clark Hollow Road.

The second of the two major branches of Coalpit Run also originates high upon Chestnut Ridge. Its headwaters consist of a series of spring source tributaries that drain Bergstrom Hollow, Detling Hollow, and Dark Hollow. Together they join to form the North Branch. Collectively, seven tributaries and the main stem of the North Branch feed the Latrobe Reservoir, Latrobe's water supply. The landscape drained by North Branch is almost entirely forested, with the exception of a portion of the main stem itself. Prior to flowing into the reservoir, the North Branch passes through a farming operation where streambank fencing has been installed. During this section of its journey, open fields surround the stream for approximately one-half mile.

Built in 1919, the Latrobe Reservoir is fed by the North Branch. It is one mile long and surrounded by a thick forest buffer. At the spillway, the stream created by overflowing water is named Trout Run. Trout Run is a very short section of stream that flows to meet the Coalpit Run main stem.

Where the two branches come together, Coalpit Run remains surrounded by forest, with a few residences scattered along its banks. Not until reaching Route 30, does Coalpit Run emerge from the forested landscape. At this point, Coalpit Run flows underneath the highway and quickly meets the Loyalhanna Creek main stem.

Coalpit Run is classified as a CWF. For geographic location of this subwatershed, please refer to Map 2.B.1.



Coalpit Run Subwatershed: Overall Location

Map 2.B.1

Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center

1 0.5 0 1 Miles

Loyalhanna Watershed Association
Conserve, Protect and Restore Natural Resources

Review of Historic Information

Very little historic data was located for the Coalpit Run subwatershed. In general, it experiences very few impacts and therefore has not required significant study by any local, state, or federal organization. The information listed below can be found in more complete form at the LWA office.

Latrobe Area Historical Society

The Latrobe Reservoir collects its water from the North Branch portion of the Coalpit Run Watershed. Water from the reservoir is collected and piped to the Kingston Dam, pumped up to a filtration plant above the Kingston Dam, and sent to Latrobe water customers. When first constructed in 1919, the piping system was wooden and leaked profusely. Today, the piping is buried underground and suffers very little water loss. The Latrobe Reservoir is not open to the public and is a popular area for geese, ducks, and other migratory birds to visit. One osprey nest has been constructed on its northwest side and is often occupied by osprey.

Loyalhanna Watershed Association

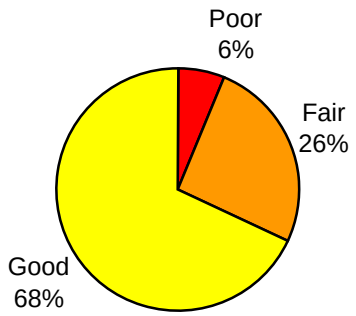
In 2003-2004, the LWA completed a macroinvertebrate survey at two sites along the main branch of Coalpit Run. The data collected showed good diversity and good numbers of macroinvertebrates. This data helps to confirm the findings of the visual assessment. Because collection only occurred for one year, no other conclusions can be made utilizing the existing data.

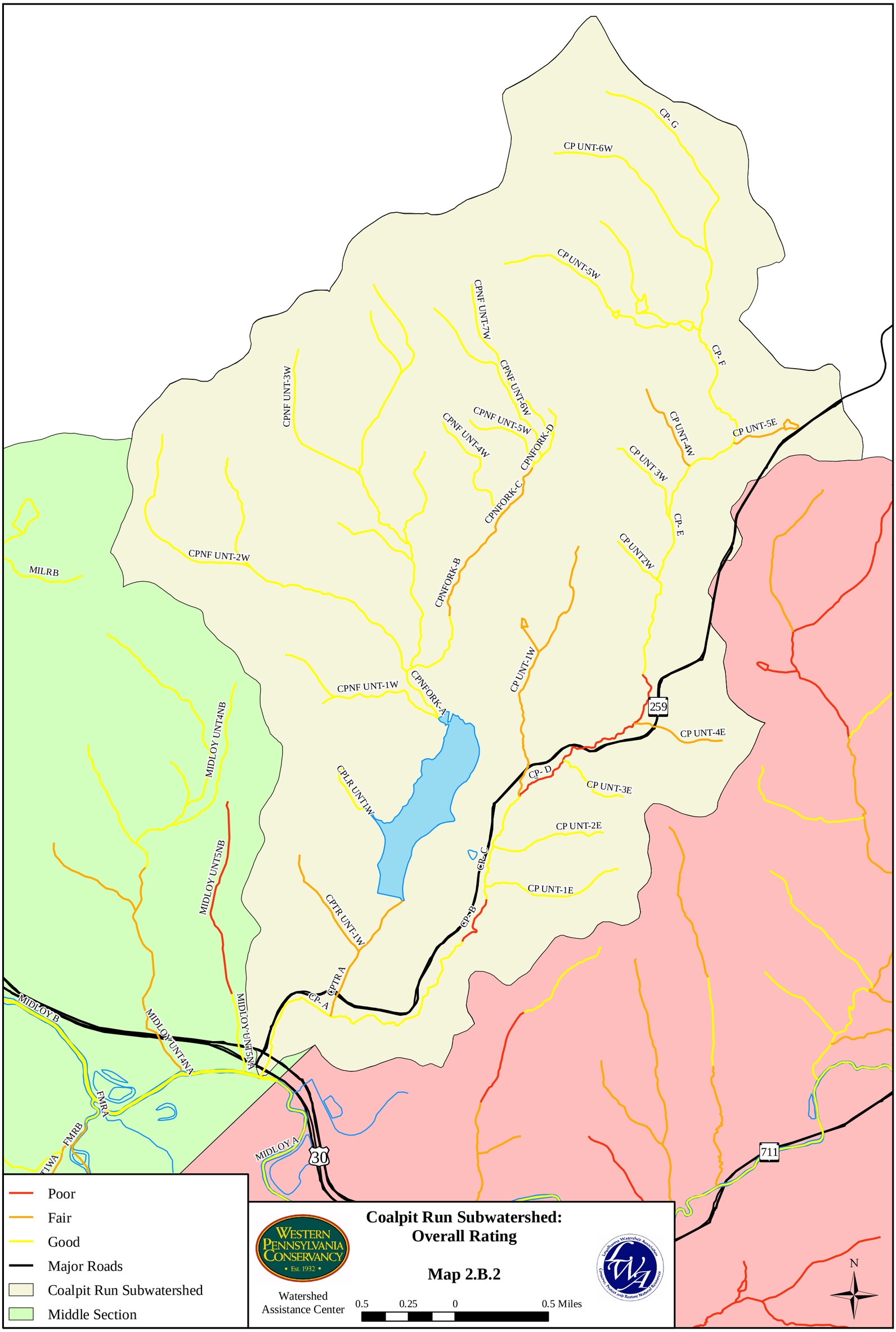
Visual Assessment Summary

Visual Assessment Findings

The visual assessment of the Coalpit Run Subwatershed was completed in the late fall of 2003. A small amount of snow blanketed the ground during multiple field days. A total of 31 stream sections were assessed. As depicted in Figure 2.B.1, 68% of the watershed received a good rating, 26% received a fair rating, and 6% received a poor rating. An average score of 7.78 was given to the entire watershed. This is a good rating overall. That rating reflects the overall quality of the watershed. The overall good rating is due primarily to the high quality riparian zone and canopy cover surrounding the stream. Individual stream ratings are depicted in Map 2.B.2.

Figure 2.B.1: Visual Assessment Ratings for the Coalpit Run Subwatershed




CP- G
CP UNT-6W
CP UNT-5W
CPNF UNT-7W
CPNF UNT-6W
CP- F
CPNF UNT-3W
CPNF UNT-5W
CPNF UNT-4W
CPNFORK-D
CP UNT-4W
CP UNT-5E
CP UNT-3W
CPNFORK-C
CP- E
CP UNT2W
CPNF UNT-2W
MILRB
CPNFORK-B
CPNF UNT-1W
CPNFORK-A
CP UNT-1W
259
CP UNT-4E
MIDLOY UNT4NB
CP- D
CP UNT-3E
CPLR UNT1W
CP UNT-2E
MIDLOY UNT5NB
CP-C
CP UNT-1E
CPTR UNT-1W
CP-B
CPTR A
CP- A
MIDLOY B
MIDLOY UNT4NA
MIDLOY UNT5NA
FMRA
FMRB
MIDLOY A
30
711
Poor
Fair
Good
Major Roads
Coalpit Run Subwatershed
Middle Section
Coalpit Run Subwatershed:
Overall Rating
Map 2.B.2
Western Pennsylvania Conservancy
Est. 1932
Watershed
Assistance Center
0.5 0.25 0 0.5 Miles
N

Visual Assessment Description

Coalpit Run Main Branch

The main branch of Coalpit Run flows east from Chestnut Ridge through a very steep forested hollow comprised of mostly pine and oak. Boulders and cobble dominate the main stem and the multiple tributaries that join it. Only one tributary, UNT5E, experiences a major impact. High, eroding banks dominate the tributary and it is suspected that this erosion is caused by runoff from Route 259 at the tributary headwaters.

Approximately halfway through its entire reach, Coalpit Run begins to follow Route 259. Not until this point does the landscape surrounding the stream change significantly. The forest becomes less dense and is dominated by fewer deciduous trees and more shrubs. Cobble and gravel dominate the substrate and increased amounts of sediment are noticeable. It is in this area that UNT4E enters the main stem. This tributary is choked with sediment and gravel at and near the mouth. UNT4E flows adjacent to a road for sometime, following a dirt channel. Heavy amounts of sediment are carried by this tributary and deposited at its mouth. A majority of the sediment seems to be deposited before entering the main branch of Coalpit Run. Because most of the sediment is dumped in the mouth of the tributary, very little is carried downstream into Coalpit Run.

As Coalpit Run passes by the intersection of Route 259 and McCurdy Trail Road, it continues to maintain a vegetative buffer thick with shrubs and trees. It does so until reaching a dairy farm approximately one mile downstream from McCurdy Trail Road. It is in this section of stream, labeled segment CPB, that cows have direct access to Coalpit Run. In addition, the farmyard is sloped toward the stream. Therefore, during heavy rains, any farmyard runoff is washed immediately into the stream. Very little riparian vegetation is present in this section and the streambanks are severely eroded. Silt and mud dominate the substrate of Coalpit Run as it passes through the farm. That substrate condition continues downstream beyond the impacted area. As Coalpit Run flows away from the agricultural impact, it retreats again into a forested area. Close to the mouth of the stream, the North Branch flows into the main stem. Coalpit Run remains forested as it flows adjacent to Route 259. This forested buffer remains until Coalpit Run reaches the intersection of Route 259 and Route 30. It is at this point that paved roads replace the forested buffer. Coalpit Run flows into the Loyalhanna Creek main stem just after passing underneath Route 30.

North Branch and Trout Run

Similar to the main branch of Coalpit Run, the North Branch originates high upon Chestnut Ridge. The main stem of the North Branch travels south collecting flow from multiple tributaries entering from the west. All of the tributaries originate from steep areas upon the ridge. Heavily forested land surrounds each of the tributaries that contain substrates dominated by large boulders and cobble. No significant impacts were noted on any of the tributaries.

The main stem of the North Branch travels parallel to Austraw Road. Homes are scattered throughout the landscape, and a majority of the homes have maintained adequate riparian vegetation. The only noticeable impact or concern is the number of private ponds installed by landowners along tributaries and the main branch. The presence of ponds could impact the temperature of the water flowing through the entire subwatershed.

The North Branch and all of its tributaries feed the Latrobe Reservoir. It is surrounded entirely by a forested buffer and also gathers flow from one tributary that enters it directly from the west. Similar to the ponds found upstream, the reservoir could pose a temperature impact upon the watershed. At the output of the reservoir, the stream becomes Trout Run. Trout Run is a short stream section that flows through the most populated area in the entire Coalpit Run watershed. Algal growth was noted on the cobble substrate of the stream; it is uncertain whether the growth is from malfunctioning septic systems from streamside homes or is a result of plant decay associated with the reservoir upstream.

A single tributary joins Trout Run as it flows from the reservoir to meet the main branch of Coalpit Run. Due to homes flanking its streambanks, this tributary has a degraded riparian area. Downstream from the entrance of that tributary, Trout Run meets the main branch of Coalpit Run.

Water Quality

Table 2.B.1: Sample Site LWA-10 Coalpit Run					
Date Sampled	**pH**	**Alk. (mg/L)**	**TSS (mg/L)**	**TDS (mg/L)**	**Iron (mg/L)**
5/25/04	6.74	30.0	9.0	63.0	<0.06
8/25/04	7.13	47.0	5.0	74.0	<0.06
10/25/04	7.09	50.0	<1.0	97.0	0.2

The mouth of Coalpit Run was sampled quarterly throughout the assessment. Its water quality indicated very few or no upstream impacts and, therefore, no further samples were taken.

Sample Location:
Sample taken from the Route 30 eastbound bridge over Coalpit Run. The bridge is located just before the intersection of Route 259 and Route 30.

Conclusions

In general, the Coalpit Run Subwatershed received moderate scores reflecting very few impacts. Where impacts do exist, they are minimal and quickly dissipate in the overall flow of the main stem. The entire subwatershed flows through a landscape that has very little development. Headwater streams are well protected by the forested slopes of Chestnut Ridge and homeowners maintain adequate riparian vegetation on streambanks.

The most significant impact within the entire subwatershed is the dairy farm found upon the Coalpit Run main branch. In the summer of 2005, Western Pennsylvania Conservancy (WPC) facilitated the construction of various agricultural best management practices (BMPs) on that farm property. Therefore, this impact has since been eliminated from the subwatershed. Funding for the project was provided through federal and state grants including a DEP Growing Greener grant received by the LWA.

Recommendations

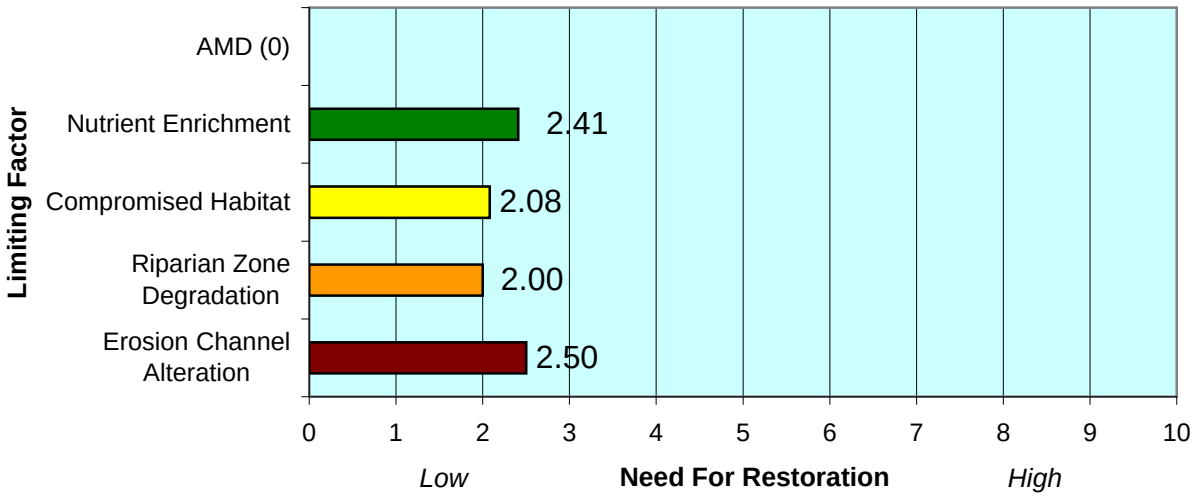
The following overall recommendations are made for the Coalpit Run Subwatershed:

- Educate subwatershed landowners about the importance of maintaining current un-developed properties and space. Encourage landowners to support smart growth and development within the area. Increase awareness regarding land conservation programs that can provide long-term protection of properties.
- Provide information to landowners regarding the maintenance of streambank riparian zones, low-impact timbering, and septic system maintenance.
- Work with Ligonier Township to address runoff from roads into tributaries.

Overall Restoration Priorities

Figure 2.B.2 exhibits overall restoration needs for the entire subwatershed. As indicated, the limiting factor that received the highest restoration need score was erosion and channel alteration. All scores were low for remediation need and no AMD sources were located within the watershed.

Figure 2.B.2: Restoration Priorities for the Coalpit Run Subwatershed



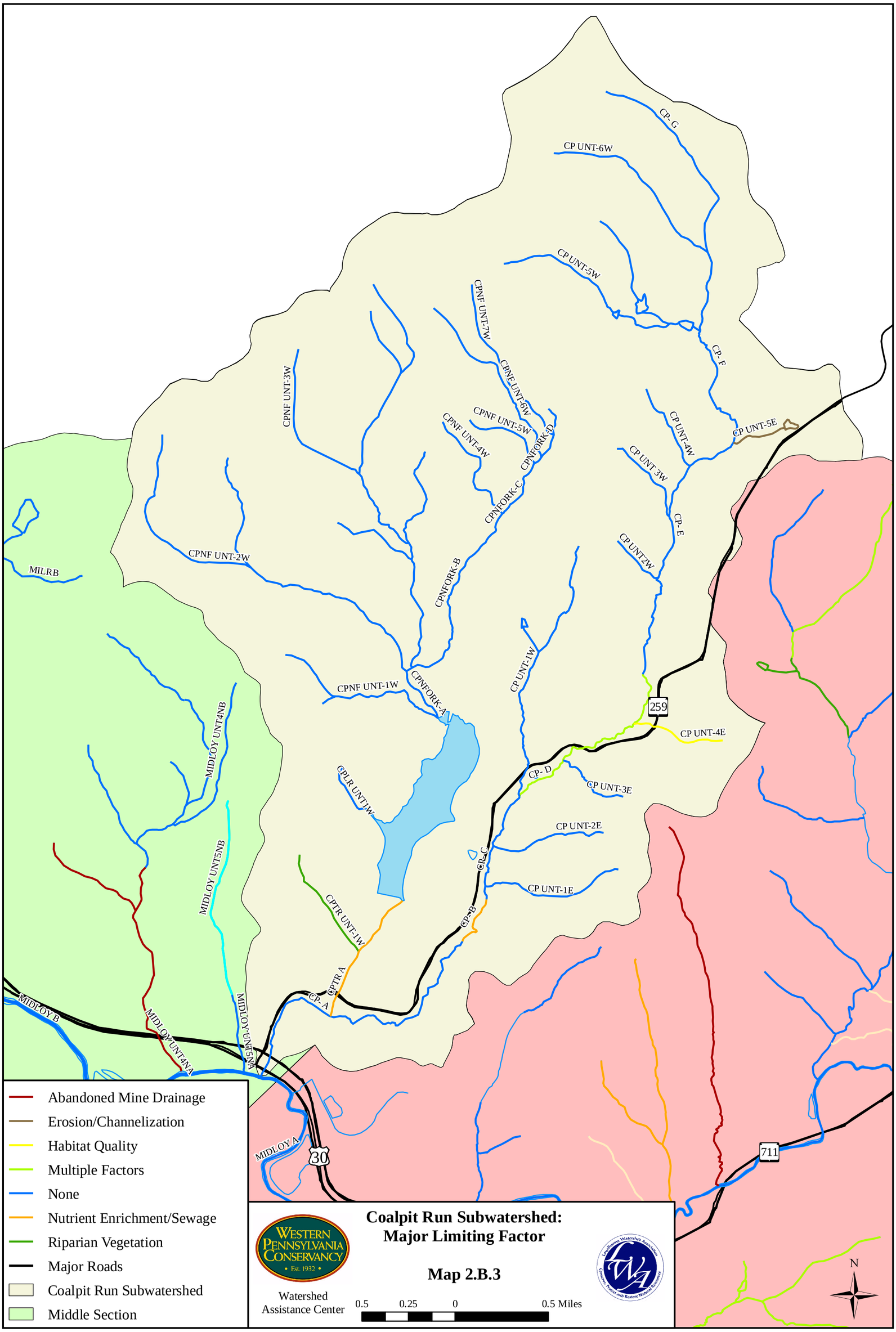
Restoration Suggestions for Individual Stream Segments

Six stream sections within the entire Coalpit Run Subwatershed received scores identifying limiting factors. The limiting factors identified were riparian vegetation degradation, nutrient enrichment, habitat quality degradation, and erosion and channel alteration. Please refer to Table 2.B.2 and Map 2.B.3 for impact description and stream segment locations.

Table 2.B.2: Impacted Stream Segments and Restoration Suggestions for the Coalpit Run Subwatershed

LIMITING FACTOR: Riparian Vegetation Degradation

Stream Segment Name	Description of Impact	Remediation Strategy	Possible Funding Sources	Priority Rating
CPB *Main stem stream segment flowing through a dairy farm.*	Cows have full access to the stream. Banks have been trampled causing erosion, and the substrate is mostly silt and mud. Barnyard and pastures are extremely muddy. Very little vegetation is found on streambanks.	1. Educate landowner. 2. Install agricultural BMPs, such as streambank fencing and stabilized stream crossings, to eliminate animal access to the stream. This will allow re-growth of streamside vegetation. Possible Partners: WPC, CUP, NRCS, WCD, PGC	CREP, Growing Greener, WHIP, EQIP	Medium


CP- G
CP UNT-6W
CP UNT-5W
CPNF UNT-7W
CPNF UNT-3W
CPNF UNT-6W
CP- F
CPNF UNT-5W
CP UNT-4W
CP UNT-5E
CPNF UNT-4W
CPNFORK-D
CP UNT-3W
CPNFORK-C
CP- E
CP UNT-2W
CPNF UNT-2W
MILRB
CPNFORK-B
CP UNT-1W
CPNF UNT-1W
CPNFORK-A
259
CP UNT-4E
MIDLOY UNT4NB
CP- D
CPLR UNT1W
CP UNT-3E
CP UNT-2E
MIDLOY UNT5NB
CP-C
CP UNT-1E
CPTR UNT-1W
CP-B
CPTR A
CP- A
MIDLOY B
MIDLOY UNT4NA
MIDLOY UNT5NA
MIDLOY A
30
711
Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Coalpit Run Subwatershed
Middle Section
Coalpit Run Subwatershed:
Major Limiting Factor
Map 2.B.3
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
0.5 0.25 0 0.5 Miles
N

CPTRUNT1W *Small tributary to Trout Run that drains in from the west below the Latrobe Reservoir. It flows through a residential area with a small cluster of homes and camps.*	Landowners have left very little streamside vegetation while caring for their lawns. There is trash scattered along the streambank as well. Substrate is silty.	1. Educate landowners. 2. Address lack of riparian vegetation by planting or allowing riparian vegetation to grow. 3. Encourage landowners to clean up trash in stream, if possible. Possible Partners: WCD, Ligonier Township	State, Local	Low
LIMITING FACTOR: Habitat Quality Degradation				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
CPD *Main stem section of the Coalpit Run main branch that flows parallel to Route 259.*	Because the stream crosses underneath the road multiple times, there are culverts located throughout this stream length. The culverts act as significant fish barriers because many of them rise above the elevation of the water. In addition, many driveways have culverts as well.	1. Investigate status of culverts and their effectiveness. Possible Partners: Ligonier Township	Local	Low
CPUNT4E *Small tributary to the Coalpit Run main branch that enters from the east. It flows adjacent to, and passes underneath, multiple roads.*	The tributary has moderate amounts of fish and macroinvertebrate habitat. The substrate is primarily gravel and sand. It is suspected that most of this is a result of high-flowing water eroding the existing channel.	1. Work with township to improve existing waterway. Possible Partners: Ligonier Township, WCD	Local, State	Low

LIMITING FACTOR: Erosion and Channel Alteration				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
CPD *Main stem section of the Coalpit Run main branch that flows parallel to Route 259.*	The channel of the stream has been altered to accommodate Route 259. Streambanks found close to culverts have been eroded.	1. Investigate stream channelization and effectiveness of existing culverts. Possible Partners: Ligonier Township, WCD	Local, State	Low
CPUNT5E *Small tributary to the Coalpit Run main stem that flows from a pond located close to Route 259.*	The stream substrate is more than 40% embedded. The source of silty substrate is unknown due to moderate erosion and very little channel alteration. A pond at the headwaters could possibly contribute silt during high flow.	1. Determine sediment source and remediate. Possible Partners: WCD	Local, State	Low
LIMITING FACTOR: Nutrient Enrichment				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
CPB *Main stem stream segment flowing through a dairy farm.*	Cows have direct access to the stream, contributing nutrients in the form of manure to the stream section.	1. Install agricultural BMPs. Possible Partners: WPC, WCD, NRCS, PGC	CREP, Growing Greener, WHIP, EQIP	Medium
CPTRA *Main stem section of Trout Run, part of the North Branch of Coalpit Run.*	Suspected failing septic systems in small residential area. Stream substrate shows large mats of algae.	1. Investigate algal source. 2. Work with landowners to adopt BMPs for septic systems. Possible Partners: Ligonier Township, PSCE	Local, Federal	Low

SECTION 2.C
FOURMILE RUN

Section 2.C

Fourmile Run Subwatershed

General Description

The Fourmile Run Subwatershed originates at the intersection of Route 711 and the Pennsylvania Turnpike in Donegal. It is located in Ligonier and Cook townships, south of Route 30, west of Route 711, and north of the turnpike. Its 39.74 square miles are a mix of rural and forested landscapes. The watershed is known for a lake close to its headwaters that is managed by the PAFBC. Donegal Lake is frequented by anglers and is stocked yearly.

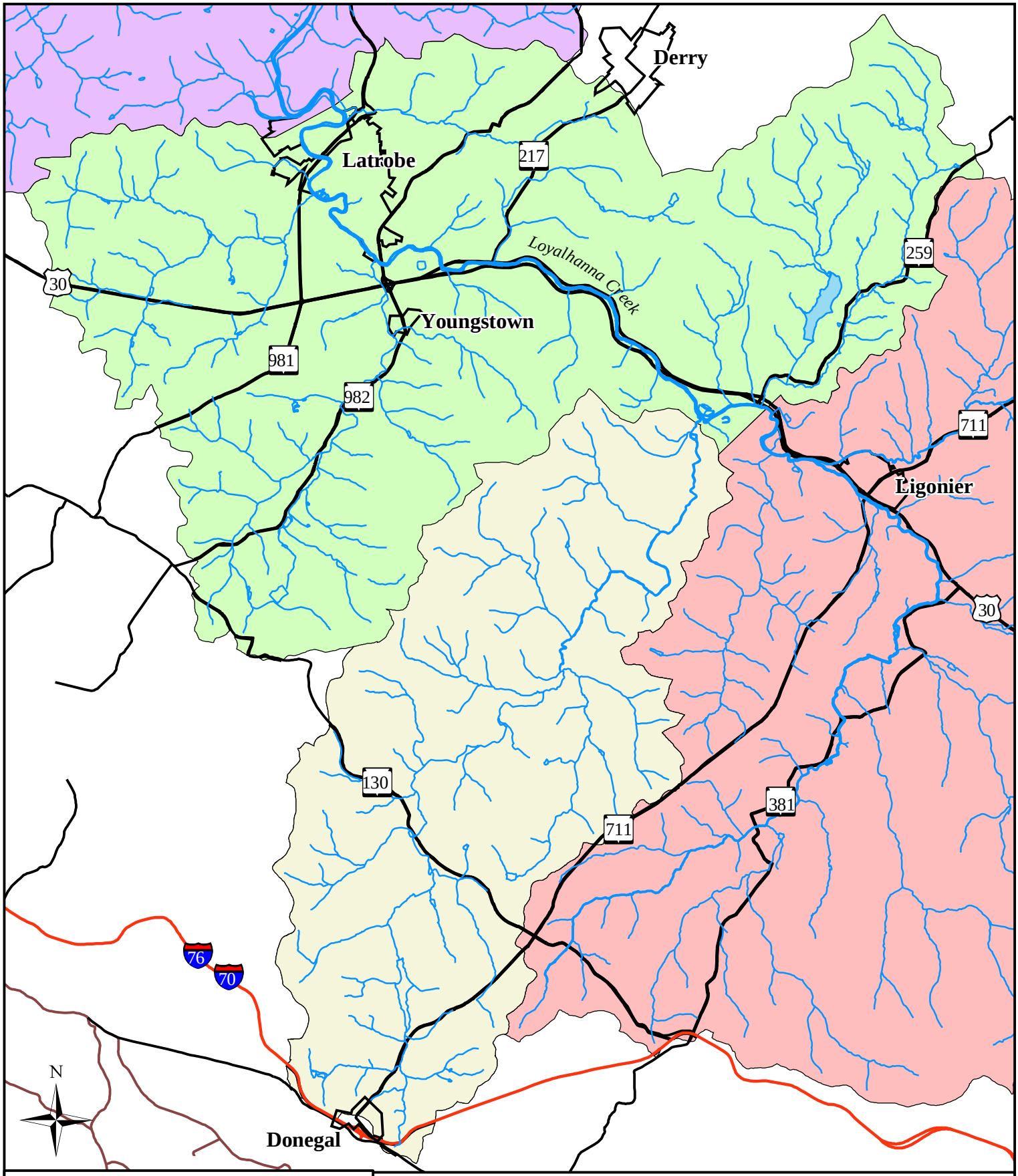
The main stem of Fourmile Run, close to its mouth in downtown Darlington

The headwaters of Fourmile Run flow from a pond that trickles into a stream and immediately underneath the turnpike. For approximately one to two miles, the main stem makes its way south through a forest, residential area, and a farm. After passing underneath Route 711, Fourmile Run spills into Donegal Lake. Donegal Lake was built in 1967 to provide recreational angling and non-powered boating. The 90-acre lake is full of a wide variety of fish species, including bass, and sunfish.

At the outflow of Donegal Lake, Fourmile Run retreats into a forested landscape with scattered streamside residences. Just downstream of the lake outlet, the main stem meanders along the western border of Randall Reserve, a 400-acre area of protected land. After flowing past the reserve, Fourmile Run passes underneath Route 130. The surrounding landscape continues to be consistently dominated by forest until the stream shoots under Bethel Church Road. It is at this point that the stream begins to widen and flow more slowly. A small cluster of residences and few businesses are concentrated at the intersection of Fourmile Run and Bethel Church Road, many of which are close to the stream. Downstream of the small community, Fourmile Run flows through a wide, flat area choked with small trees and scrubby vegetation. As Fourmile Run continues to flow south, it makes its way back into a forested area with steep banks on either side. At this point, the depth and velocity of the stream increases.

Two miles from the mouth of Fourmile Run, the character of stream changes significantly again. The change occurs at the outskirts of Darlington and it is through this community that Fourmile Run moves through another wide, flat area. Homes and camps are scattered along the streambank until it meets the Loyalhanna Creek main stem. That confluence occurs just upstream of the Darlington Road Bridge and directly behind the western end of Idlewild Park.

Fourmile Run is classified as a TSF. Please refer to Map 2.C.1 for the geographic location of this subwatershed.



Fourmile Run Subwatershed: Overall Location

Map 2.C.1

Western Pennsylvania Conservancy
Watershed Assistance Center

1 0.5 0 1 Miles

Review of Historic Information

PA Fish and Boat Commission 1987 (PAFBC)

A fish survey completed in 1987 showed good diversity of warm- and cold-water fish species. Two sites were sampled along a very long stretch of stream extending from below Donegal Lake toward the community of Darlington. Chemical testing showed that the water was alkaline and had good overall quality. The recommendation was made to upgrade the current Chapter 93 designation of Fourmile Run from Trout Stocked Fishery to High Quality Trout Stocked Fishery. At the time of this report, no such change was made.

The report also mentioned mining permits issued for the area and the potential for impact upon the stream. No widespread mining was completed; the only known mining was performed by Amerikohl to remediate an old surface mine site.

PA Fish and Boat Commission 1996 (PAFBC)

A fish survey of Donegal Lake was completed in 1996 in order to determine frequency, ages, and sizes of warm- and cold-water fish species. Trap nets and flat-bottom boat night electro-fishing were used to collect species. The survey concluded that fish species in Donegal Lake were of poor overall quality and improvements needed to be made to the lake. A major management recommendation was to continue draw-downs every other year to control dense macrophyte (water plants) population. More than 45% of the lake had been covered in years leading up to the survey.

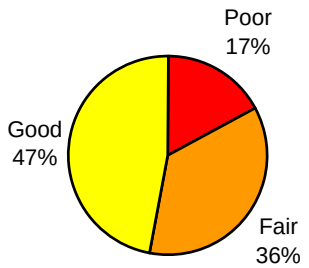
The survey focused primarily upon the lake itself and no upstream investigations were conducted to determine source nutrition for macrophyte population. It is assumed that agricultural factors upstream are influencing the excessive growth of macrophytes.

Visual Assessment Summary

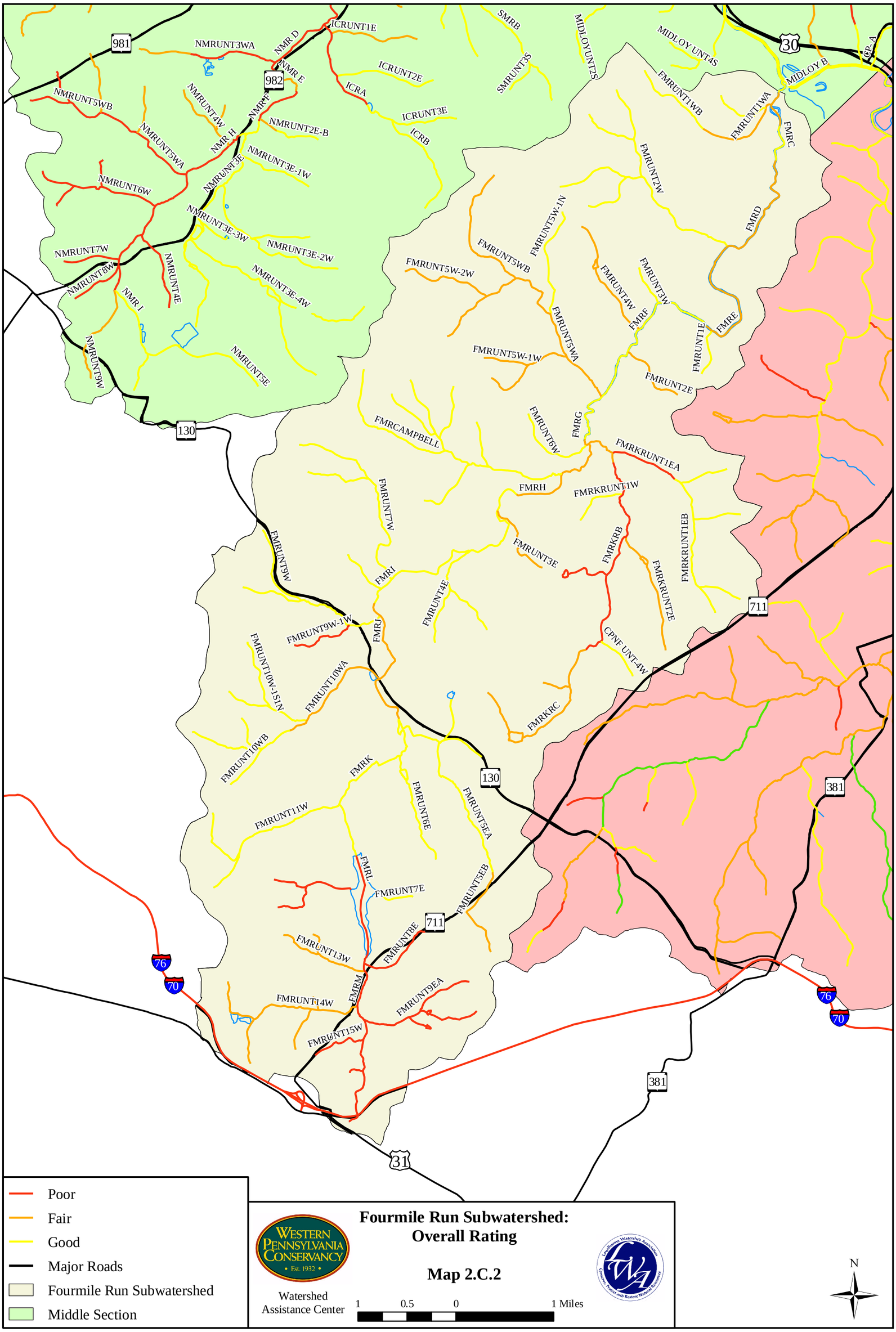
Visual Assessment Findings

The visual assessment of the Fourmile Run Subwatershed was completed in the fall of 2004. A total of 58 stream segments were assessed. As depicted in Figure 2.C.1, 47% of the subwatershed received a good rating, 36% received a fair rating, and 17% received a poor rating. An average score of 7.25 was given to the entire subwatershed, which is a good rating overall.

Figure 2.C.1: Visual Assessment Ratings for the Fourmile Run Subwatershed



The ratings given during the assessment reflect good riparian vegetation and canopy cover throughout the majority of the watershed. In addition, the overall good rating shows the presence of very few impacts over the entire length of stream. Existing impacts are concentrated to specific areas of the subwatershed and are not consistent throughout. Individual stream ratings are depicted in Map 2.C.2.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ICRA
ICRUNT3E
ICRB
NMRUNT3WA
NMR D
NMR E
NMR F
NMR H
NMR I
NMRUNT4W
NMRUNT5WB
NMRUNT5WA
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NMRUNT3E-4W
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SMRUNT3S
MIDLOYUNT2S
MIDLOY UNT4S
MIDLOY B
GP_A
FMRUNT1WB
FMRUNT1WA
FMRC
FMRUNT2W
FMRD
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FMRE
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FMRUNT8E
FMRUNT13W
FMRM
FMRUNT9EA
FMRUNT14W
FMRUNT15W
Poor
Fair
Good
Major Roads
Fourmile Run Subwatershed
Middle Section
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
Fourmile Run Subwatershed:
Overall Rating
Map 2.C.2
1 0.5 0 1 Miles
N

Visual Assessment Description

Fourmile Run Main Stem

Fourmile Run originates in a grazed field south of the PA Turnpike in Donegal Township. It immediately passes underneath the turnpike and flows north toward Stahlstown. Its substrate is dominated by cobble slightly embedded by silt and mud. The source of sediment is various agricultural operations located throughout its headwater stretch and some eroding banks. Landowners throughout the headwater section consistently remove riparian vegetation from the streamside, thus creating increased occurrence of erosion. Within the headwater section, UNT9E enters the main stem carrying excess nutrients from upstream agricultural operations. Multiple cows, horses, and goats have access to the tributary for a significant length.

After collecting flow from four tributaries, the main stem passes underneath Route 711 and empties into Donegal Lake. At the time of the assessment, the lake was drawn down in order to kill plants growing around the edge of the lakeshore. Observations of the lake included a mucky bottom, cloudy water appearance, and stabilization of shorelines. The 90-acre lake acts as a sediment and nutrient trap. In addition, it creates an increase in overall water temperature for Fourmile Run as it continues to flow north.

Leaving the lake, Fourmile Run moves through a deciduous forest. Residences are sparse and, in only one case, impact the stream by removing streamside vegetation. The stream substrate is dominated by cobble and shows less embeddedness than the headwater area. With an active channel width of 18-20 feet, the stream begins to grow as it continues to flow. Prior to passing by the Randall Reserve, the main stem collects flow from UNT11W. This tributary stream is littered with garbage, including washing machines, refrigerators, and other household items.

After passing the littered tributary, Fourmile Run continues to flow through a forested area until it passes underneath Route 130. Residences come close to the stream and a large field and park dominate one side of the main stem. The substrate shows a sudden change and becomes primarily gravel and silt rather than cobble. Lack of riparian vegetation along streambanks is a reason for the substrate change. Eroding soil from fields, lawns, and streambanks appears in the stream and embeddedness increases.

Field and park along Fourmile Run where the riparian area has been removed

The impact from the park and residential area extends approximately 500-700 feet of stream. Following this section, the Fourmile Run main stem returns to an area dominated by forest. The stream substrate recovers and is once again becomes mostly cobble. For the first time, boulders are also present within the substrate.

Fourmile Run remains unchanged until it flows underneath Bethel Church Road. The landscape flattens and the main stem moves through an area choked with small trees and shrubs. Several residences are located along the streambank. Despite increased residences, the main stem maintains adequate riparian vegetation and canopy cover. The substrate continues to be composed of mostly cobble with a mix of boulder, gravel, and silt. Some questionable pipes were noted within the residential area

As Fourmile Run flows away from its encounter with Bethel Church Road, the channel narrows and becomes deep. It was noted during the assessment that the depth of the stream was significant and noticeably different than other stream sections. Due to the velocity of the stream flowing through this section, there were areas of minimal erosion. That erosion creates the presence of some silt embedded within the cobble substrate that dominates the section.

Approximately one mile from the mouth, the stream changes significantly, becoming wider and shallower. The surrounding landscape flattens and the number of homes close to the streambank increases. Despite the change in landscape, the stream substrate continues to maintain its cobble substrate. Moving into Darlington and closer to the mouth, Fourmile Run becomes further impacted by the presence of residences. The main stem flows close to the road and has been channelized in order to protect the road and homes. Riprap and other stabilization methods installed by landowners are scattered along the streambank. Canopy cover remains present through the Darlington area despite the excessive removal of other vegetation. High, eroding banks are common as the main stem flows its last 500 yards prior to meeting the Loyalhanna Creek.

Fourmile Run Named and Unnamed Tributaries

Multiple tributaries enter the main stem of Fourmile Run as it flows northward. Those tributaries emulate the quality of the main stem into which they flow. There were a limited number of tributaries that had characteristics worthy of mentioning. UNT5W is a tributary that enters the Fourmile Run main stem from the west. It originates on the Chestnut Ridge and its source can be accessed from Route 130. A portion of the land through which this tributary flows was surface mined. Topographic maps did not indicate the presence of past mining, nor did historical information from DEP. The main stem of UNT5W is briefly impacted as water seeps from the mined area with a pH of 4.9. The water is stained orange, indicating the presence of iron. Above the input of water from the mined area, the pH of the stream is 6.2; below the input it is 5.7. At the mouth, the pH has recovered to 7.4 with no visible signs of mine drainage.

A second notable tributary is UNT9E, located close to the headwaters of Fourmile Run. Entering from the east, it flows into the main stem of Fourmile Run following the path of Franklin Road on the border of Donegal and Cook townships. The stream is impacted by livestock that have direct access to the stream. It is anticipated that streambank fencing and other agricultural BMPs will be installed to address the livestock impact in the near future.

Finally, Keffer Run, a named tributary to Fourmile Run was assessed as the most heavily impacted portion of the entire watershed. Its entire main stem rated poor overall due to nutrient enrichment and degradation of riparian vegetation. The combination of agricultural operations and residences along the stream caused the notable impacts.

Water Quality

Water quality samples were taken at the mouth of Fourmile Run throughout the assessment. Because the sample location was behind private residences, if landowners were not home, samples were not collected. Water quality indicated very few or no upstream impacts. In addition, visual assessment information did not point to any stream segments or tributaries with major impacts. Therefore, no further samples were made on Fourmile Run.

Table 2.C.1: Sample Site LWA-8 Fourmile Run

Date Sampled	pH	Alk. (mg/L)	TSS (mg/L)	TDS (mg/L)	Iron (mg/L)
5/25/04	6.80	23.0	5.0	84.0	<0.06
10/25/04	6.29	47.0	2.0	142.0	0.7

Sample Location: Sample taken 500 feet upstream from the mouth of Fourmile Run. Travel on Route 30 East and turn right onto Darlington Road. Cross bridge over Loyalhanna Creek and pull over immediately. Walk upstream along Loyalhanna Creek until reaching confluence with Fourmile Run. Sample was taken 500 feet upstream from the mouth of Fourmile Run.

Conclusions

The overall quality of the Fourmile Run Subwatershed was noteworthy. It received an overall score of 7.25, which is an overall good rating. That rating can be attributed to the presence of few severe impacts. A majority of the Fourmile Run Subwatershed flows through a forested landscape and therefore maintains adequate riparian vegetation. Rated as a TSF, Fourmile Run is stocked seasonally by the PAFBC. There are many public fishing access sections along the main stem of the stream.

As with many of the large tributaries within the Loyalhanna Creek Watershed, Fourmile Run could benefit from a change in the way landowners care for streams flowing through their properties. Where visual assessment ratings were low, it was consistently because of either the removal of riparian vegetation during lawn manicuring or the failure of household septic systems. The latter was more prevalent closer to the Darlington community, where a known problem exists.

It is important to stress that the entire Fourmile Run Subwatershed is composed of a mix of large and small tracts of privately owned land. With increasing developmental pressure within the region, citizens within the subwatershed should be made aware of the value of their area and the need to preserve that value. Future development of lands surrounding the stream could have a negative impact upon water quality.

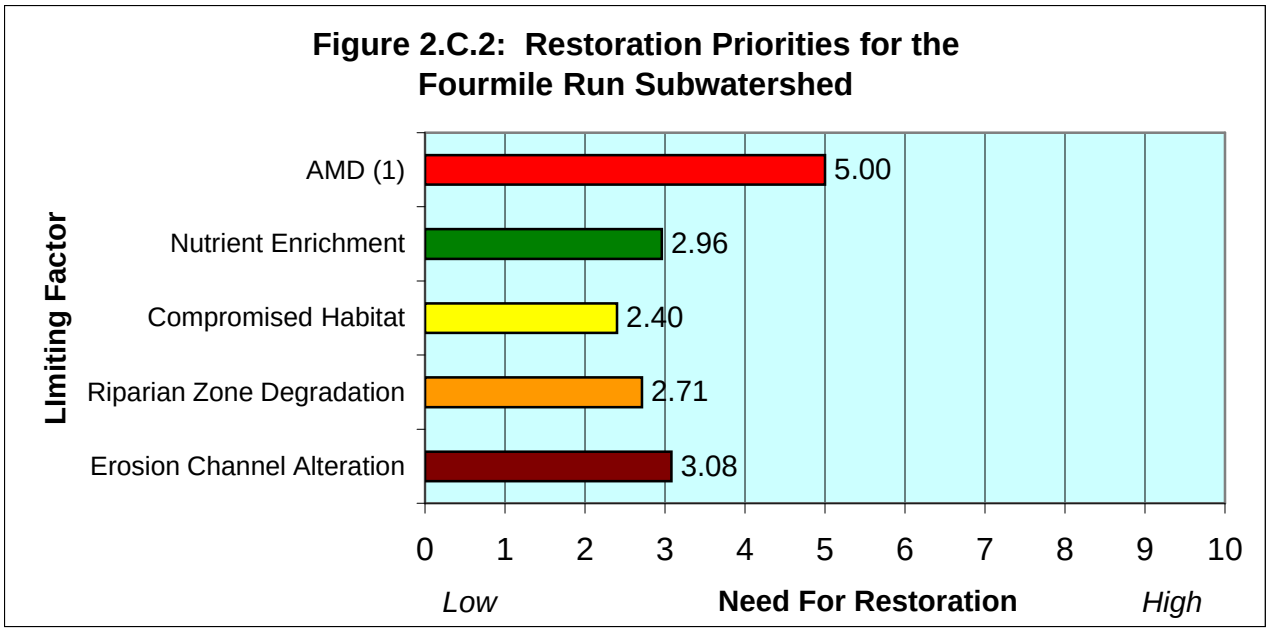
Recommendations

The following overall recommendations are made for the Fourmile Run Subwatershed:

- Provide information to landowners regarding the maintenance of streambank riparian zones, low-impact timbering and septic system maintenance. This can be accomplished through public meetings, workshops, and/or pamphlets.
- Work with Ligonier Township and Cook Township to encourage minimal development and smart growth throughout the watershed landscape.
- Educate landowners about the overall quality of the Fourmile Run Subwatershed and how they can protect their land through various programs, including agricultural land preservation and conservation easements.
- Continue to work with the Darlington community to install sewerage.
- Investigate small AMD seep from tributary UNT5W.
- Work with the PAFBC to address nutrient loading in Donegal Lake. This can be accomplished by investigating total load from upstream sources.
- Install agricultural BMPs on those stream sections most impacted by livestock and farming including UNT9 and Keffer Run.

Overall Restoration Priorities

Figure 2.C.2 exhibits restoration priorities for the entire subwatershed. As indicated, all limiting factors rate low for restoration need. Despite the high restoration priority score for AMD, only one source of AMD was located and that source had no negative impact upon its receiving stream or the main stem of Fourmile Run.



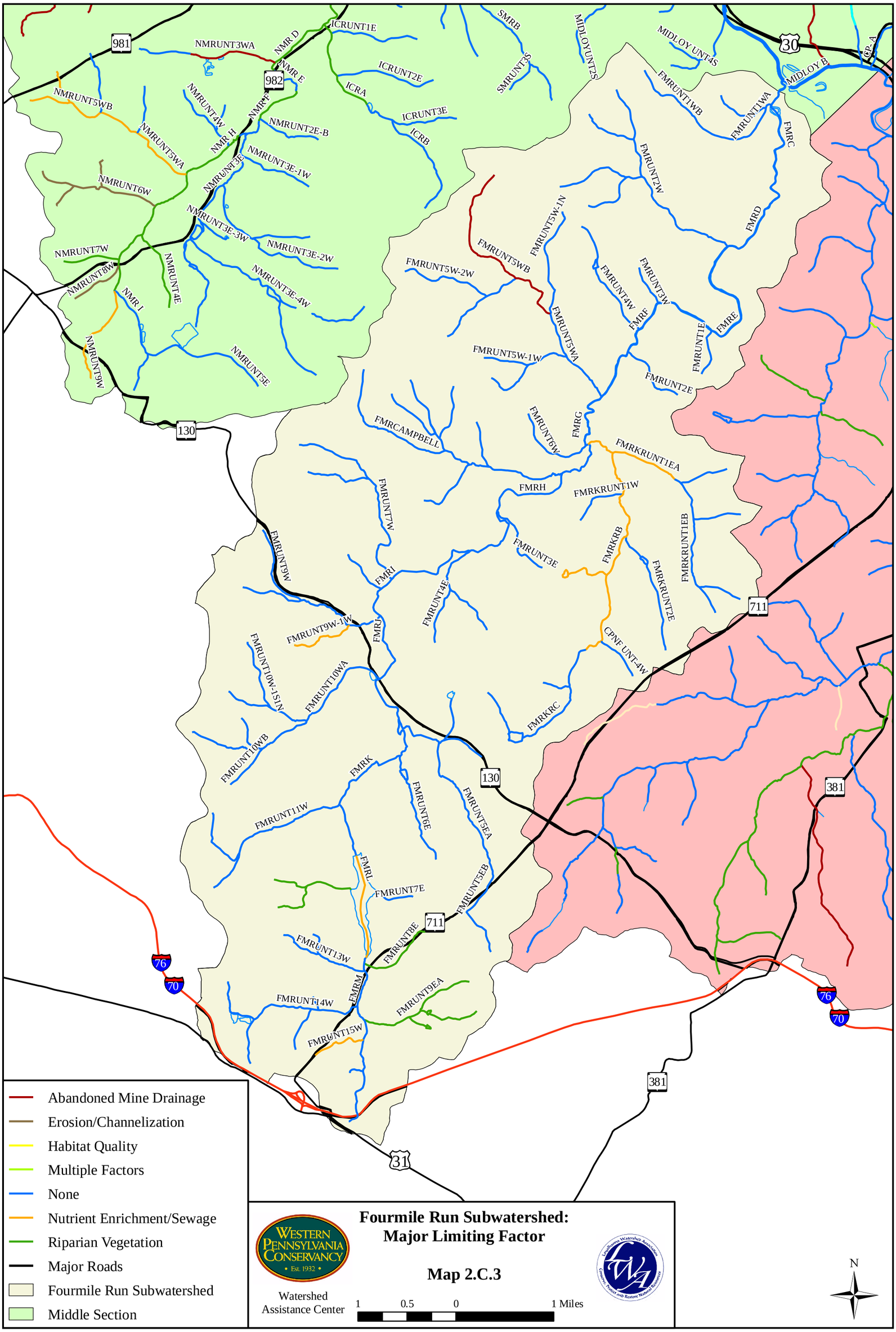
Restoration Suggestions for Individual Stream Segments

Fourteen stream sections within the entire Fourmile Run Subwatershed received scores identifying limiting factors. The limiting factors identified were riparian vegetation degradation, nutrient enrichment, erosion and channel alteration, and AMD. Please refer to Table 2.C.2 and Map 2.C.3 for impact description and stream segment locations.

Table 2.C.2: Impacted Stream Segments and Restoration Suggestions for the Fourmile Run Subwatershed

LIMITING FACTOR: Riparian Vegetation Degradation

Stream Segment Name	Description of Impact	Remediation Strategy	Possible Funding Sources	Priority Rating
FMRL *Section encompasses all of Donegal Lake.*	One side, or approximately 45%, of the lake is surrounded by forest. The remainder of the lake is surrounded by park-like areas with easy fishing access.	1. Work with PAFBC to increase riparian vegetation surrounding the lake. Possible Partners: PAFBC, PAGC	Local, State	Low – Medium


981
982
30
130
711
381
76
70
31
NMRUNT3WA
NMR D
NMR E
NMR F
NMR H
NMR I
ICRUNT1E
ICRUNT2E
ICRA
ICRUNT3E
ICRB
NMRUNT2E-B
NMRUNT3E-1W
NMRUNT3E-2W
NMRUNT3E-3W
NMRUNT3E-4W
NMRUNT3E
NMRUNT4E
NMRUNT4W
NMRUNT5E
NMRUNT5WA
NMRUNT5WB
NMRUNT6W
NMRUNT7W
NMRUNT8W
NMRUNT9W
SMRB
SMRUNT3S
MIDLOYUNT2S
MIDLOY UNT4S
MIDLOY B
GP A
FMRUNT1WB
FMRUNT1WA
FMRC
FMRUNT2W
FMRD
FMRUNT5W-1N
FMRUNT5WB
FMRUNT5W-2W
FMRUNT5W-1W
FMRUNT5WA
FMRUNT4W
FMRE
FMRUNT3W
FMRUNT1E
FMRUNT2E
FMRG
FMRUNT6W
FMRCAMPBELL
FMRKRUNT1EA
FMRH
FMRKRUNT1W
FMRUNT7W
FMRUNT9W
FMRUNT3E
FMRKRB
FMRKRUNT1EB
FMRI
FMRUNT4E
FMRKRUNT2E
FMRUNT9W-1W
FMRJ
CPNF UNT-4W
FMRUNT10W-1S1N
FMRUNT10WA
FMRKRC
FMRUNT10WB
FMRK
FMRUNT6E
FMRUNT5EA
FMRUNT11W
FMRL
FMRUNT7E
FMRUNT5EB
FMRUNT8E
FMRUNT13W
FMRM
FMRUNT9EA
FMRUNT14W
FMRUNT15W
Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Fourmile Run Subwatershed
Middle Section
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
Fourmile Run Subwatershed:
Major Limiting Factor
Map 2.C.3
1 0.5 0 1 Miles
N

FMRM *Main stem section of stream that extends from Donegal Lake to the headwaters of Fourmile Run.*	Fields, farms, and residences surround the stream, all of which have limited riparian vegetation. Much mowing and clearing occurs on properties. In addition, this section of stream passes underneath Route 711 and the PA Turnpike.	1. Work with landowners to remediate riparian vegetation surrounding the stream by planting trees and shrubs. 2. Install agricultural BMPs in portion impacted by livestock. Possible Partners: WPC, WCD, PAGC, NRCS	State, Federal	Low – Medium *(due to headwater location)*
FMRUNT8E *Small tributary stream that enters the main stem right before it spills into Donegal Lake. It flows parallel to Route 711 on the eastern side.*	The tributary flows through crop fields and pasturelands where trees and shrubs have been removed from the bank to make way for corn and hay. Residences along the stream mow lawns directly to streambanks. Less than 50% of the stream is shaded by canopy cover.	1. Educate landowners about the importance of riparian zone vegetation around streams. 2. Replant trees and shrubs streamside. Possible Partners: WPC, WCD, PAGC, NRCS, FSA	State, Federal	Low
FMR9W-1W *Small tributary to UNT9W that flows along Ridge Road. Stream flows through pasture, forest, and residential area.*	Due to excessive grazing of livestock and mowing, the riparian area along the stream has been partially removed. Very little vegetation surrounds the stream. As a result, soil removal has increased, and silt occupies more than 40% of the substrate.	1. Educate landowners. 2. Install agricultural BMPs to remove livestock from stream. Restore riparian area along the streambank by allowing re-growth or with plantings. 3. Encourage landowner to work with federal agencies to develop a grazing plan for the entire operation. Possible Partners: WPC, WCD, NRCS, PAGC, FSA	CREP, EQIP, Growing Greener, State, Federal, Private	Low – Medium

FMR9EA *Small tributary that flows along Franklin Road, through pasture with grazing livestock, including goats and horses.*	Grazing has eliminated a majority of the streamside vegetation. Less the 50% of the stream is shaded by canopy.	1. Educate landowners. 2. Install agricultural BMPs to remove livestock from stream. Restore riparian area along the streambank by allowing re-growth or with plantings.	CREP, EQIP, Growing Greener, State, Federal, Private	Medium *(due to headwater location and extent of impact)*
FMRUNT12W *Tributary of Fourmile Run that flows into Donegal Lake from the west. It begins in a large forest and then breaks out into large field.*	There is a forest at the headwaters of the stream, but for a majority of the length it flows through a large field that is mowed. The only canopy cover available to the stream is at the headwater area.	1. Educate landowners. 2. Encourage landowners to allow re-growth of vegetation and trees around the stream and streambank. Possible Partners: WCD, WPC, NRCS, PAGC, FSA, DEP	State, Federal, Private	Low – Medium
FMRKRB *Main stem portion of Keffer Run, a large tributary to Fourmile Run. The stream flows through a large pasture and residential area.*	Horse and beef graze land surrounding the stream. Riparian vegetation has been removed due to grazing livestock and by mowing at residences.	1. Educate landowners. 2. Install agricultural BMPs to remove livestock from stream. Restore riparian area along the streambank by allowing re-growth or with plantings. Possible Partners: WPC, WCD, NRCS, PAGC, FSA, DEP	CREP, EQIP, Growing Greener, State, Federal, Private	Medium *(due to extent of impact)*
FMRKRC *Main stem section of Keffer Run, a large tributary to Fourmile Run. The stream section flows through a mix of pasture, forest, and residential areas.*	Streamside riparian vegetation is intermittent throughout the entire length of the stream. Canopy cover is limited because vegetation is in the form of shrubs and small trees.	1. Educate landowners. 2. Encourage landowners to replant and restore riparian areas along the stream. Possible Partners: WCD, WPC, DEP	Local, State, Federal, Private	Low

FMRKRUNT1EA *Section A of an unnamed tributary to Keffer Run. The tributary follows Jefferson School Road, flowing through an area mixed with fields and residences.*	There is a field on one side of the stream and forest on the other side. Where homes exist, landowners are mowing lawns directly to the streambank. Canopy cover is extremely limited near residences and only present on half of the stream where it flows through fields.	1. Educate landowners. 2. Encourage landowners to replant and restore riparian areas along the stream. Possible Partners: WCD, WPC, DEP	Local, State, Federal, Private	Low
LIMITING FACTOR: Erosion and Channel Alteration				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
FMRUNT8E *Small tributary stream that enters the main stem right before it spills into Donegal Lake. It flows parallel to Route 711 on the eastern side.*	There is some visible erosion throughout the length of the tributary. Rip rap has been used to stabilize the stream and to maintain the channel. Where it passes underneath Route 711 it has been channelized.	1. Investigate channelization and use of rip rap for streambank stabilization. 2. Educate landowner and work with them to establish alternate methods of bank stabilization to control erosion. Possible Partners: Cook Township, DEP, WCD, WPC	Local, State, Private	Low
FMR9EA *Small tributary that flows along Franklin Road through pasture with grazing livestock, including goats and horses.*	The stream is channelized through the various properties in order to accommodate for ponds. The stream has high banks that are eroding due to the access of animals to the stream. The sediment is heavily embedded with silt from erosion and livestock trampling.	1. Educate landowner. 2. Install agricultural BMPs to remove livestock from stream, thus eliminating major cause of erosion. Possible Partners: WPC, WCD, NRCS, PAGC, FSA, DEP	CREP, EQIP, Growing Greener, State, Federal	Medium (*due to location and extent of impact)*

FMRUNT12W *Tributary of Fourmile Run that flows into Donegal Lake from the west. It begins in a large forest and then breaks out into large field.*	The stream is channelized through the field and past residential areas. It travels underneath Fourmile Run Road, where channelization also occurs.	1. Educate landowners. 2. Investigate cause of channelization. 3. Work with landowner to establish erosion control along streambanks other than channelization. Possible Partners: WPC, WCD, NRCS, FSA, Cook Township	State, Federal, Private	Low
FMRUNT15W *Small tributary located in the headwater area of Fourmile Run. It originates very close to Route 711 and flows through grazed pasture.*	The stream is partially channelized where it flows beside Route 711. It has very high banks and road runoff seems to cause some of that erosion. Further downstream, livestock in stream trample bank. The stream substrate is 30-40% embedded with silt.	1. Educate landowners. 2. Work with township to address road runoff and impact upon stream from channelization close to the road. 3. Install agricultural BMPs. Possible Partners: Cook Township, WPC, WCD, NRCS, PAGC, FSA, DEP	Local, State, Federal, Private	Low
FMRKRUNT1EA *Section A of an unnamed tributary to Keffer Run. The tributary follows Jefferson School Road, flowing through an area mixed with fields and residences.*	Rip rap has been used on streambanks through residential area to stabilize. There is some erosion and the substrate is 30-40% embedded with silt.	1. Educate landowners. 2. Work with landowners to install alternate methods of streambank stabilization, such as vegetation. Possible Partners: Cook Township, WCD, WPC, DEP	Local, State, Private	Low
FMRKRUNT3E *Small tributary to Keffer Run. The stream flows through fields and residential area along Keffer Run Road toward Mansville.*	Keffer Run Road has a significant effect upon the stream. In order to protect road and residences, the stream has been channelized. Rip rap has been used to stabilize banks and the stream is heavily embedded with silt.	1. Educate landowners. 2. Work with landowners and township to install streambank stabilization. 3. Address soil loss from upstream fields that could be adding sediment to the stream. Possible Partners: Cook Township, WPC, WCD, NRCS	Local, State, Federal, Private	Low

LIMITING FACTOR: Nutrient Enrichment				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
FMRH *Main stem section that extends from the Jefferson School Road Bridge upstream to Bethel Church Road Bridge.*	Questionable pipes noted throughout the stream section. Multiple residences located along the streamside.	1. Educate landowners about BMPs for household septic systems. Possible Partners: RUS, Ligonier Township, PSCE	Local, State	Low
FMRL *Section encompasses all of Donegal Lake.*	Excessive growth of macrophytes along lakeshore.	1. Work with PAFBC to eliminate possible upstream sources of nutrients. Possible Partners: PAFBC, WPC, DEP	State, Federal, Private	Medium
FMRUNT9W-1W *Small tributary to UNT9W that flows along Ridge Road. Stream flows through pasture, forest, and residential area.*	Livestock have direct access to the stream.	1. Educate landowners. 2. Install agricultural BMPs that will limit and/or eliminate livestock access to the stream. Possible Partners: WPC, WCD, PAGC, NRCS, FSA, DEP	State, Federal, Private	Low
FMRUNT9EA *Small tributary that flows along Franklin Road through pasture with grazing livestock, including goats and horses.*	Livestock have direct access to the stream.	1. Educate landowners. 2. Install agricultural BMPs that will limit and/or eliminate livestock access to the stream. Possible Partners: WPC, WCD, PAGC, NRCS, FSA, DEP	State, Federal, Private	Medium *(due to headwater location)*
FMR15W *Small tributary located in the headwater area of Fourmile Run. It originates very close to Route 711 and flows through grazed pasture.*	Livestock have direct access to the stream.	1. Educate landowners. 2. Install agricultural BMPs that will limit and/or eliminate livestock access to the stream. Possible Partners: WPC, WCD, PAGC, NRCS, FSA, DEP	State, Federal, Private	Medium *(due to headwater location)*

FMRKRA *Main stem section of Keffer Run, a large tributary to Fourmile Run. A mix of residences and forest surrounds the stream.*	Excessive algal growth on stream substrate. Upstream agricultural operations and suspected household sewage inputs are most likely the cause.	1. Educate landowners. 2. Encourage landowners through section to install BMPs for septic systems. 3. Address upstream agricultural impacts. Possible Partners: WPC, WCD, PAGC, NRCS, FSA, DEP, PSCE	State, Federal, Private	Low
FMRKRB *Main stem portion of Keffer Run, a large tributary to Fourmile Run. The stream flows through a large pasture and residential area.*	Livestock have direct access to a large portion of this section.	1. Educate landowners. 2. Install agricultural BMPs that will limit and/or eliminate livestock access to the stream. Possible Partners: WPC, WCD, PAGC, NRCS, FSA, DEP	State, Federal, Private	Low
FMRKRUNT1EA *Section A of an unnamed tributary to Keffer Run. The tributary follows Jefferson School Road, flowing through an area mixed with fields and residences.*	Significant algal growth along stream bottom. No indications of upstream impacts from agriculture. Possible household sewage input from residences.	1. Investigate source of algal growth. 2. Encourage landowners to install BMPs for septic systems. Possible Partners: WCD, DEP, WPC	State, Federal	Low
FMRKRUNT3E *Small tributary to Keffer Run. The stream flows through fields and residential area along Keffer Run Road toward Mansville.*	Significant algal growth along stream bottom. Possible household sewage input from residences.	1. Investigate source of algal growth. 2. Encourage landowners to install BMPs for septic systems. Possible Partners: WCD, DEP, WPC	State, Federal	Low

LIMITING FACTOR: Abandoned Mine Drainage				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
FMRUNT5WB *Section of a large tributary entering Fourmile Run from the west. The tributary originates upon Chestnut Ridge and section B flows through a forested section, ending at an area that was surface mined.*	Iron staining in stream at the close of the section. Area looks like an old surface mine area with smaller, scrubby pine trees and grasses growing. The iron seep had a field pH of 4.9. Field pH above the seep was 6.2 and below the seep was 5.7. Downstream, no iron staining was visible.	1. Investigate surface mine site and determine course of action with the DEP Mining Office. Possible Partners: DEP	State, Federal	Low *(due to lack of downstream impact)*

SECTION 2.D
MILLER RUN

Section 2.D

Miller Run Subwatershed

General Description

Miller Run main stem, looking upstream from the Latrobe Water Authority building

The 3.57 square-mile Miller Run Subwatershed drains the western slope of Chestnut Ridge and meets the Loyalhanna Creek main stem at the junction of Route 30 and Route 217. In its headwaters, a large reservoir is fed by multiple headwater spring sources emanating from limestone rock outcroppings. After pouring from the reservoirs, Miller Run cascades through a heavily forested hollow west toward Latrobe. The waterway does not encounter any residences until it reaches a Kennametal plant and small cluster of homes near Route 217. Upon passing underneath Route 217, Miller Run turns south and flows to meet the Loyalhanna Creek. This confluence occurs directly below the Kingston Dam.

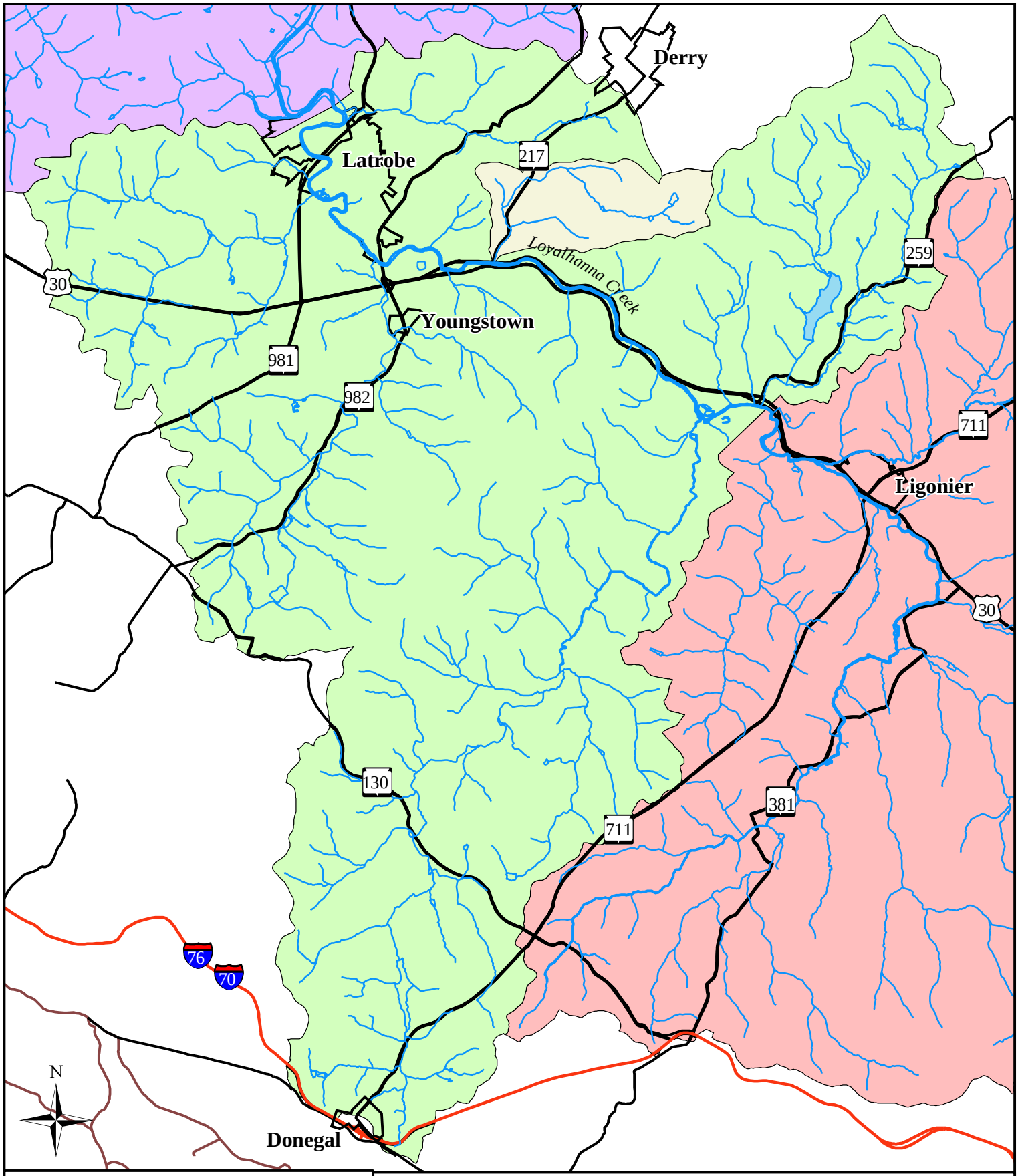
The landscape surrounding the Miller Run Subwatershed shows evidence of past surface and deep mining operations. Flooded deep mine workings exist below the middle portion of the subwatershed. Where Miller Run flows off of Chestnut Ridge, multiple surface mines have been completed. Despite past and current mining, Miller Run shows no evidence of AMD.

Miller Run is classified as a HQ-CWF. For geographic location of this subwatershed, please refer to Map 2.D.1.

Review of Historic Information

PA Fish and Boat Commission (PAFBC)

In 1983, the PAFBC completed a survey of Miller Run to determine if its classification could be upgraded to Exceptional Value (EV). They reported chemical composition changes from the ridge source of the stream to the valley. Exposed limestone increased alkalinity and hardness. The pH, however, remained low. Recorded pH values included 6.4 and 6.6 at two different locations. Invertebrates within the sampled section were not numerous, but sensitive taxa dominated the sample. Only three fish species were collected in the upper portion of the subwatershed—creek chubs, sculpin, and blacknose dace. Close to the mouth, however, brown trout and brook trout were collected. The conclusion of the assessment was that Miller Run should remain designated a HQ-CWF.



Streams
Major Roads
Boroughs and Cities
Miller Run Subwatershed
Middle Section

Miller Run Subwatershed: Overall Location

Map 2.D.1

Western Pennsylvania Conservancy
Watershed Assistance Center

1 0.5 0 1 Miles

PA Department of Environmental Protection (DEP)

Multiple surface mining operations have occurred throughout the Miller Run Subwatershed. Various reports are available for each of those different operations. From 2000 to 2003, three separate operations were completed—one at the extreme headwaters, and two in the middle section. Files regarding those operations are available for reference at the LWA office or at the DEP District Mining Office in Greensburg.

Scarlift Report

The Scarlift Report identified two acidic seeps within the Miller Run Subwatershed. Both were small seeps emanating from failing mine seals and abandoned shafts. Of the two, the more significant seep was found close to Kingston Coal and Stone at the intersection of Route 30 and Route 711. At that site, a number of seals were leaking and emptying into Miller Run. Recommendations for both sites involved improving the seals. Neither seep had a major impact upon Miller Run. The seals have since been repaired and no evidence of those seals was located during the visual assessment.

U.S. Army Corps of Engineers (USACE)

In 2003, field samples were taken by the USACE at multiple sites throughout the Loyalhanna Creek Watershed. One field sample was obtained at the mouth of Miller Run. Most notable was the pH of 5.32. This pH is much lower than any field samples taken during the assessment. In comparison to samples obtained during the visual assessment, this field reading is extremely low. The low reading obtained by the USACE could have been a result of rainfall or error.

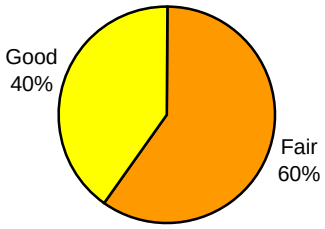
Visual Assessment Summary

Visual Assessment Findings

The Miller Run Subwatershed was assessed in December of 2003. The ground was snow covered and the temperature was moderate. As depicted in Figure 2.D.1, 40% of the stream received a good rating and 60% received a fair rating. The entire subwatershed received an average score of 7.28, which is a fair rating overall.

Two main stem stream segments and three tributaries were assessed. The fair ratings given to the stream segments and tributaries are a direct result of moderate channelization and riparian vegetation degradation. Individual stream ratings are depicted in Map 2.D.2.

Figure 2.D.1: Visual Assessment Ratings for the Miller Run Subwatershed



MILR UNT-2W

CPNF UNT-2W

MILR UNT-1W

217

MILR UNT-1E

MILRB

MIDLOYUNT2N

MILRA

30

MIDLOY-D

MIDLOY UNT3N

MIDLOY UNT4NB

30

Poor
Fair
Good
Major Roads
Miller Run Subwatershed
Middle Section

Western Pennsylvania Conservancy
Est. 1932

Watershed Assistance Center

Miller Run Subwatershed:
Overall Rating

Map 2.D.2

0.4 0.2 0 0.4 Miles

N

Visual Assessment Description

The headwaters of the subwatershed are a series of springs that flow from Chestnut Ridge. At the time of the assessment, Amerikohl was operating a surface mine permit close to the headwater streams. Required samples taken by Amerikohl during mining showed no negative impact from the mining operation. Those required samples were taken in 2003.

The many headwater streams flow into a large reservoir utilized by Kennametal as an industrial water supply. From the reservoir, Miller Run flows though a heavily forested landscape comprised of a mix of pine and hardwoods. The substrate of the stream is a mix of cobble and boulder. Several small waterfalls and pools are formed along the upper portion of the main stem. Halfway through its journey down the ridge, the main stem meanders through the remains of an old reservoir. Very little water is still held within the reservoir boundaries. The old spillway is still intact creating a waterfall and a significant boundary to the movement of fish.

Below the old reservoir, Miller Run maintains a boulder and cobble substrate as it flows through a consistent mix of pine and hardwood. Approximately 500 yards downstream of the old reservoir, the stream changes significantly. At that point, Miller Run flows through a reclaimed surface mine. As the stream swings down close to the road, it gathers flow from a small tributary that also flows through a portion of the reclaimed surface mine. At the time of the assessment, the upper reaches of the mined area had developed significant vegetative growth. However, the bottom area was barren and looks as though mining has just been completed. Despite lack of vegetation in the land surrounding the stream, its riparian buffer remains intact, containing a mix of trees and shrubs. The stream substrate contains fewer boulders and higher amounts of gravel and some silt.

After flowing through the reclaimed surface mine, Miller Run winds into a residential area where a small number of homes are located. Some channelization occurs where Miller Run moves close to the road and residences. The substrate contains fewer boulders, less cobble, and much more gravel and silt.

When Miller Run passes underneath Route 217, it turns south toward the Loyalhanna Creek. It passes behind a residential area and underneath Sportsman's Road. As it moves close to Route 217, it skirts a steep, forested hillside to the west and an automobile junkyard to the east. Passing underneath Route 217 for a second time, Miller Run loses some of the riparian area that has been present throughout most of its length. The loss is due to the fact that Miller Run flows extremely close to Route 217 as it completes its journey to the Loyalhanna Creek. It is also at this point where the stream substrate shows an increase in sediment. In addition, Japanese knotweed is pressent throughout this stretch close to the road.

Miller Run pours into the Loyalhanna Creek directly upstream of the Route 30 Bridge over the Kingston Dam. Its mouth is choked with Japanese knotweed and a large amount of sediment. This is due primarily to the fact that the velocity of Miller Run decreases significantly upon reaching the fast-flowing water below the dam.

Water Quality

Table 2.D.1: Sample Site LWA-9 Miller Run

Date Sampled	pH	Alk. (mg/L)	TSS (mg/L)	TDS (mg/L)	Iron (mg/L)
5/25/04	7.00	34.0	7.0	146.0	<0.06
8/25/04	7.19	52.0	2.0	198.0	<0.06
10/25/04	7.09	51.0	<1.0	243.0	0.1

The mouth of Miller Run was sampled quarterly throughout the assessment. Its water quality indicated very few or no upstream impacts and, therefore, no further samples were taken.

Sample Location: Sample site can be accessed by turning onto Route 217 North from Route 30. Immediately turn right into the Latrobe Water Authority complex. Miller Run passes underneath access road bridge. Sample was taken from the bridge looking upstream.

Conclusions

Despite a history of deep and surface mining, the Miller Run Subwatershed maintains high quality characteristics. Its most significant impacts occur close to the mouth where it encounters residences and roads. It is important that the headwater region of the subwatershed is forested. In the event that the area would be timbered or further mined, the operations should be closely monitored for sediment control.

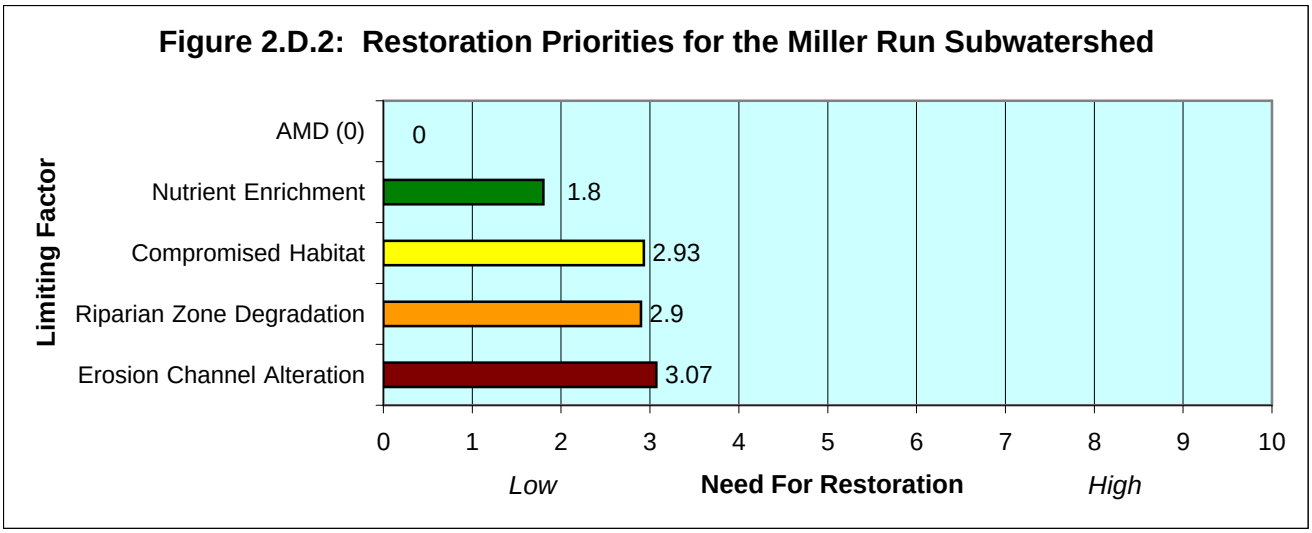
Recommendations

- Work with landowners in the headwater region to ensure continued protection of the waterway.
- Encourage smart, landscape-friendly resource extraction.
- Educate landowners close to the headwaters about the importance of riparian vegetation. In addition, encourage those landowners to use the vegetation as a means of bank stabilization rather than rip rap or other materials.

Overall Restoration Priorities

Figure 2.D.2 illustrates restoration priorities for the entire subwatershed. As indicated, all limiting factors rate low for restoration need. The highest rating was given to erosion and channel alteration. This is a result of impacts found close to the mouth of Miller Run.

Figure 2.D.2: Restoration Priorities for the Miller Run Subwatershed



Restoration Suggestions for Individual Stream Segments

During the time of the assessment there was no visual indication of impaired reaches of stream in this subwatershed. The assessed stream segments did not receive scores identifying limiting factors.

MILR UNT-2W

CPNF UNT-2W

MILR UNT-1W

217

MILR UNT-1E

MILRB

MIDLOYUNT2N

MILRA1

30

MIDLOY-D

MIDLOY UNT3N

MIDLOY UNT4NB

N

Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Miller Run Subwatershed
Middle Section

Watershed Assistance Center

Miller Run Subwatershed: Major Limiting Factor

Map 2.D.3

0.4 0.2 0 0.4 Miles

SECTION 2.E
NINEMILE RUN

Section 2.E

Ninemile Run Subwatershed

General Description

The 19.85 square-mile Ninemile Run Subwatershed is located in the southeast corner of Unity Township. Ninemile Run and its tributaries drain the western slope of Chestnut Ridge and flow through the communities of Lycippus, Whitney, Baggaley, Hostetter, and Youngstown.

The headwaters of Ninemile Run are located just east of the community of Lycippus along Route 130. Multiple spring sources emerge from rocky hillsides to create the main stem. The main stem of Ninemile Run flows north along the base of Chestnut Ridge. It collects flow from fourteen named and unnamed tributaries as it follows Route 982 North toward Latrobe.

Looking upstream at Ninemile Run from its mouth

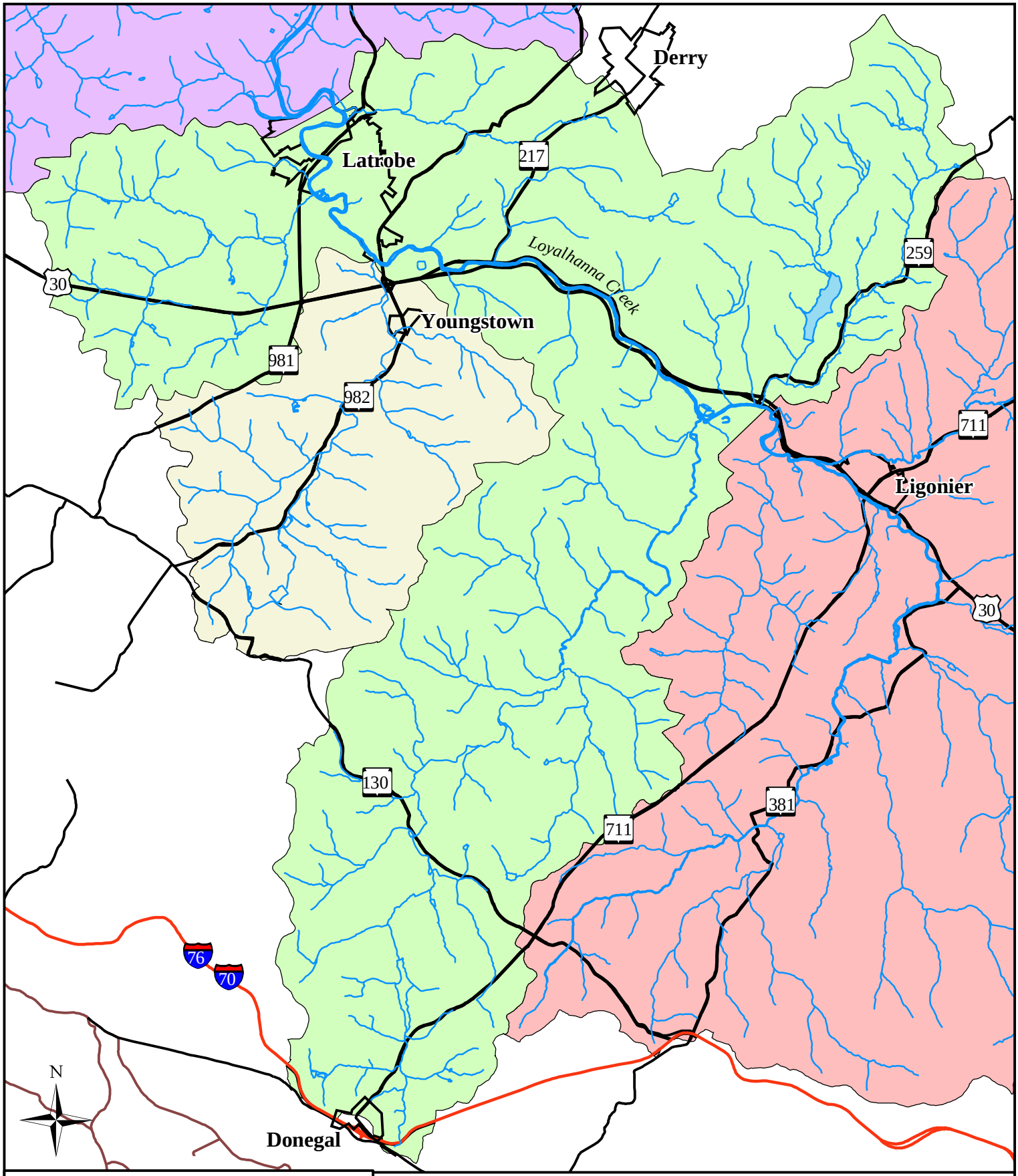
From the headwaters, Ninemile Run immediately flows into a rural landscape comprised of open fields and farmland. It is this rural landscape that dominates the subwatershed until it reaches the Loyalhanna Creek. After leaving Lycippus, Ninemile Run passes through the communities of Whitney, Baggaley and Hostetter. These communities are historic mining areas where coal mining once dominated the landscape. The three towns still show remnants of their historic mining operations. Only one tributary, flowing from Hostetter, shows signs of AMD as a result of past deep mining.

After passing through those small communities, Ninemile Run winds through the Latrobe Country Club. Upon reaching Youngstown, it skirts the major population concentration and flows west around the community. After flowing through Latrobe Rotary Park, Ninemile Run flows underneath Route 30. A large underpass provides passage for the stream as it moves to meet the Loyalhanna Creek main stem. That confluence occurs approximately 1,500 yards downstream of Route 30, and 500 yards downstream of the Route 982 Bridge over the Loyalhanna Creek.

The Ninemile Run Subwatershed is classified as a WWF, with the exception of one tributary, Indian Camp Run. Indian Camp Run, entering Ninemile Run from the east, is classified as a HQ-CWF. Please refer to Map 2.E.1 for the geographic location of this subwatershed.

Review of Historic Information

The Ninemile Run Subwatershed has been, and continues to be, the location of various coal and limestone mines. On its eastern boundary along Chestnut Ridge, there are two Loyalhanna Limestone mines. The limestone mine in Whitney is an operating deep mine, whereas the mine in Baggaley was a surface mine and is no longer in operation. On the subwatershed's western boundary, there are three historic deep coal mines. In the early to mid 1900s, the communities of Whitney, Baggaley, and Hostetter were established because of deep coal mines. Today, evidence of each of those coal mines still exists in the form of coal waste piles, coke ovens, and AMD.



Streams
Major Roads
Boroughs and Cities
Ninemile Run Subwatershed
Middle Section

Ninemile Run Subwatershed: Overall Location

Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center

Map 2.E.1

1 0.5 0 1 Miles

Loyalhanna Watershed Association
Conserve, Protect and Restore Natural Resources

Bituminous Coal Mines of Westmoreland County (website)

A website produced by Raymond A. Washlaski, Ryan P. Washlaski, and Peter E. Starry, Jr. lists the coal mines that were once operational throughout the county. The following deep mines were referenced on the website. Each of them was once in operation within the Ninemile Run Subwatershed.

Mine	Dates of Operation	Last Known Operator	Location
Baggaley Mine (Puritan Mine and Coke Works)	1897 – 1922	HC Frick	Baggaley. Located to the west of Route 982.
Hostetter Mine and Coke Works	1890 – 1962	Jamison Coal & Coke	Located just north of Baggaley west of Route 982 in the community of Hostetter.
Whitney Mine and Coke Works	18891960	Jamison Coal & Coke	North of Baggaley and Hostetter in the community of Whitney.

PA Department of Environmental Protection (DEP)

Various reports from the DEP highlight water quality samples related to surface mines, coal waste pile removal, active limestone mines, and abandoned deep mine areas. The following project files appeared to be significant:

1. Whitney Reclamation Site: A large coal waste pile is being removed from UNT5W, which is located in the community of Whitney. The waste pile is a result of historic coal mining within the community. The pile has been partially removed and is slated for complete removal in the future.
2. Baggaley/Hostetter Site: A large coal waste pile was once located adjacent to UNT3W that flows northeast from Hostetter toward Baggaley to meet the Ninemile Run main stem. The waste pile has been removed; however, waste material is still present under the surface. UNT3W is impacted by seepage and runoff from this area. Samples show high levels of aluminum and significant presence of iron.

More complete information regarding the two above sites can be obtained at the DEP District Mining Office in Greensburg.

Greater Latrobe Senior High School - Capstone Class

Under the advisement of the DEP, a specialty class at the Greater Latrobe Senior High School has been monitoring the water quality of Ninemile Run since 1995. Their goal is to monitor and analyze the overall impact of AMD. That data is available at the LWA office.

PA Fish and Boat Commission (PAFBC)

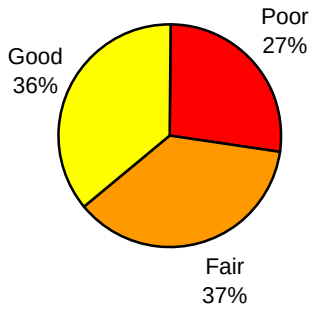
In the spring of 1983, the PAFBC completed a survey of Indian Camp Run. The survey was completed to determine the effect of siltation created by the limestone quarry and a logging operation. The silt problem was corrected and no other problems were noted.

Visual Assessment Summary

Visual Assessment Findings

The visual assessment of the Ninemile Run Subwatershed was completed in the spring of 2004. A total of 43 stream segments were assessed. As depicted in Figure 2.E.1, 36% of the subwatershed received a good rating, 37% received a fair rating, and 27% received a poor rating. An average score of 6.73 was given to the entire subwatershed, which is a fair rating overall.

Figure 2.E.1: Visual Assessment Ratings for the Ninemile Run Subwatershed



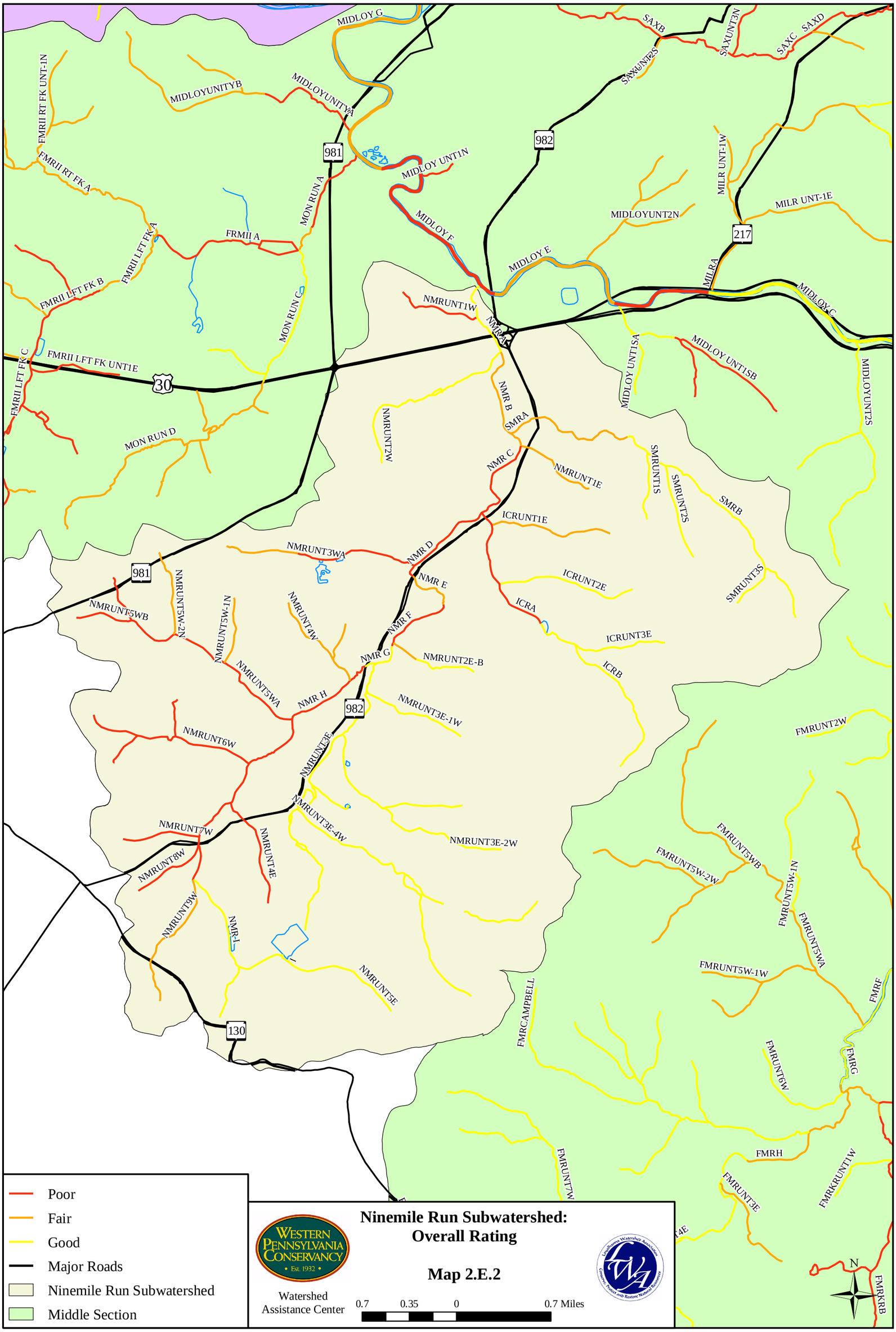
The overall fair rating reflects the impact of riparian vegetation zone degradation and erosion occurring throughout the entire subwatershed. Those impacts were a direct result of population concentrations and agricultural operations found around and adjacent to the stream. Individual stream segment ratings are depicted in Map 2.E.2.

Visual Assessment Description

The headwaters of Ninemile Run originate from two spring sources that meet just north of Lycippus along Route 982. One of the two springs begins in a forested hollow on Chestnut Ridge and flows through Possum Hollow. The stream substrate is comprised primarily of cobble and is surrounded by a mix of pine and hardwoods. The second of the headwater spring sources originates east of Lycippus along Route 130. Unlike the spring flowing through Possum Hollow, this spring begins close to a private residence. It then flows immediately through a culvert under Route 130. Surrounded mostly by forest, it continues on to meet the Possum Hollow spring to form the main stem of Ninemile Run.

After the spring sources converge, the main stem of Ninemile Run flows northwest away from Chestnut Ridge. The main stem passes through a series of old fish hatchery ponds where evidence of channel alteration is apparent. Downstream of the fish hatchery, the stream substrate changes drastically from cobble to primarily silt and gravel. This change is a direct result of four tributaries that are impacted by agricultural operations. Those tributaries enter Ninemile Run north of Lycippus where it passes underneath Route 982.

The first of the four tributaries, UNT9W flows directly through a sheep farm and farm fields. The second, UNT8W flows directly through a housing development and then passes through two fallow fields. As a result of the removal of canopy and streamside vegetation, the substrate of the tributary is composed of silt and mud. UNT7W originates in golf course ponds and flows through grazed fields prior to reaching the main stem of Ninemile Run. Lastly, UNT4E originates in a farm and flows through a grazed area. Combined, the four tributaries deposit noticeable amounts of sediment into the main stem. The impact of the tributaries is compounded as the main stem also meanders through an agricultural operation where livestock have direct access to the stream. With very little canopy cover and limited streamside vegetation, the main stem continues to flow northward.


MIDLOY G
SAXB
SAXUNT3N
SAXC
SAXD
SAXUNT2S
MIDLOYUNITYB
MIDLOYUNITYA
FMRII RT FK UNT-1N
FMRII RT FK A
981
982
MIDLOY UNT1N
MON RUN A
MIDLOY F
MILR UNT-1W
MILR UNT-1E
MIDLOYUNT2N
217
FRMII A
MIDLOY E
MILRA
FMRII LFT FK A
FMRII LFT FK B
MON RUN C
NMRUNT1W
NMRA
MIDLOXC
FMRII LFT FK UNT1E
FMRII LFT FK C
30
MIDLOY UNT15A
MIDLOY UNT15B
MIDLOYUNT2S
NMR B
SMRA
NMRUNT2W
MON RUN D
NMR C
NMRUNT1E
SMRUNT1S
SMRUNT2S
SMRB
ICRUNT1E
NMRUNT3WA
NMR D
NMR E
ICRUNT2E
SMRUNT3S
981
NMRUNT5W-2N
NMRUNT5WB
NMRUNT5W-1N
NMRUNT4W
ICRA
NMR F
ICRUNT3E
NMR G
NMRUNT2E-B
ICRB
NMRUNT5WA
NMR H
982
NMRUNT3E-1W
FMRUNT2W
NMRUNT6W
NMRUNT3E
NMRUNT3E-4W
NMRUNT7W
NMRUNT3E-2W
FMRUNT5WB
FMRUNT5W-2N
FMRUNT5W-1N
NMRUNT4E
NMRUNT8W
FMRUNT5WA
NMRUNT9W
NMRF
FMRUNT5W-1W
FMRF
NMRUNT5E
FMRCAMPBELL
130
FMRUNT6W
FMRG
FMRH
FMRUNT7W
FMRKRUNT1W
FMRUNT3E
FMRKRB
N
Poor
Fair
Good
Major Roads
Ninemile Run Subwatershed
Middle Section
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
Ninemile Run Subwatershed:
Overall Rating
Map 2.E.2
0.7 0.35 0 0.7 Miles

South of Whitney, Route 981 and Route 982 split. Downstream of this intersection, Ninemile Run passes underneath Route 981. It is at this point that UNT6W enters, carrying with it an additional load of sediment. Development is taking place within the area surrounding the tributary and the channel has been altered to accommodate for roads and driveways. Where homes do exist, landowners mow lawns directly to the streambank. The combination of these impacts could eventually result in the substrate becoming choked with silt and gravel.

As Ninemile Run continues north, an unnamed tributary enters from the west. The tributary flows from the community of Whitney, where the presence of homes increases. A refuse pile, from a mining operation once located in Whitney, has been partially removed. At the time of the assessment, the refuse pile had no visible impact upon the stream.

Partially reclaimed refuse pile located in Whitney along UNT5W

It is not until Ninemile Run flows underneath Route 982 again that the substrate becomes less dominated by silt and sediment. It is also at that point where a large tributary, UNT3E, enters the main stem from the east. UNT3E drains a major portion of the west-facing slope of Chestnut Ridge. It also includes flow from a tributary originating at the Whitney Quarry.

Upon passing the intersection with Route 982, the area around Ninemile Run becomes more residential. Residences remain as the stream flows into the community of Baggaley. It is in Baggaley that UNT3W enters the main stem, contributing AMD to the main stem. The AMD emanates from the site of a huge coal waste pile that once occupied a large area of land adjacent to the stream. Iron and aluminum precipitate are noticeable along the length of the tributary. Multiple seeps entering the stream have field pH measurements ranging from 2.9 to 3.2. Despite reclamation of the waste pile in the 1980s, materials remaining on site are still acid-producing and create AMD. Upon reaching the main stem of Ninemile Run, the tributary deposits a plume of aluminum and iron. The downstream impact of the discharge will vary with flow and rainfall. In general, the visual impact dissipates downstream. The Greater Latrobe Senior High School Capstone Class has monitors this stream quarterly. For detailed water chemistry regarding this site, please contact the LWA Office.

Aluminum precipitates where UNT3W enters the main stem of Ninemile Run

As Ninemile Run flows through Baggaley, it is flanked by a road on one side and residences on the other. Trash, sand, silt, and very little cobble are present along the stream substrate. In addition, algal growth is noticeable along the edge of the stream and on the substrate.

Just before leaving the community of Baggaley, Indian Camp Run flows into the main stem from the east. Indian Camp Run is the only HQ-CWF stream within the subwatershed. It originates upon Chestnut Ridge and flows past the old Baggaley limestone mine. At the time of the assessment, the headwaters were in the process of being logged and much sediment was noted throughout. Closer to the mouth of the stream, an acidic tributary enters Indian Camp Run from the southeast. At its mouth, the field pH was 4.6. It is suspected that this could be a result of acid deposition. Close to the mouth, Indian Camp Run is channelized and has only mowed grass for riparian vegetation.

After its confluence with Indian Camp Run, Ninemile Run proceeds through the Latrobe Country Club Golf Course. The main stem is channelized and streambanks are stabilized with rip rap through a majority of the golf course. Canopy cover is extremely limited and absolutely no riparian vegetation is

present. Riparian vegetation and canopy cover return partially as Ninemile Run meanders through the Latrobe Rotary Park. Evidence of past flooding, channelization, and erosion are all apparent throughout this section.

Ninemile Run passes underneath Route 30, approximately 500 yards from the park and immediately west of the Route 982 and Route 30 interchange. It then flows through a floodplain with residences to the west and open field to the east. Canopy cover is significant and adequate throughout this length. The substrate of the stream is a mix of cobble, mud, and silt. Streambanks are extremely muddy, and only the main flowing channel is free of large deposits of sediment.

The confluence of Ninemile Run and the Loyalhanna Creek is located 500 yards downstream of the Route 982 Bridge. At the confluence site, no evidence of upstream AMD impacts is visible.

Water Quality

The mouth of Ninemile Run was sampled regularly throughout the assessment. Water quality indicated very few impacts at the mouth, despite known impacts upstream. Due to existing sample programs taking place within the Ninemile Run Subwatershed, no further water quality samples were taken.

Table 2.E.1 :Sample Site LWA-10
Ninemile Run

Date Sampled	pH	Alk. (mg/L)	Acid. (mg/L)	TSS (mg/L)	TDS (mg/L)	Sulfates (mg/L)	Iron (mg/L)	Mn (mg/L)	Al (mg/L)	Total Coliform (per 100ml)	Fecal Coliform (per 100ml)
5/25/04	7.08	47	- - -	4	136	- - -	<0.06	- - -	- - -	TNTC	50
8/25/04	7.27	73	-67.0	1	- - -	36	<0.06	<0.01	<0.04	- - -	- - -
10/25/04	7.36	91	- - -	1	224	- - -	<0.06	- - -	- - -	- - -	- - -
1/25/05*	Frozen over - unable to sample										
3/31/05*	7.30	43.6	1.80	4.0	- - -	32.8	0.401	0.09	<0.50	- - -	- - -

- - - parameter not sampled

*Sample analyzed by the DEP Bureau of Laboratories

Sample Location: Sample taken 100 feet upstream of the Ninemile Run mouth. Accessed by taking Route 982 North from Route 30. Turn left on to sewage access road prior to Route 982 Bridge.

Conclusions

Extensive agricultural impacts in the headwaters and riparian vegetation degradation throughout the subwatershed create significant impacts to the stream. For a majority of the main stem's length, sediment and silt dominate the stream substrate.

Tributaries draining the west slope of Chestnut Ridge rated higher overall during the visual assessment; however, they were all degraded upon meeting the Ninemile Run main stem. Degradation is caused primarily by removal of riparian vegetation by landowners and from agricultural operations.

It is important to note that despite historic mining activity, Ninemile Run does not show heavy impacts from AMD. The single most devastating impact from AMD is along UNT3W that flows out of Hostetter. Waste material left where an old waste pile was removed still produces AMD. Further restoration and remediation of this site would eliminate all significant AMD sources from the subwatershed.

Recommendations

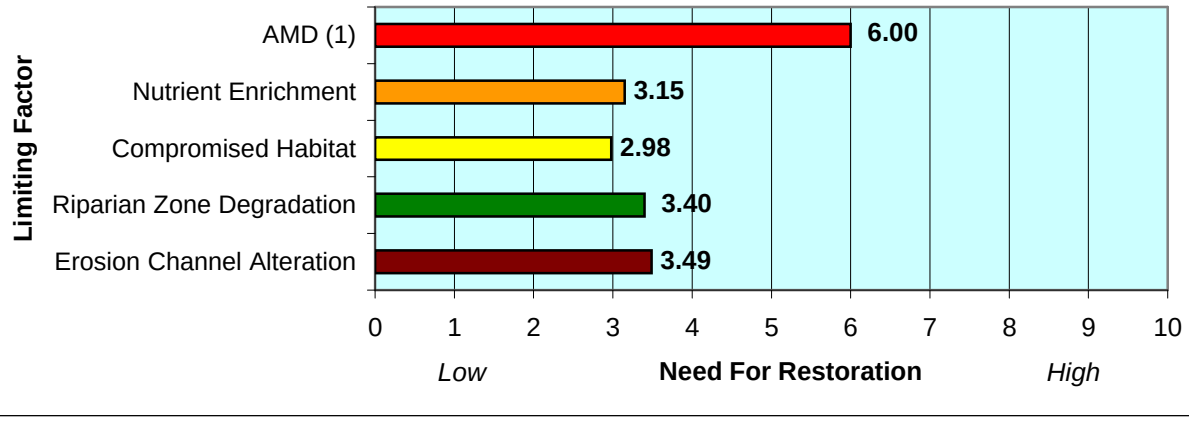
The following recommendations are made for the Ninemile Run Subwatershed:

- Protect headwater streams draining Chestnut Ridge by encouraging landowners to consider available conservation practices.
- Address agricultural non-point source pollution in the headwater region. Work with landowners to install agricultural BMPs.
- Work with landowners within multiple headwater housing developments to install riparian vegetation along streambanks, control storm water, and to use BMPs for lawns. This could include planting trees, plants, and grasses that slow water running off and through the yard, and using the correct amount of fertilizers.
- Work to reclaim and restore the remains of the coal waste pile on UNT3W near Hostetter.
- Encourage Latrobe High School Capstone class to continue monitoring program.
- Provide information to landowners regarding the maintenance of streambank riparian vegetation zones. This can be accomplished through public meetings, workshops, and/or pamphlets.
- Investigate acid deposition on unnamed tributaries draining Chestnut Ridge.

Overall Restoration Priorities

Figure 2.E.2 exhibits overall restoration priorities for the entire subwatershed. As indicated, the limiting factor that received the highest restoration priority rating is AMD. One source of AMD was noted within the subwatershed. It is located along UNT3W, a small tributary flowing from the community of Hostetter. Despite the presence of AMD within UNT3W, the entire Ninemile Run Subwatershed is not heavily impacted by AMD. Water samples taken at the mouth of the stream show little or no presence of metals. Riparian zone degradation and erosion and channel alteration also received higher ratings for restoration priority. Both limiting factors were noted frequently throughout the entire assessment.

Figure 2.E.2: Restoration Priorities for the Ninemile Run Subwatershed



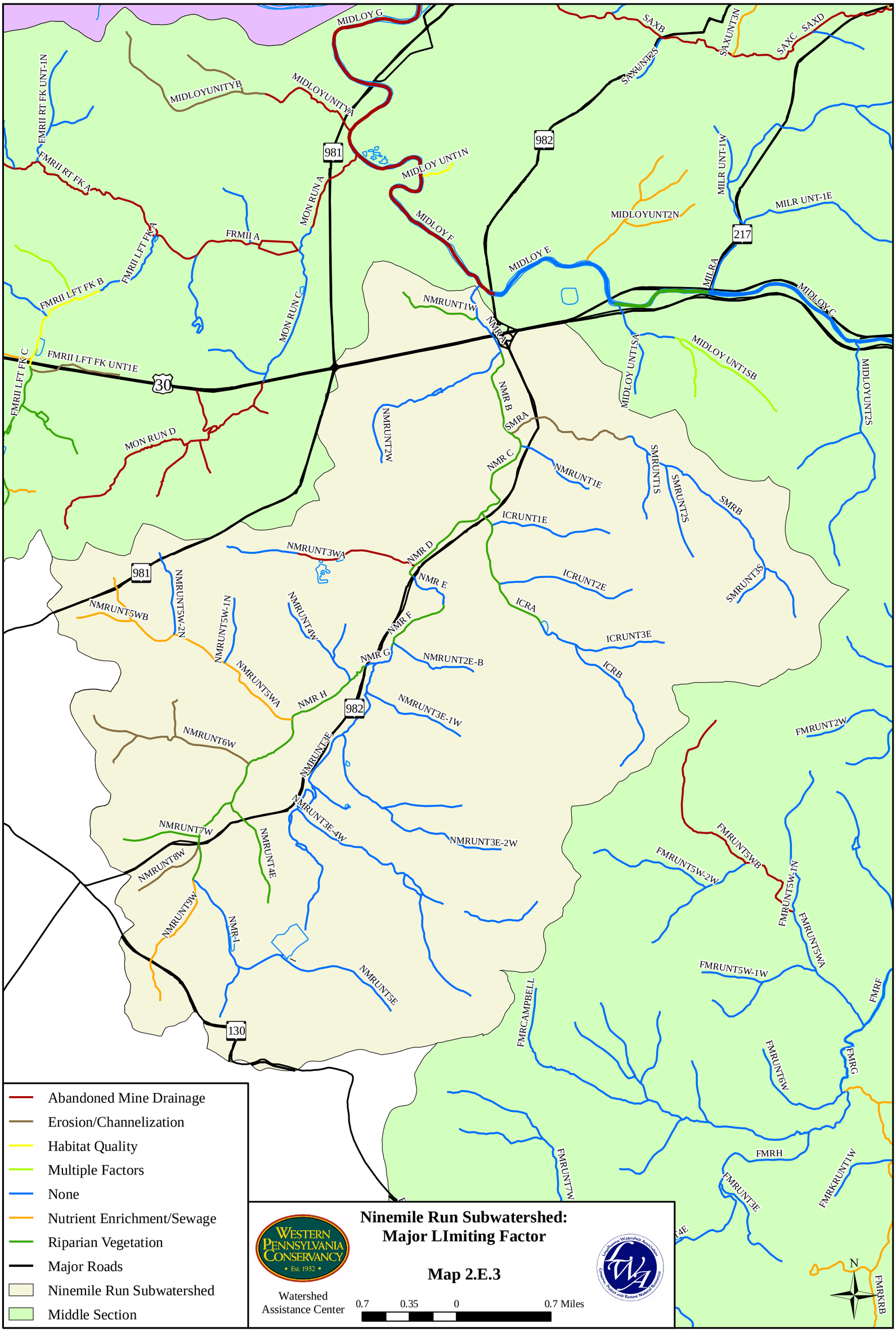
Restoration Suggestions for Individual Stream Segments

Eighteen stream sections within the Ninemile Run Subwatershed received visual assessment scores identifying limiting factors. The limiting factors identified were riparian vegetation degradation, compromised fish and macroinvertebrate habitat, nutrient enrichment, erosion and channel alteration, and AMD. Please refer to Table 2.E.2 and Map 2.E.3 for locations and impact descriptions.

Table 2.E.2: Impacted Stream Segments and Restoration Suggestions for the Ninemile Run Subwatershed

LIMITING FACTOR: Riparian Vegetation Degradation

Stream Segment Name	Description of Impact	Remediation Strategy	Possible Funding Sources	Priority Rating
NMRB *Main stem section that flows through a portion of golf course and through Latrobe Rotary Park.*	Canopy cover is limited, especially through the golf course. Riparian vegetation is scarce along the streambank.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRC *Main stem section that flows through golf course.*	Very few trees throughout the entire section. Riparian vegetation is primarily grass with sporadic shrubs.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRD *Main stem section of stream that flows through community of Baggaley.*	The majority of the section contains no trees. Lawns are mowed directly to the streambank.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRF *Main stem section of stream that winds through a large field.*	There are very few trees present throughout the section. The field is mowed directly to the streambank.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium


MIDLOY G
SAXB
SAXUNT3N
SAXC
SAXD
SAXUNT2S
MIDLOYUNITYB
MIDLOYUNITYA
FMRII RT FK UNT-1N
FMRII RT FK A
981
982
MIDLOY UNT1N
MIDLOY F
MON RUN A
FRMII A
MIDLOYUNT2N
MILR UNT-1W
MILR UNT-1E
217
MILRA
MIDLOY E
MIDLOYXC
FMRII LFT FK A
FMRII LFT FK B
NMRUNT1W
NMRA
MON RUN C
FMRII LFT FK C
FMRII LFT FK UNT1E
30
MIDLOY UNT1SA
MIDLOY UNT1SB
MIDLOYUNT2S
NMR B
SMRA
NMRUNT2W
MON RUN D
NMR C
NMRUNT1E
SMRUNT1S
SMRUNT2S
SMRB
ICRUNT1E
NMRUNT3WA
NMR D
981
NMR E
ICRUNT2E
SMRUNT3S
NMRUNT5W-2N
NMRUNT5WB
NMRUNT5W-1N
NMRUNT4W
NMR F
ICRA
ICRUNT3E
NMR G
NMRUNT2E-B
ICRB
NMRUNT5WA
NMR H
982
NMRUNT3E-1W
FMRUNT2W
NMRUNT6W
NMRUNT3E
NMRUNT3E-4W
NMRUNT7W
NMRUNT3E-2W
FMRUNT5WB
FMRUNT5W-2W
NMRUNT4E
NMRUNT8W
FMRUNT5W-1N
FMRUNT5WA
NMRUNT9W
NMR I
FMRUNT5W-1W
FMRF
NMRUNT5E
FMRCAMPBELL
FMRUNT6W
FMRG
130
FMRH
FMRUNT7W
FMRUNT3E
FMRKRUNT1W
FMRKRB
N
Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Ninemile Run Subwatershed
Middle Section
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
Ninemile Run Subwatershed:
Major LImiting Factor
Map 2.E.3
0.7 0.35 0 0.7 Miles

NMRH *Main stem section that meanders through a field and grazed area.*	The stream section is less than 25% shaded with very few trees present. Streamside riparian vegetation consists primarily of mowed grass with some shrubs. Pastured sheep are present in one area.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. 3. Install agricultural BMPs within stream section impacted by grazing sheep. Possible Partners: WPC, WCD, DEP, FSA, PAGC, NRCS, Unity Township	Local, State, Federal	Low – Medium
ICRA *Tributary to Ninemile Run also called Indian Camp Run. This section of the tributary flows off from Chestnut Ridge into a residential area in Baggaley.*	Throughout the stream section, lawns are mowed directly to the streambank. Very little vegetation is left. Some trees are scattered along the streambank.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. Possible Partners: WCD, DEP, Unity Township	Local, State	Medium *(This is the only HQ-CWF stream within the subwatershed)*
NMRUNT1W *Heavily channelized tributary that is located very close to the mouth of Ninemile Run.*	Because most of the stream is channelized underground, riparian vegetation is not present along its banks. In areas where the stream is above ground, very little vegetation or canopy cover is present.	1. Determine cause of channelization. 2. Determine impact by large rain events when stormwater enters the stream channel. Possible Partners: WCD, DEP, Unity Township	Local, State, Federal	Low – Medium
NMRUNT4E *Small tributary located close to headwaters. Flows from agricultural operation and through backyards.*	There is extremely little riparian vegetation present along the streambank. Only 25% of the stream is shaded by canopy.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. 3. Install agricultural BMPs where tributary flows through agricultural operation. Possible Partners: WPC, FSA, PAGC, NRCS, WCD, DEP, Unity Township	Local, State, Federal	Low – Medium

NMRUNT5WA *Section of medium-sized tributary that drains the community of Whitney. The tributary flows through an area that was once covered by coal refuse. Some coal refuse is still present.*	There is very little vegetation along the streambank. Some shrubs and scattered trees provide minimal shade for the tributary.	1. Educate landowners. 2. Remediate riparian area with tree and shrub plantings. 3. Check into the timeline for the removal of the remaining coal refuse. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRUNT5WB *Headwater section of medium-sized tributary that flows into the community of Whitney.*	Stream flows through open fields and new housing development. Minimal riparian vegetation present. Some trees located streamside through section.	1. Educate landowners. 2. Encourage landowners to improve riparian vegetation and canopy cover. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRUNT5W-3N *Small tributary to UNT5W that flows through open fields.*	Some riparian vegetation and some trees are present through stream length. Amount of vegetation is limited overall.	1. Educate landowners. 2. Encourage landowners to improve riparian vegetation and canopy cover. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRUNT7W *Small tributary located close to the headwaters, which seeps into golf course pond, on through fallow fields, and into grazing operation.*	Riparian vegetation through the golf course section is extremely limited. In addition, through the grazing operation, most streamside vegetation has been grazed by beef cattle. Canopy cover is sparse with very few trees located along the streambank.	1. Educate landowners. 2. Install agricultural BMPs where stream flows through grazing operation in order to encourage re-growth of vegetation. 3. Encourage golf course operators to plant trees and shrubs along the streambank. Possible Partners: WPC, WCD, FSA, PAGC, NRCS, DEP, Unity Township	Local, State, Federal	Medium *(Headwater tributary that should be addressed)*

LIMITING FACTOR: Compromised Fish and Macroinvertebrate Habitat				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
NMRD *Main stem section of stream that flows through community of Baggaley.*	Stream substrate is dominated by silt and sand. Very little habitat or food source available for stream life. Lack of streamside vegetation and canopy cover removes potential food sources as well.	1. Educate landowners. 2. Determine source of silt and sand. 3. Remediate riparian vegetation, which will act as a filter/buffer to sediment entering the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRF *Main stem section of stream that winds through a large field.*	Some silt present within stream substrate. Limited fish cover available due to lack of logs, woody debris, overhanging vegetation, and deep pools. Lack of riparian vegetation dictates availability of these types of habitat.	1. Educate landowners. 2. Remediate riparian vegetation, which will provide fish habitat and food source. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRUNT1W *Heavily channelized tributary that is located very close to the mouth of Ninemile Run.*	Multiple fish barriers present due to channelization through culverts, etc. Habitat and food source limited by lack of vegetation surrounding the stream or limited ability to enter stream channel. Stream substrate is comprised mainly of concrete and sand.	1. Determine reason for stream channelization. 2. Explore options to improve stream quality. 3. Determine impact by large rain events when storm water enters the stream channel. Possible Partners: WCD, DEP, Unity Township	Local, State, Federal	Low – Medium

NMRUNT4E *Small tributary located close to headwaters. Flows from agricultural operation and through residential backyards.*	Stream substrate is heavily embedded and dominated by mud. Very little fish cover or food source is available throughout the stream. Culverts and pipes used to channelize the stream act as fish barriers.	1. Educate landowners. 2. Install agricultural BMPs. 3. Remediate riparian area throughout the length of the stream to act as a buffer/filter for sediment entering the stream channel. Possible Partners: WPC, WCD, PAGC, DEP, Unity Township	Local, State, Federal	Low – Medium
NMRUNT6W *Small tributary located close to headwaters. Runs through forested riparian area with fields on either side.*	Stream substrate comprised primarily of silt. Cobble and gravel are 80% embedded. Fish barriers exist where the tributary is channelized under the road and/or driveways.	1. Determine source of sediment load. 2. Educate landowners. Possible Partners: WCD, DEP, Unity Township	Local, State	Low
NMRUNT7W *Small tributary located close to the headwaters which seeps into golf course pond, on through fallow fields, and into grazing operation.*	Stream substrate is mostly mud and is 100% embedded. Golf course and agricultural operation contribute large sediment loads to the stream. Lack of riparian vegetation.	1. Educate landowners. 2. Address lack of riparian vegetation and canopy cover. 3. Install BMPs within agricultural operations. Possible Partners: WPC, WCD, , PAGC, DEP, Unity Township	Local, State, Federal	Medium *(Tributary located close to headwaters)*
NMRUNT8W *Small tributary located close to the headwaters. Begins within new housing development and then flows through two fallow fields.*	Stream substrate is comprised primarily of silt and mud. Fish barriers exist throughout the length of tributary as it is channelized underground and piped.	1. Determine reason for stream channelization. 2. Work with housing development to improve stream quality through riparian vegetation remediation. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium

LIMITING FACTOR: Erosion and Channel Alteration				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
NMRB *Main stem section that flows through a portion of golf course and through Latrobe Rotary Park.*	Eroding streambanks along stretch of stream. Mostly outside bends. Through golf course, streambank has been stabilized with rip rap.	1. Educate landowners. 2. Work with landowners to bolster streambanks against erosion with riparian vegetation planting. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRD *Main stem section of stream that flows through community of Baggaley.*	Streambanks are steep slopes and riprap has been used to stabilize. In addition, it appears that the stream channel has been straightened through the section.	1. Educate landowners. 2. Encourage landowners to plant trees and shrubs along the streambanks to support and strengthen, rather than use riprap or other methods. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRH *Main stem section that meanders through a field and grazed area.*	Grazing in and around the stream has impacted streambanks. Erosion is apparent through the whole section. Lack of riparian vegetation exacerbates erosion.	1. Educate landowners. 2. Install agricultural BMPs to address erosion and riparian vegetation degradation. Possible Partners: WPC, WCD, FSA, PAGC, NRCS, DEP, Unity Township	Local, State, Federal	Medium *(This section is located close to the headwater region)*

ICRA *Tributary to Ninemile Run, also called Indian Camp Run. This section of the tributary flows off from Chestnut Ridge into a residential area in Baggaley.*	The stream has been heavily channelized by landowners and for the road. Significant erosion on outside bends and through residential backyards. Lack of riparian vegetation exacerbates erosion.	1. Educate landowners. 2. Encourage landowners to revegetate streambanks in order to decrease erosion. 3. Determine reason for channelization of the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Medium *(This is the only HQ-CWF stream within the subwatershed)*
SMRA *Tributary to Ninemile Run, also called Sawmill Run. This section of the tributary flows through a residential area.*	The stream channel is rip-rapped extensively. Retaining walls are also present throughout the stream length. Erosion is present throughout the section.	1. Develop strategy to address erosion along stream section. Should include survey of upstream conditions. 2. Educate landowners. 3. Encourage landowners to plant streamside vegetation. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRUNT1W *Heavily channelized tributary that is located very close to the mouth of Ninemile Run. Flows through residential area, sometimes underground.*	A majority of the stream is channelized underground. Some stormwater also enters stream channel. Where the stream is above ground, erosion is severe.	1. Determine reason for stream channelization. 2. Explore options to improve stream quality. 3. Determine impact by large rain events when stormwater enters the stream channel. 4. Where stream is above ground, improve riparian vegetation and stabilize streambanks. Possible Partners: WCD, DEP, Unity Township	Local, State	Low

NMRUNT3WA *Section A of a small tributary that flows from the community of Hostetter. It is surrounded by scrubby forest and a reclaimed refuse pile.*	Erosion is present throughout the entire length of this stream section. The stream has also been moderately stabilized.	1. Educate landowners. 2. Investigate upstream causes of erosion. Possible Partners: WCD, DEP, Unity Township	Local, State	Low
NMRUNT3WB *Section B of a small tributary. Section begins within new housing development at headwaters and flows through residential area.*	The stream has been channelized, especially in headwaters through new housing development.	1. Educate landowners. 2. Encourage landowners within the housing development to install alternative methods of streambank stabilization, including riparian vegetation. Possible Partners: WCD, DEP, Unity Township	Local, State	Low
NMRUNT4E *Small tributary located close to headwaters. Flows from agricultural operation and through residential backyards.*	The stream has been buried and channelized. This occurs primarily through the residential areas.	1. Educate landowners. 2. Remove channelization and work with landowners to install alternative methods of erosion control along the streambanks. Possible Partners: WCD, DEP, Unity Township	Local, State	Low – Medium
NMRUNT5WA *Section of medium-sized tributary that drains the community of Whitney. The tributary flows through an area that was once covered by coal refuse. Some coal refuse is still present.*	The stream substrate is dominated by silt and is nearly 100% embedded. Substrate material is suspected runoff from surrounding refuse pile and field.	1. Determine source of sediment. 2. Continue to remove and remediate coal refuse pile surrounding the stream. Possible Partners: WCD, DEP, Unity Township	Local, State, Federal	Medium *(Removal of coal refuse material is an important priority)*

NMR5WB *Headwater section of medium-sized tributary that flows into the community of Whitney.*	Stream substrate dominated by silt. Substrate material is suspected runoff from housing development located within the headwaters of the tributary.	1. Educate landowners. 2. Address sediment source in headwaters from housing development. Possible Partners: WCD, DEP, Unity Township	Local, State	Low
NMRUNT5W-3N *Small tributary to UNT5W that flows through open fields.*	Stream substrate is heavily embedded with silt. This indicates runoff from surrounding fields is carrying sediment to the stream.	1. Educate landowners. 2. Address sediment load by creating a vegetative buffer along the streambank that can catch sediment prior to entering the stream. Possible Partners: WPC, WCD, DEP, NRCS, Pheasants Forever, Unity Township	Local, State, Federal	Low
NMRUNT6W *Small tributary located close to headwaters. Runs through forested riparian area with fields on either side.*	The stream has been altered for the passage of the road and some culverts are present. The streambanks are relatively stable, with some areas of erosion present. The substrate of the stream is 80% embedded and dominated by silt.	1. Address sediment load by improving vegetative buffer along the streambank. 2. Determine status of surrounding fields and explore possibility of planting grasses capable of decreasing soil erosion. Possible Partners: WPC, WCD, DEP, NRCS, Pheasants Forever, Unity Township	Local, State, Federal	Medium *(Tributary is located close to the headwaters)*

NMRUNT7W *Small tributary located close to the headwaters which seeps into golf course pond, on through fallow fields, and into grazing operation.*	The stream substrate is heavily embedded with mud, indicating runoff from the surrounding landscape. Through the agricultural operation, some channelization is evident, as is a small amount of erosion.	1. Determine the source of sediment load. 2. Address sediment load by encouraging landowners to plant streamside vegetation. 3. Work with golf course to eliminate possible sediment load from course. Possible Partners: WPC, WCD, NRCS, DEP, Unity Township	Local, State, Federal	Medium *(Tributary located close to the headwaters)*
NMRUNT8W *Small tributary located close to the headwaters. Begins within new housing development and then flows through two fallow fields.*	The stream substrate is dominated by silt and mud. It has been buried and channelized in the headwater area. Runoff from housing development and fields almost certain to be adding sediment load.	1. Determine cause for burying stream underground in the housing development. 2. Address possible sediment load from housing development and fallow fields by encouraging landowners to plant streamside vegetation. Possible Partners: WCD, DEP, Unity Township	Local, State, Federal	Medium *(Tributary located close to headwaters)*
LIMITING FACTOR: Nutrient Enrichment				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
NMRUNT3WA *Section A of a small tributary that flows from the community of Hostetter. It is surrounded by scrubby forest and a reclaimed refuse pile.*	Algal growth and macrophytes noted throughout the stream section. Could have been due to acidic mine drainage seeps entering the stream in multiple areas.	1. Remediate source of mine drainage seeps entering the stream. The source is most likely the remains of a large coal refuse pile that was reclaimed. Possible Partners: DEP	State, Federal	Medium – High *(This is the only source of mine drainage within the subwatershed)*

NMRUNT3WB *Section B of a small tributary. Section begins within new housing development at headwaters and flows through residential area.*	Significant algal growth noted. Stream substrate contains algae and macrophytes. Source of nutrient enrichment not known.	1. Determine nutrient enrichment source in order to develop course of action. Possible Partners: DEP, WCD	State	Low
NMRUNT4E *Small tributary located close to headwaters. Flows from agricultural operation and through residential backyards.*	A lot of algal growth found along the stream substrate. Livestock have access to the stream.	1. Educate landowners. 2. Install agricultural BMPs to remove livestock from the stream. 3. Assist farmer in developing a more effective management plan for nutrients. Possible Partners: WPC, WCD, FSA, PAGC, NRCS, DEP, Unity Township	Local, State, Federal	Medium *(Tributary is located close to the headwaters)*
NMRUNT5WA *Section of medium-sized tributary that drains the community of Whitney. The tributary flows through an area that was once covered by coal refuse. Some coal refuse is still present.*	Nutrient growth noted along the stream substrate. The water had an unpleasant odor during visual assessment, although no drainage pipes were found. Suspected source of nutrient growth is failing septic systems along and around the stream.	1. Educate landowners. 2. Confirm source of nutrient loading. 3. Encourage landowners to utilize BMPs for managing septic systems. Possible Partners: DEP, Unity Township, PSCE	Local, State	Low
NMRUNT5WB *Headwater section of medium-sized tributary that flows into the community of Whitney.*	Water and substrate appearance cloudy and murky. Serious nutrient growth located on substrate material. Suspected source of nutrient growth is failing septic systems along and around the stream.	1. Educate landowners. 2. Confirm source of nutrient loading. 3. Encourage landowners to utilize BMPs for managing septic systems. Possible Partners: DEP, Unity Township, PSCE	Local, State	Low

NMRUNT6W *Small tributary located close to headwaters. Runs through forested riparian area with fields on either side.*	Significant algal growth found throughout stream substrate.	1. Determine source of nutrient loading. Possible Partners: DEP, Unity Township	Local, State	Low
NMRUNT7W *Small tributary located close to the headwaters, which seeps into golf course pond, on through fallow fields, and into grazing operation.*	Algal growth found throughout stream substrate. Suspected source is the combination of fertilizers used at the golf course and manure from the grazing operation.	1. Educate landowners. 2. Work with golf course to better manage application of fertilizers. In addition, encourage riparian zone remediation so that plants and trees located along the streambank can filter sediments and other materials before they enter the stream. 3. Install BMPs through agricultural operation to eliminate the impact of livestock upon the stream. Possible Partners: WPC, WCD, FSA, PAGC, NRCS, DEP, Unity Township	Local, State, Federal	Medium *(Tributary is within the headwater region)*
NMRUNT9W *Headwater tributary that flows through a farm.*	Livestock have direct access to the stream, thus enabling the addition of nutrients.	1. Educate landowners. 2. Install agricultural BMPs to eliminate the impact of livestock upon the stream. Possible Partners: WPC, WCD, FSA, PAGC, NRCS, DEP, Unity Township	Local, State, Federal	Medium – High *(Headwater tributary)*

LIMITING FACTOR: Abandoned Mine Drainage				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
NMRUNT3WA *Section A of a small tributary that flows from the community of Hostetter. It is surrounded by scrubby forest and a reclaimed refuse pile.*	The entire stream section exhibits signs of AMD. Multiple orange and white seeps enter the stream. Field pH readings ranged from 2.9 to 3.0. Aluminum precipitate is visible where UNT3W enters the main stem of Ninemile Run. AMD is known to be seeping from the remains of a coal refuse pile removed in the 1980s.	1. Remediate seeps by further reclamation of coal refuse or capture of flow from the seeps. 2. Educate landowner and surrounding landowners about the AMD problem and potential solution. Possible Partners: DEP, OSM, WCD, Latrobe High School Capstone Class, Unity Township	State, Federal, Private	High *(This is the only significant AMD source within the entire subwatershed)*

SECTION 2.F
MONASTERY RUN

Section 2.F

Monastery Run Subwatershed

General Description

The 12.69 square-mile Monastery Run Subwatershed is located in the middle of Unity Township, just west of the City of Latrobe. It is composed of three major tributary branches, the **Monastery Run Main Stem**, **Fourmile Run Right Fork**, and **Fourmile Run Left Fork.** [1]

Monastery Run as it passes underneath Route 981 North in Latrobe

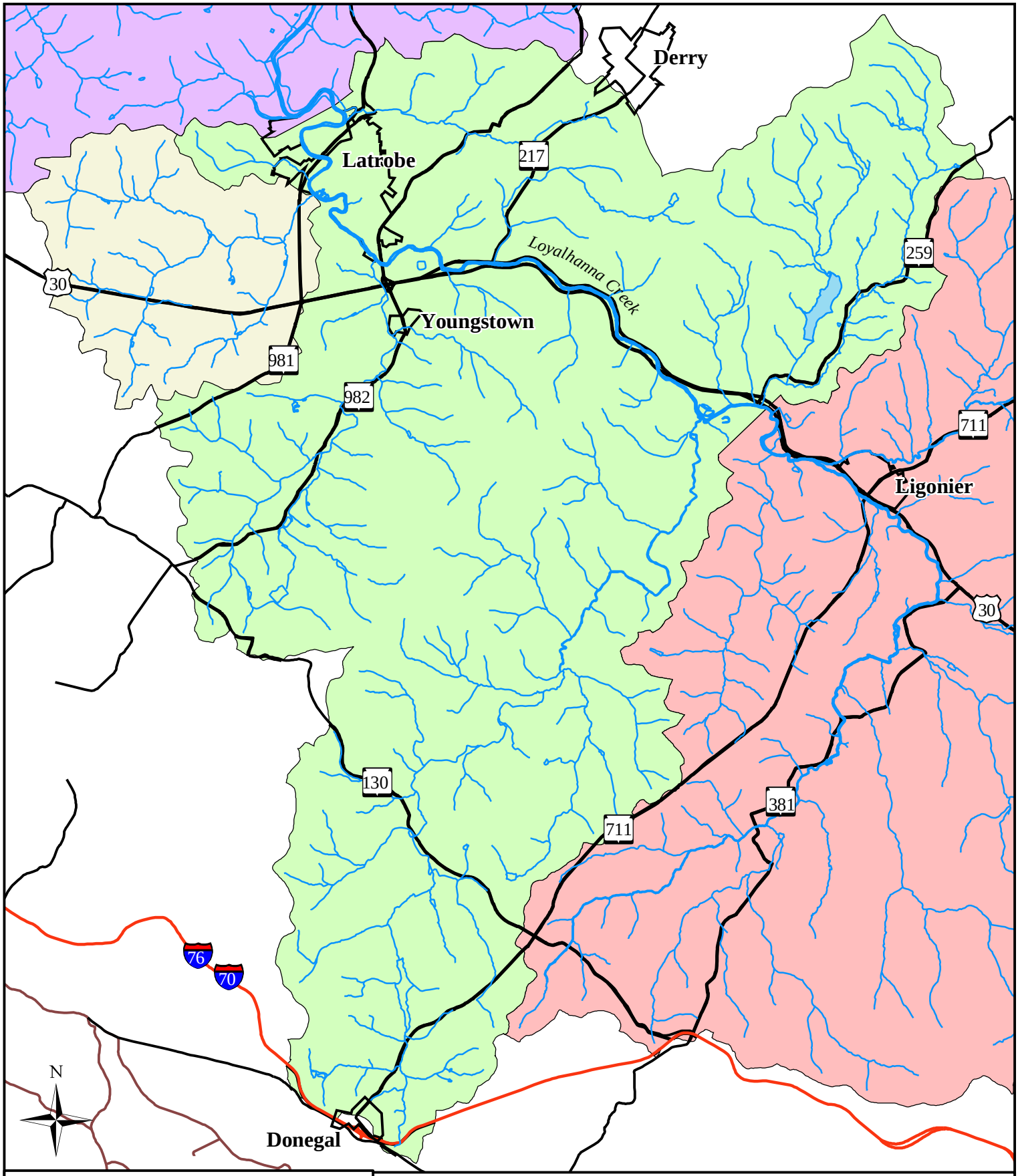
The **Monastery Run Main Stem** originates south of Route 30 and immediately southwest of the Latrobe airport. Its headwaters are located in a small, forested hollow. Monastery Run flows northeast along the base of a valley surrounded by hardwood forest and multiple row crops and hayfields. As it meanders toward Route 30, its substrate is dominated by some cobble, gravel, and silt.

After passing underneath Route 30, Monastery Run flows through the small community of St. Vincent Shaft. Just below Saint Vincent College, Monastery Run forms a confluence with Fourmile Run, a large tributary entering from the west. Fourmile Run contains AMD and immediately mixes with Monastery Run turning it orange with iron oxide precipitate. Finally, Monastery Run flows past the community of Dorothy, an historic mining town. It then flows underneath Route 981 and turns to travel 1,000 feet to its mouth. Monastery Run meets the Loyalhanna Creek across from the southern end of Legion Keener Park in downtown Latrobe.

The two branches of Fourmile Run originate to the west of the Monastery Run main stem. The headwaters of **Fourmile Run Left Fork** begin east of Marguerite upon a hillside dominated by oak and other hardwood trees. As it flows northward, the Fourmile Run Left Fork winds through a rural landscape surrounded by open hay fields and pasture. Very few residences are located along the streambank. The Fourmile Run Left Fork then passes underneath the intersection of Route 30 and Beatty Road at the Beatty Crossroads stoplight. Impervious surfaces, businesses, and homes crowd the Fourmile Run Left Fork main stem and the tributaries located close to this intersection. The Fourmile Run Left Fork flows past the Unity Township municipal complex, the Quikcrete facility, and finally meets the Fourmile Run Right Fork at the intersection of Beatty Road and Monastery Road. In its journey, Fourmile Run Left Fork gathers flow from seven small, unnamed tributaries entering from both east and west.

A heavily surface-mined hillside is where the **Fourmile Run Right Fork** originates. It flows from underneath a major active railroad, east of Donohoe. As it flows east toward the community of Beatty, a canopy of hardwood trees surrounds Fourmile Run Right Fork. The main stem parallels Beatty Road, winding by few residences and one agricultural operation. After passing underneath the railroad for a second time, Fourmile Run Right Fork meets the Fourmile Run Left Fork. Immediately downstream of the confluence of the two branches, the main stem flows past a large AMD passive

[1] Fourmile Run referred to here is a tributary to Monastery Run. There is another Fourmile Run Subwatershed located in the upper section.



Monastery Run Subwatershed: Overall Location

Map 2.F.1

Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center

1 0.5 0 1 Miles

Loyalhanna Watershed Association
Conserve, Protect and Restore Natural Resources

treatment system. Treating anywhere from 500 to 6,000 gpm of AMD, the wetlands extend for approximately one-half mile downstream. Despite effective treatment of the AMD, Fourmile Run still flows orange due to seasonal system overflow and multiple seeps. Fourmile Run meets the main stem of Monastery Run downstream of the treatment systems, close to the outflow from St. Vincent Lake on Monastery Road.

Review of Historic Information

Coal mining took place throughout the Monastery Run Subwatershed during the early and mid - 1900s. At least three abandoned deeps mines and multiple surface mines are located within the subwatershed. The deep mines are near Saint Vincent College and the community of Beatty. Major surface mining took place mostly within the Fourmile Run Right Fork along the railroad corridor. Despite extensive mining throughout the subwatershed, it contains one minor and two major discharges. Both of the discharges are currently being treated by passive wetland systems.

Scarlift Report

Six discharges were identified within the Monastery Run Subwatershed during fieldwork for the Scarlift Report. The discharges varied in flow, chemistry, and type. Today, only three of those discharges are still contributing AMD to Monastery Run. Please see the chart below for a complete list of those discharges.

Monastery Run Subwatershed Discharges Catalogued During Scarlift		
Scarlift Discharge Number	**Description of Discharge and Location**	**Current Status**
5352	Near Unity Township building. Originated from abandoned deep mine entrance.	Not Flowing
5353	In the headwaters of the Fourmile Run Right Fork. Originating from an old strip cut.	Now referred to as the Buffenmyer Discharge. Flows at approximately 2-5 gpm. It does not heavily impact the stream.
5359	Six-inch pipe flowed into Fourmile Run upstream of St.Vincent Lake.	Not Flowing
5360	Borehole drilled into the bed of Fourmile Mile Run just downstream of where the right and left forks merge.	Flowing at variable rates, this discharge flows into Wetland #1 of the Saint Vincent College (SVC) Passive Treatment System.
5361	Artesian flow located upstream of St.Vincent Lake.	Flowing into Wetland #2 of the SVC Passive Treatment System.
5362	Artesian flow located along the streambank of Fourmile Run adjacent to St.Vincent Lake.	It is suspected that this discharge is the “Bubbler,” which has been sealed and relocated. Discharging water from the Bubbler is being treated in Wetland #3 of the SVC Passive Treatment System.

Saint Vincent College

Three passive treatment wetlands are located on 20 acres located along Gristmill Road near Saint Vincent College. The college operates and maintains the AMD passive treatment system that treats AMD from two sources. Combined, the three wetlands remove more than 260 pounds of iron oxide every day. This reduces the iron content of the discharges by more than 90%. In addition, the system significantly improves water quality in Fourmile Run, Monastery Run, and the Loyalhanna Creek.

DEP Bureau of Abandoned Mine Reclamation (BAMR) constructed Wetland #1 in 1998. It was constructed within an existing wetland that was created by a number of seeps and discharges, the largest of which was an artesian flow that wells up at the beginning of the system. Before treatment, the average water quality is: pH 6.1, total iron 95.7 mg/L, manganese 3.38 mg/L, and aluminum 0.33 mg/L. The average water quality after treatment is: pH 6.7, total iron 2.3 mg/L, manganese 2.3 mg/L, and aluminum 0.30 mg/L.

USDA Natural Resources Conservation Service (NRCS) constructed the 7.5-acre Wetland #2 in 1998. The average water quality after treatment is: pH 6.8, total iron 6.3 mg/L, manganese 2.7 mg/L, and aluminum 0.37 mg/L. In 1999, Wetland #2 and Wetland #1 were connected in order to treat high flow into Wetland #1 during the winter and spring months.

Wetland #3 was constructed in 1997. It treats water that originates from the "Bubbler," a borehole drilled to relieve basement flooding in the 1960s. The Bubbler was relocated in 2002 bringing it closer to the treatment system. Water from the Bubbler is also piped into Wetland #2 during times of high flow in order to allow for more effective overall treatment. The average water quality after treatment is: pH 6.7, total iron 2.3 mg/L, manganese 2.3 mg/L, and aluminum 0.30 mg/L. Since 1993, Saint Vincent College has monitored the water quality of Fourmile Run and Monastery Run. Recent data shows that the wetlands remove more than 260 pounds of iron oxide daily. The water quality information is available online at http://facweb.stvincent.edu/EEC.

The AMD passive treatment system at Saint Vincent College is the site of an environmental education program. The program was designed to educate students and adults about AMD. To date, the program has shared information with thousands of individuals from throughout the region.

DEP Monastery Run TMDL

Fieldwork for the Monastery Run TMDL was completed in 2003. The TMDL report for Monastery Run was approved and released in 2005. Monastery Run, upstream of the confluence with Fourmile Run, is attaining its uses according to the Clean Water Act criteria. Downstream of the Fourmile Run confluence, it is listed as impaired on the PA Section 303(d) list. The TMDL for Fourmile Run consists of load allocations to two sampling stations along the stream. Fourmile Run above the wetland treatment system at Saint Vincent College is attaining its uses. Downstream of the wetland system, Fourmile Run is currently on the PA Section 303(d) list for metal impairments.

The entire TMDL report can be viewed on the PA DEP website. The report includes sample data from sites along Fourmile Run and Monastery Run.

PA Department of Environmental Protection (DEP)

Various reports from the DEP highlight water quality samples related to surface mines throughout the subwatershed. At the time of this report, there were no active coal mines within the Monastery Run Subwatershed. More complete information can be obtained at the DEP District Mining Office in Greensburg.

U.S. Army Corps of Engineers (USACE)

The USACE completed a water quality assessment at the mouth of Monastery Run in 2002. During that assessment the following water quality was obtained: pH 6.6 and total iron 2.58 mg/L. The purpose of the assessment was to gauge overall water quality throughout the entire Loyalhanna Creek Watershed.

Saint Vincent College Summer Institute

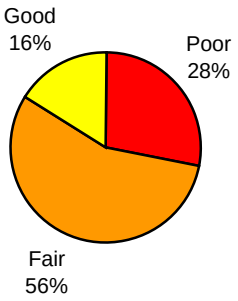
Saint Vincent College students have completed multiple studies regarding water quality. Published studies can be obtained through the LWA or Saint Vincent College. Overall conclusions show a decrease in water quality due to mine drainage entering Fourmile Run and subsequently Monastery Run.

Visual Assessment Summary

Visual Assessment Findings

The visual assessment of Monastery Run was completed in the winter and early spring of 2004. A total of 25 stream segments were assessed. As depicted in Figure 2.F.1, 16% of the subwatershed received a good rating, 56% received a fair rating, and 28% received a poor rating. An average score of 6.37 was given to the entire subwatershed, which is a fair rating overall. The overall fair rating reflects the impact of AMD found in the lower portion of the subwatershed. In addition to AMD impacts, the Monastery Run subwatershed also exhibits poor riparian vegetation, erosion, and high levels of embeddedness. Individual stream segment ratings are depicted in Map 2.F.2.

Figure 2.F.1: Visual Assessment Ratings for the Monastery Run Subwatershed

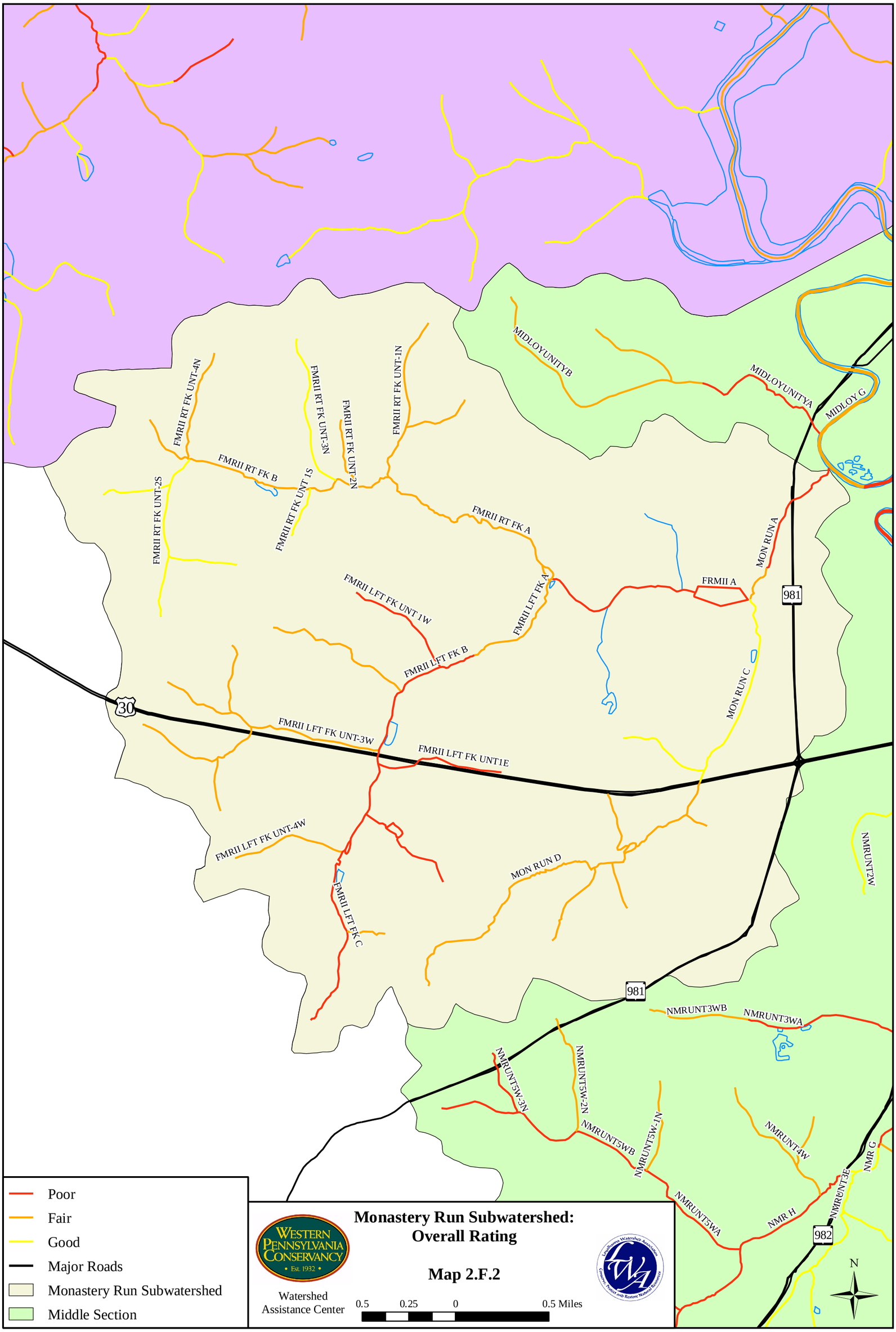


Visual Assessment Description

Monastery Run Main Stem

The headwaters of Monastery Run originate within a small, forested hollow and immediately emerge into an area surrounded by fields. Both hay and corn are present. The Monastery Run main stem is lined with some trees and excessive multiflora rose. As the stream flows north, it contains a substrate composed primarily of gravel and silt. It is suspected that surrounding fields contribute significant amounts of sediment to the Monastery Run substrate. In addition, the Monastery Run main stem flows past the Arnold Palmer Regional Airport. Recently expanded, the airport contains multiple impervious surfaces that possibly drain to Monastery Run.

Upon passing underneath Route 30, near the community of St.Vincent Shaft, Monastery Run develops more canopy cover and streamside vegetation. Despite this increased buffer, the substrate of the stream continues to gather large amounts of silt. Runoff from Route 30 could be a major contributor of


MIDLOYUNITYB
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MON RUN C
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NMRUNT5W-1N
NMRUNT4W
NMR G
NMRUNT3E
NMR H
NMRUNT5WA
982
N
Poor
Fair
Good
Major Roads
Monastery Run Subwatershed
Middle Section
Monastery Run Subwatershed:
Overall Rating
Map 2.F.2
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
0.5 0.25 0 0.5 Miles

silt and other sediment particles.

The Monastery Run main stem meets Fourmile Run, a major tributary, downstream of Saint Vincent College. At the confluence, flow from Fourmile Run turns Monastery Run orange due to iron oxide precipitate. Monastery Run remains cloudy and orange as it continues to flow north toward Latrobe and the Loyalhanna Creek. Despite the major impact from AMD, Monastery Run maintains an acceptable canopy and riparian vegetation zone. Where Monastery Run flows underneath Route 981 in Latrobe, high eroding streambanks have been stabilized with rip rap. Approximately 1,000 feet downstream of the Route 981 Bridge, Monastery Run meets the Loyalhanna Creek. Iron oxide staining and precipitate are deposited into the Loyalhanna Creek and are visible downstream. Prior to the installation of treatment systems upstream, Monastery Run created a more significant impact than what currently exists. More than 90% of suspended metals are being removed from upstream discharges flowing into Fourmile Run.

Fourmile Run Left Fork Main Stem

The Fourmile Run Left Fork begins with a short journey through a forested hollow. It then flows into a region surrounded by agricultural operations. In a few places, cows have direct access to the stream. The substrate is dominated by gravel and silt and contains algae growth. When the left fork flows underneath Route 30, the landscape surrounding the stream changes. Land use changes, and fields are replaced by roads, parking lots, and multiple businesses. Route 30 and other paved roads have a visible impact upon the substrate of the stream indicated by an increase in gravel and other sediment particles.

As the Fourmile Run Left Fork continues to flow north from Route 30, it passes through a residential area. An increase in algal growth and the presence of discharging pipes points toward suspected sewage impacts. It appears that the stream has been channelized throughout this section. Upon investigation, LWA found that the channelization was completed in order to prevent the stream from disappearing and flowing into the abandoned mines located directly underneath the streambed.

Fourmile Run Left Fork Unnamed Tributaries

Seven unnamed tributaries flow into the left fork main stem. A majority of those tributaries flow through areas containing active agricultural operations. UNT3W is the most heavily impacted by agriculture as dairy cows have direct access to the stream. The action of the animals has created erosion and heavy algal growth within the stream substrate.

Fourmile Run Right Fork Main Stem

Where the Fourmile Run Right Fork emerges from a forested hillside, the substrate of the stream is ink black. The cobble-dominated substrate is covered with black algal growth and slightly embedded in silt. Despite extensive investigation and sampling, the source of the black color is unknown to date. As the right fork flows east, it parallels the railroad tracks. Very few residences are present and streamside and riparian vegetation, consisting primarily of multiflora rose, is plentiful. Close to the community of Beatty, Fourmile Run Right Fork meanders through a small farm. Some cows have access to the stream, but there is no evidence of erosion. Streamside riparian vegetation through the farm is minimal. Not until reaching the confluence with Fourmile Run Left Fork does the black coloration disappear. It is most prevalent within the headwaters, but still significant throughout the entire right fork main stem length.

Fourmile Run Right Fork Unnamed Tributaries

Six unnamed tributaries enter the Fourmile Run Right Fork. In general, the tributaries flow through partially forested areas with few residences present close to the stream. UNT2S contains a new housing development constructed upon a reclaimed surface mine. UNT4N, similar to the right fork headwaters, contains black coloration and staining. A tributary not shown on the USGS topographical maps enters the main stem very close to the headwaters. That tributary originates

within an area that was surface mined. A small orange seep flows out of the area to meet the main stem of the right fork and iron oxide staining disappears at this confluence.

Fourmile Run Main Stem

The right and left fork of Fourmile Run converge in the community of Beatty. Just downstream of this confluence, AMD flows into the main stem. A majority of the AMD is treated within a system of passive treatment wetlands (see *Review of Historic Information* section for more information). Despite treatment, the substrate of the main stem is embedded with iron sediment. Multiple seeps that contribute small amounts of AMD are also located along the streambanks. Canopy cover and riparian vegetation are sufficient and consist primarily of oak, multiflora rose, and Japanese knotweed. Iron oxide staining from AMD continues to impact Fourmile Run until it meets Monastery Run close to the outflow from St. Vincent Lake.

Water Quality

Table 2.F.2: Sample Site M2
Monastery Run

Date Sampled	Alkalinity (mg/L)	Acidity (mg/L)	pH	Iron (mg/L)	Mn (mg/L)	Al (mg/L)	Sulfates (mg/L)
1/04	124	-190	6.77	18.11	2.401	0.376	369
5/04	94	-77	7.10	2.49	0.659	1.035	<0.92
7/04	127	-116	7.15	1.82	2.141	0.225	377
10/04	103	-81	6.79	<0.06	2.294	<0.04	478

The mouth of Monastery Run is sampled monthly by Saint Vincent College. Water quality data for Monastery Run was obtained from the Saint Vincent College database. The sample site selected for use is located close to the mouth of Monastery Run adjacent to Adelphoi Village. Water quality samples indicate impacts associated with AMD. Samples obtained in January of 2004 show significant amounts of iron. It is assumed that at this time, passive treatment systems upstream were unable to handle high flows from the discharges. Overall water quality information for the entire system shows that high flows in the winter and spring months overload the treatment system. This can create higher levels of iron downstream. Due to extensive existing data for the Monastery Run Subwatershed, no further samples were taken. Data for Monastery Run can be obtained by visiting http://facweb.stvincent.edu/EEC.

Sample Location: Sample taken downstream of Route 981 Bridge and close to the mouth of Monastery Run. Site can be accessed by travelling north on Route 981 from Route 30. Turn right into the Adelphoi Village School complex and walk to the stream.

Conclusions

Monastery Run exhibits impacts mostly from AMD. These impacts are most apparent within the lower section of the subwatershed. Passive treatment systems currently remove 90% of the suspended metals from mine water discharges entering the stream. Despite this effective treatment, AMD continues to seep into the stream. Also, in times of high flow, the passive treatment system is unable to fully treat discharging water. Currently, Saint Vincent College and multiple partners are modifying, repairing, and updating the system to compensate for those high flows. Iron oxide precipitate has gathered on the substrate of Monastery Run and Fourmile Run for decades. That precipitate allows Fourmile Run and Monastery Run to remain orange in color despite the treated water that flows.

The remainder of the Monastery Run subwatershed rated surprisingly low. A majority of the subwatershed, including the Monastery Run main stem and two forks of Fourmile Run, contains degraded

streamside riparian areas. In addition, stream substrates are embedded with significant amounts of silt and mud. This appears to be the result of surrounding agricultural landscapes and degraded streamside riparian vegetation.

It is important to note that the Fourmile Run Right Fork contains several new housing developments. It will be important to monitor further development within the subwatershed. In addition, community members should be made aware of steps they can take to ensure the increased development has a minimal impact upon nearby streams. The Fourmile Run Left Fork, especially in the headwaters, contains minimal development. It will be critical to ensure that current open space remains.

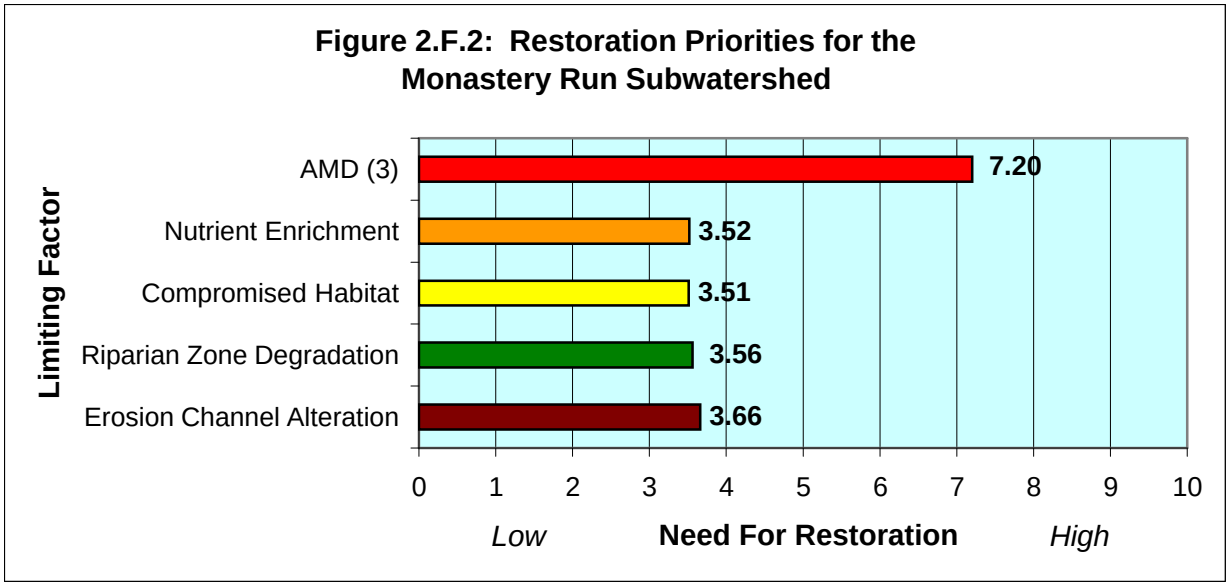
Recommendations

The following overall recommendations are made for the Monastery Run Subwatershed:

- Address AMD challenges on Fourmile Run, a large tributary to Monastery Run. Work with Saint Vincent College to improve, update, modify, and monitor the passive treatment system currently treating AMD.
- Work with landowners within housing developments to install riparian vegetation along streambanks, control stormwater, and to use BMPs for lawns. This could include planting trees, plants, and grasses that slow water running off and through the yards.
- Provide information to landowners regarding the maintenance of streambank vegetation through public meetings and/or pamphlets.
- Investigate stormwater control systems around the Route 30 corridor and how they impact Monastery Run. Work with the local municipalities to adopt more effective stormwater control where possible.
- Address agricultural non-point source pollution in the headwater region. Work with landowners to install agricultural BMPs with funding through CREP, the state, and other federal sources.

Overall Restoration Priorities

Figure 2.F.2 exhibits overall restoration priorities for the entire subwatershed. As indicated, the limiting factor that received the highest restoration priority rating is AMD. Three stream segments contain visible signs of AMD. That AMD originates primarily from the Saint Vincent College passive treatment system effluent and multiple seeps. It is concentrated in the main stem portion of Fourmile Run and downstream of its confluence with the Monastery Run main stem. All other limiting factors also received relatively high ratings for restoration priority. These ratings reflect impacts in headwater sections of the subwatershed.



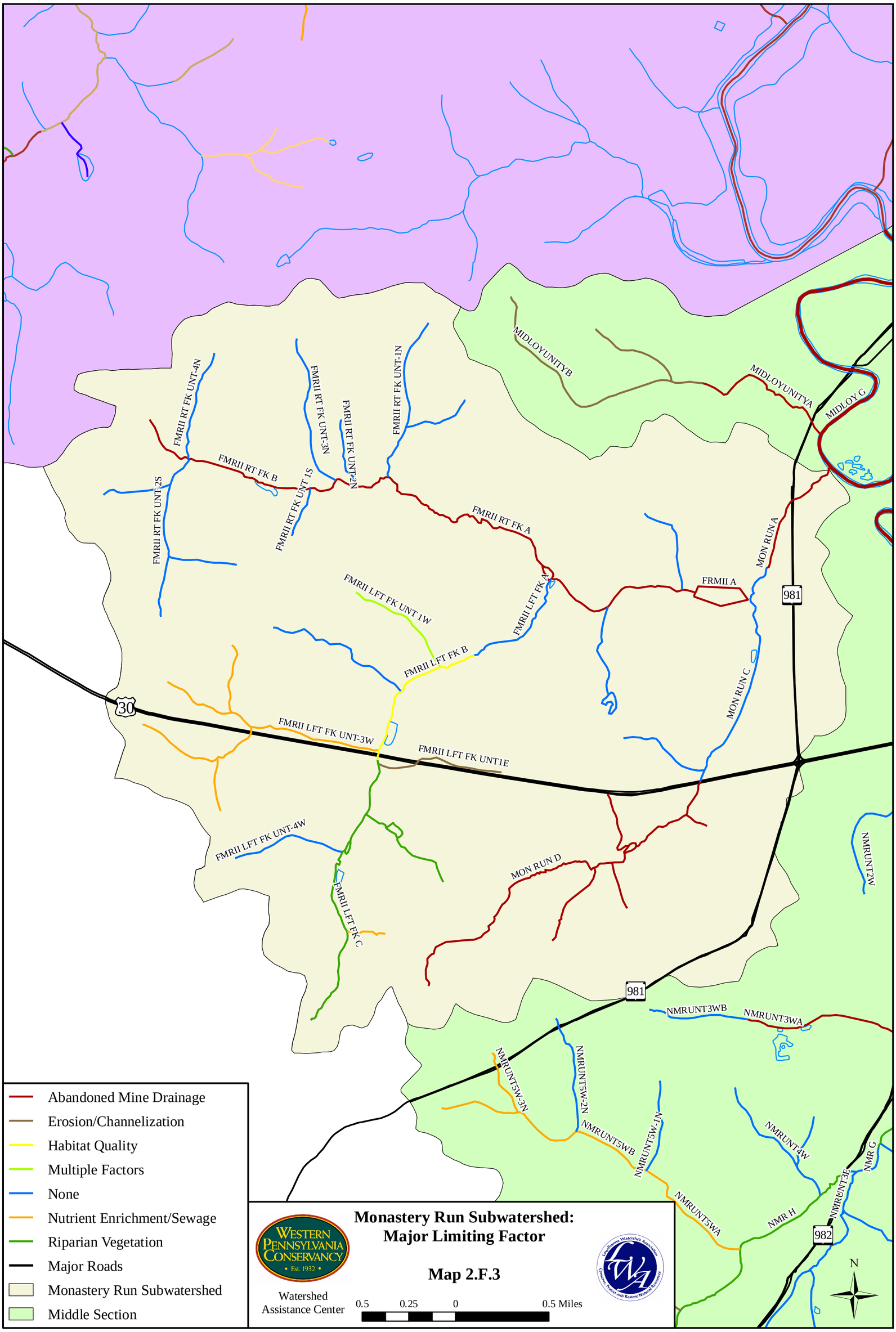
Restoration Suggestions For Individual Stream Segments

Thirteen stream segments received scores identifying limiting factors. The limiting factors identified were erosion and channel alteration, compromised fish and macroinvertebrate habitat, riparian vegetation degradation, nutrient enrichment, and AMD. Please refer to Table 2.F.2 and Map 2.F.3 for segment location and impact description.

Table 2.F.2: Impacted Stream Segments and Restoration Suggestions for the Monastery Run Subwatershed

LIMITING FACTOR: Riparian Vegetation Degradation

Stream Segment Name	Description of Impact	Remediation Strategy	Possible Funding Sources	Priority Rating
FMRII LFTFK UNT1E *Small tributary that flows beside Route 30 westbound.*	The riparian zone is practically devoid of vegetation. Some grass growth occurs, and no trees. The road is close to the stream.	1. Educate landowners. 2. Work with township and state to create a vegetative buffer for the stream and its channel. Possible Partners: WCD, Unity Township, PennDOT	Local, State, Federal	Low
FMRII LFTFK UNT1W *Small tributary that flows through a residential area.*	Landowners have removed a majority of riparian zone vegetation. The lawns are mowed directly to the streambank.	1. Educate landowners. Possible Partners: WCD, Unity Township	Local, State	Low


MIDLOYUNITYB
MIDLOYUNITYA
MIDLOY G
FMRII RT FK UNT-4N
FMRII RT FK UNT-3N
FMRII RT FK UNT-2N
FMRII RT FK UNT-1N
FMRII RT FK B
FMRII RT FK UNT-2S
FMRII RT FK UNT 1S
FMRII RT FK A
MON RUN A
FRMII A
981
FMRII LFT FK UNT 1W
FMRII LFT FK A
FMRII LFT FK B
MON RUN C
30
FMRII LFT FK UNT-3W
FMRII LFT FK UNT1E
FMRII LFT FK UNT-4W
MON RUN D
NMRUNT2W
FMRII LFT FK C
981
NMRUNT3WB
NMRUNT3WA
NMRUNT5W-3N
NMRUNT5W-2N
NMRUNT5W-1N
NMRUNT5WB
NMRUNT4W
NMR G
NMRUNT3E
NMR H
NMRUNT5WA
982
N
Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Monastery Run Subwatershed
Middle Section
Monastery Run Subwatershed:
Major Limiting Factor
Map 2.F.3
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
0.5 0.25 0 0.5 Miles

FMRII LFTFK UNT2E *Small tributary that flows through farm fields.*	Grass is the only vegetation surrounding the stream channel. It is not clear whether or not there is active farming occurring.	1. Educate landowners. 2. Determine status of property and work accordingly with the landowner with appropriate programs. Possible Partners: WPC, FSA, PSCE, WCD	Local, State, Federal	Low
FMRII LFTFKB *Main stem section of Fourmile Run Left Fork that flows next to Beatty Road. In this section, the stream is surrounded mostly by residences.*	Landowners have mowed lawns to the streambanks. Some trees are located along the streambank.	1. Educate landowners. Possible Partners: WCD, Unity Township	Local, State	Low
FMRII LFTFKC *The headwater section of Fourmile Run Left Fork. It flows through pastureland.*	The streambank does have some low-lying vegetation, including tall grass and shrubs. However, this vegetation is limited and there are very few trees providing adequate shade for the stream.	1. Educate landowner. 2. Work with landowner to install agricultural BMPs to address the lack of vegetation. Possible Partners: WPC, FSA, PSCE, WCD	Local, State, Federal, Private	Medium *(Headwater location)*
LIMITING FACTOR: Compromised Fish and Macroinvertebrate Habitat				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
FMRII LFTFK UNT1E *Small tributary that flows beside Route 30 westbound.*	Stream substrate is dominated by mud. Very little habitat or food source available for stream life. Lack of streamside vegetation and canopy cover removes potential food sources as well.	1. Educate landowners. 2. Determine source of silt and sand. 3. Remediate riparian vegetation, which will act as a filter/buffer to sediment entering the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Low

FMRII LFTFK UNT1W *Small tributary that flows through a residential area.*	Stream substrate is dominated by mud. Very little habitat or food source available for stream life. Lack of streamside vegetation and canopy cover removes potential food sources as well.	1. Educate landowners 2. Determine source of silt and sand. 3. Remediate riparian vegetation, which will act as a filter/buffer to sediment entering the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Low
FMRII LFTFK UNT2E *Small tributary that flows through farm fields.*	Stream substrate is dominated by silt and contains little or no habitat and food source for stream life. Absence of significant streamside vegetation removed potential food sources as well.	1. Educate landowners. 2. Determine source of silt and sand. 3. Remediate riparian vegetation, which will act as a filter/buffer to sediment entering the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Low
FMRII LFTFKB *Main stem section of Fourmile Run Left Fork that flows next to Beatty Road. In this section, the stream is surrounded mostly by residences.*	The stream substrate contains some silt and sediment. That material has partially embedded cobble and gravel that serve as habitat. In addition, the lack of streamside vegetation throughout this section exacerbates the sediment problem.	1. Educate landowners. 2. Determine source of silt and sand. 3. Remediate riparian vegetation, which will act as a filter/buffer to sediment entering the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Medium
FMRII LFTFKC *The headwater section of Fourmile Run Left Fork. It flows through pastureland.*	Stream substrate is comprised of embedded cobble and gravel. Available habitat is covered and due to the lack of riparian vegetation throughout the section; food sources are also limited for stream life.	1. Educate landowners. 2. Determine source of silt and sand. 3. Remediate riparian vegetation, which will act as a filter/buffer to sediment entering the stream. Possible Partners: WCD, DEP, Unity Township	Local, State	Medium *(Headwater Location)*

LIMITING FACTOR: Erosion and Channel Alteration				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
MONRUNA *Main stem stream segment that extends through the residential area of Dorothy and to the mouth of the stream.*	The streambanks are very high, eroding, and in some cases stabilized with large rip rap. This is especially the case where the stream passes underneath Route 981.	1. Educate landowners. 2. Encourage landowners to plant trees and shrubs along the streambanks to support and strengthen rather than use rip rap or other methods. 3. Determine reason for use of rip rap support around Route 981. Possible Partners: Unity Township, City of Latrobe, WCD, DEP	Local, State	Medium
FMRII LFTFKB *Main stem section of Fourmile Run Left Fork that flows next to Beatty Road. In this section, the stream is surrounded mostly by residences.*	The stream has been channelized through multiple culverts and the banks are eroding slightly. The absence of riparian vegetation throughout the stream segment contributes to erosion.	1. Educate landowners. 2. Encourage landowners to plant trees and shrubs to support and strengthen the streambanks. Possible Partners: Unity Township, WCD, DEP	Local, State	Medium
FMRII LFTFK UNT1E *Small tributary that flows beside Route 30 westbound.*	The stream has been channelized as it flows beside Route 30. The banks of the stream channel have been eroded. In some cases the erosion is caused by runoff from the road. The substrate of the stream is more than 60% embedded with silt.	1. Educate landowners. 2. Work with the township and with PennDOT to remediate erosion and to plant riparian vegetation to act as a buffer and stabilizer. Possible Partners: Unity Township, PennDOT, WCD, DEP	Local, State, Federal	Low – Medium
FMRII LFTFK UNT1W *Small tributary that flows through a residential area*	The stream has been channelized and its banks are eroding. The substrate of the stream is more than 50% embedded with silt and mud.	1. Educate landowners. 2. Stabilize streambanks by planting trees and shrubs along the stream. Possible Partners: WCD, DEP	Local, State	Low

FMRII LFTFK UNT2E *Small tributary that flows through farm fields.*	The stream channel appears to have been straightened and channelized through the field. Some erosion is present and the substrate is embedded with silt.	1. Educate landowner. 2. Investigate channelization of the stream re-install meander. 3. Stabilize streambanks by planting trees and shrubs along the stream. Possible Partners: WCD, DEP	Local, State	Low
LIMITING FACTOR: Nutrient Enrichment				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
FMRII LFTFK UNT1W *Small tributary that flows through a residential area.*	The substrate is covered with algae. Source of algae is unknown, but it is suspected that it is related to waste flowing from failing septic systems	1. Educate homeowners. 2. Encourage homeowners to practice methods that result in better functioning septic systems. Possible Partners: PSCE, WCD, Unity Township	Local, State	Low
FMRII LFTFK UNT1E *Small tributary that flows beside Route 30 westbound.*	The substrate is covered with algae. The source is unknown, but it is suspected that it is related to sewage waste and/or road runoff.	1. Educate homeowners. 2. Encourage homeowners to practice methods that result in better functioning septic systems. Possible Partners: PSCE, WCD, Unity Township	Local, State	Low
FMRII LFTFK UNT3W *Tributary that flows through a dairy farm and Statler's Fun Park adjacent to Route 30 westbound.*	Cows have direct access to the stream. Algal growth is present downstream of the farm.	1. Educate landowner. 2. Work with landowner to install agricultural BMPs. Possible Partners: WCD, USDA, PSCE, WPC, Unity Township	Local, State, Federal	Medium

FMRII LFTFK UNT3E *Small tributary that flows along Onega Road through a pasture.*	Cows have direct access to the stream. Some algal growth is present.	1. Educate landowner. 2. Work with landowner to install agricultural BMPs. Possible Partners: WCD, USDA, PSCE, WPC, Unity Township	Local, State, Federal	Medium
FMR RTFK A *Main stem section of Fourmile Run Right Fork that flows through a residential area along Beatty Flats Road.*	Horses have direct access to the stream. There are not a lot of horses, but the impact is visible. Downstream of the farm, some algal growth is present.	1. Educate landowners. 2. Work with landowner to install agricultural BMPs. Possible Partners: WCD, USDA, PSCE, WPC, Unity Township	Local, State, Federal	Low – Medium
FMR RTFK B *Main stem section of Fourmile Run Right Fork that extends from the headwaters to the Norfolk-Southern Railroad tunnel.*	The water and substrate are tinted black. Black algal growth is visible on the stream substrate.	1. Educate landowners. 2. Work with landowner to install agricultural BMPs. Possible Partners: WCD, USDA, PSCE, WPC, Unity Township	Local, State, Federal	Medium
MONRUND *Main stem section of Monastery Run that includes the headwater portion. It flows through fields, row crops, and pasture.*	Some algal growth is noticeable in the stream substrate. It appears that livestock have had access to the stream, but at the time of the assessment, there were none present.	1. Educate landowners. 2. Work with landowner to install agricultural BMPs. Possible Partners: WCD, USDA, PSCE, WPC, Unity Township	Local, State, Federal	Low – Medium
LIMITING FACTOR: Abandoned Mine Drainage				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
MONRUNA *Main stem stream segment that extends through the residential area of Dorothy and to the mouth of the stream.*	Water is orange in color and the substrate is more than 50% embedded with iron oxide sediment. One small seep was located within the section.	1. Upstream discharge is treated by a passive system maintained by SVC. Work with SVC and other partners to improve the system and ensure continued operation. Possible Partners: SVC, WCD, NRCS, DEP, OSM	State, Federal, Private	Medium – High

MONRUNB *Main stem section of Monastery Run that extends from Dorothy upstream to the confluence of Fourmile Run and Monastery Run.*	Water is orange in color and the substrate is embedded with iron oxide sediment. It is at the confluence of Monastery Run and Fourmile Run that the orange coloration starts.	1. Upstream discharge is treated by a passive system maintained by SVC. Work with SVC and other partners to improve the system and ensure continued operation. Possible Partners: SVC, WCD, NRCS, DEP, OSM	State, Federal, Private	Medium – High
FMRII A *Main stem section of Fourmile Run before it splits into two branches. This section flows through a low-lying area with fields on one side and an AMD passive treatment system on the other.*	The water is colored orange throughout the entire section. Multiple seeps enter the stream from the streambank and most likely through the stream substrate.	1. Work with SVC and other partners to maintain passive treatment system remediating 90-95% of the AMD pollution. 2. Design method to treat the multiple seeps located throughout the section. Possible Partners: SVC, WCD, NRCS, DEP, OSM	State, Federal, Private	Medium – High
FMR RTFK A *Main stem section of Fourmile Run Right Fork that flows through a residential area along Beatty Flats Road.*	Water and substrate are tinted black. The cause of the black coloration is unknown and originates upstream in the headwater section.	1. Determine source of black coloration. 2. Monitor the source. 3. Determine method to remediate the source. Possible Partners: SVC, WCD, NRCS, DEP, OSM	State, Federal	Medium
FMR RTFK B *Main stem section of Fourmile Run Right Fork that extends from the headwaters to the Norfolk-Southern Railroad tunnel.*	Dark black water flows in at the headwaters. It originates from underneath the Norfolk-Southern Railroad. The source remains unknown. In addition, an orange seep flows in at the headwaters that originates at an old strip mine known as the Buffenmyer Mine.	1. Determine source of the black water discharge. 2. Monitor the source. 3. Determine method to remediate the source. 4. Explore options for the remediation or re-mining of the Buffenmyer Strip Mine. Possible Partners: SVC, WCD, NRCS, DEP, OSM	State, Federal	Medium

FMRII RTFK UNT4N *Small tributary that flows from the Norfolk Southern Railroad line into Fourmile Run Right Fork.*	The water flowing in the tributary is very black. The substrate of the stream is also black.	1. Determine source of the black water discharge. 2. Monitor the source. 3. Determine method to remediate the source. 4. Explore options for the remediation or re-mining of the Buffenmyer Strip Mine. Possible Partners: SVC, WCD, NRCS, DEP, OSM	State, Federal	Medium

SECTION 2.G
SAXMAN RUN

Section 2.G

Saxman Run Subwatershed

General Description

The 6.2 square-mile Saxman Run Subwatershed is located in the southeast portion of Derry Township. Saxman Run and its tributaries flow westward following the Norfolk-Southern Railroad Line. Saxman Run flows through the communities of West Derry, Bradenville, Snydertown, and Loyalhanna.

The headwaters of Saxman Run trickle out of a forested hillside south of Route 217 in West Derry. The stream flows north to meet Route 217 and turns to flow west toward Latrobe. This is the only portion of the entire main stem that is not impacted by AMD. Due to three significant discharges found along the main stem, 75% of the subwatershed is impacted by AMD.

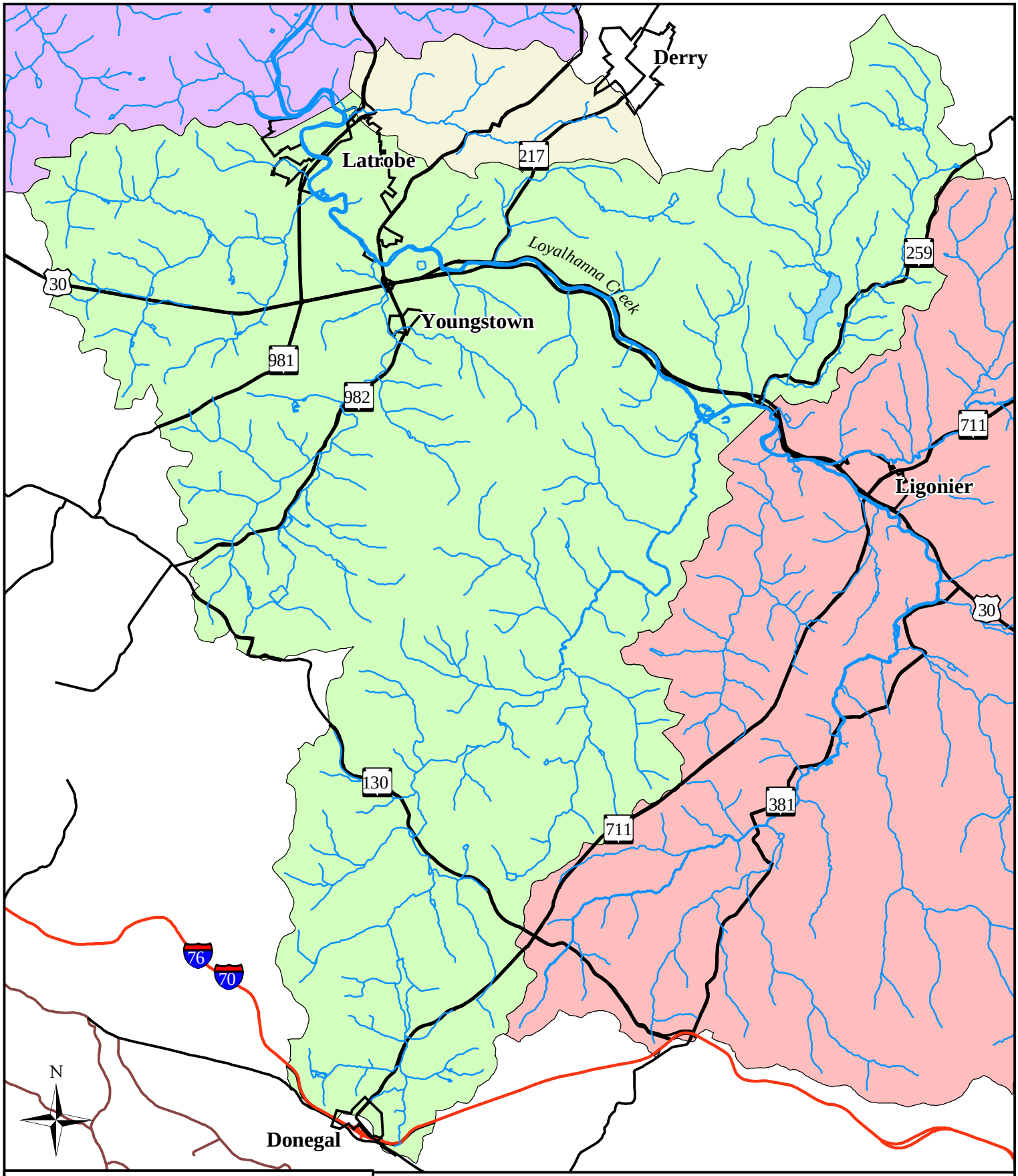
Saxman Run looking upstream from the Lattanzio Road Bridge at the Latrobe sewage treatment plant

After passing underneath Route 217, Saxman Run flows into a residential area where homes and small businesses line the stream. Saxman Run continues to travel through a residential landscape as it flows west adjacent to Route 217. At the intersection of Route 217 and Latrobe-Derry Road, Saxman Run continues to follow Latrobe-Derry Road into the community of Bradenville. Close to that intersection, the stream flows through a wetland surrounded by scrubby forest containing shrubs and small trees. At the Bradenville Elementary School, Saxman Run emerges from the scrub forest and moves into a residential area once again.

Not until passing through the small community of Snydertown does the landscape surrounding Saxman Run change. Residences are replaced by large factories and warehouse buildings, especially on the northern side of the stream. The riparian area surrounding Saxman Run is significant; however, it is dominated by undesirable vegetation such as multiflora rose, Japanese knotweed, and green briar.

Saxman Run breaks away from the Latrobe-Derry Road as it intersects with Route 981. Here, Saxman Run briefly turns north to pass underneath the Norfolk-Southern Railroad. It then flows underneath Lattanzio Road and past the Latrobe sewage treatment plant. Finally, Saxman Run meets the Loyalhanna Creek main stem immediately downstream of the sewage treatment plant.

The Saxman Run Subwatershed, a WWF, flows through an area dominated by residences, small businesses, and factories. Only the extreme headwater area of the stream is devoid of roads, homes, and other population-related impacts. The subwatershed is not meeting its current designation and a TMDL is in progress. For the geographic location of this subwatershed, refer to Map 2.G.1.



Saxman Run Subwatershed: Overall Location

Map 2.G.1

Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center

1 0.5 0 1 Miles

Loyalhanna Watershed Association
Conserve, Protect and Restore Natural Resources

Review of Historic Information

Overall Summary

Saxman Run is named for the Saxman family who were part of the early economic development of the Latrobe area. The Saxman's owned and operated several deep mines within the subwatershed and surrounding area. In addition, they were involved with other manufacturing operations in Latrobe and within the Saxman Run Subwatershed.

According to the 1972 Scarlift Report, there are 17 known deep mines of various sizes located within the entire subwatershed. Of the 17, three of those were major mining operations. The mines extended from the headwater area to the mouth of the stream. The Pittsburgh, Upper Freeport, and Freeport coal seams were all mined. Physical evidence of the strong coal mining presence includes mostly coal patch town homes and small refuse piles. The most visible evidence of coal mining within the subwatershed can be found in the water flowing within Saxman Run. More than 75% of the Saxman Run Subwatershed is impacted by AMD. Approximately 90% of the main stem is impacted by AMD.

Scarlift Report

Three discharges were identified within the Saxman Run Subwatershed during fieldwork for the Scarlift Report. Today, there are four known discharges within the subwatershed. Please refer to the following chart for a complete list of those discharges found during fieldwork for the Scarlift Report.

Saxman Run Subwatershed Discharges Catalogued During Scarlift		
Scarlift Discharge Number	**Current Discharge Name**	**Description of Discharge and Location**
5177	Upper Saxman Discharge	Until the spring of 2004, this 2,300 gpm discharge was located upstream of the Latrobe-Derry Road and Route 981 intersection. Emanating from an old mine entry, the discharge was conveyed underneath Latrobe-Derry Road through a large culvert. In May of 2004, that discharge was relocated by PennDOT and now no water flows from the original site. Upper Saxman discharge now enters the stream at the intersection of Route 981 and Latrobe-Derry Road. The stream receives 5,000 - 7,500 gpm through three 8-inch pipes located on the bank of Saxman Run. In the 1970s, the Upper Saxman Discharge was acidic with a pH between 2.8 and 4.6. The average pH today is between 5.4 and 5.7.
5074	West Derry Discharge	This discharge is located at the end of Valley Street in West Derry. The site can be accessed by traveling Route 217 North and turning right onto Valley Street just before entering the outskirts of downtown Derry. During data collection for the Scarlift Report, this discharge was flowing at approximately 70 gpm with a pH between 3.0 and 3.5. Today's flow calculations show a higher flow rate between 200 and 400 gpm. Unlike other discharges within the subwatershed, the chemistry of this discharge has

		remained relatively consistent over time. The average pH today is between 3.0 and 3.3.
5075	West Derry Discharge #2	This discharge is located close to the West Derry Discharge. It is a less consistent flow that meets the main flow from the West Derry Discharge. The flow emanates from a suspected mine entry area. During data collection for the Scarlift Report, field personnel said that the site was a caved-in pit. Chemistry for the discharge is very similar to the West Derry Discharge. The chemistry has not changed significantly over time and is consistent with water quality taken during Scarlift fieldwork.

Saint Vincent College

In 2002, Saint Vincent College received a Growing Greener grant to operate a pilot project to study innovative treatment of AMD. Using technology designed by Jon Dietz, Saint Vincent College and partners directed a portion of flow from the Lower Saxman Discharge into a special reactor. In that reactor, Activated Iron Sludge (AIS) accelerates the precipitation of iron oxide from AMD. At the time of this report, the pilot project was still in progress. The reactor is successfully accelerating iron oxide removal. For more information about this important study, please refer to Appendix 5.

PA Department of Environmental Protection (DEP)

Various reports from the DEP highlight water quality samples related to surface mining throughout the subwatershed. At the time of the report, there was one known active surface mine within the Saxman Run Subwatershed. That surface mine is located in the headwaters of the subwatershed on the west-facing slope of Chestnut Ridge. More complete information can be obtained at the DEP District Mining Office in Armbrust.

At the time of the report, one industrial site within the subwatershed was being investigated for groundwater and water impacts. Latrobe Plastics, the company and property in question, is located on Latrobe-Derry Road one-half mile from the intersection of Route 981 and Latrobe-Derry Road.

Loyalhanna Watershed Association

Since the summer of 2001, water quality samples have been collected from discharges located within the Saxman Run Subwatershed. Those discharges include Lower Saxman, Upper Saxman, and West Derry. Those discharge sites are described in Appendix 3.

U.S. Army Corps of Engineers

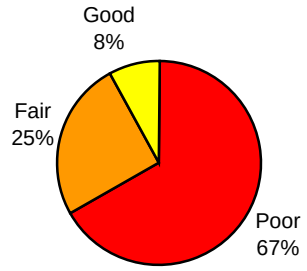
In 2002, the USACE completed a field survey of the entire Loyalhanna Creek Watershed. The mouths of several major streams were sampled. During that survey, the USACE assessed the entire Saxman Run Subwatershed. At the time of the assessment, pH readings had dropped significantly along the entire main stem. After extensive investigation, the drop in pH was correlated with the West Derry Discharge located in the headwater area. In 2002, the discharge chemistry became more acidic and carried twice the amount of metals as it had in the past. The cause of that chemistry change continues to be the subject of further investigation by the DEP, USACE, and the LWA.

Visual Assessment Summary

Visual Assessment Findings

The visual assessment of the Saxman Run Subwatershed was completed in April of 2004. A total of 12 stream segments were assessed. As depicted in Figure 2.G.1, 8% of the subwatershed received a good rating, 25% received a fair rating, and 67% received a poor rating. An average score of 5.92 was given to the entire subwatershed, which is a poor rating overall. The overall poor rating primarily reflects the impact of AMD, which is present within 90% of the Saxman Run main stem. In addition to the presence of AMD, there is also notable degradation of riparian areas, erosion, channelization, and habitat degradation. Individual stream segment ratings are depicted in Map 2.G.2.

Figure 2.G.1: Visual Assessment Ratings for the Saxman Run Subwatershed



Visual Assessment Description

Saxman Run Main Stem

The headwaters of Saxman Run are located in West Derry and flow from the western slope of Chestnut Ridge. A forested area, comprised of small hardwood trees surrounds the spring that feeds the main stem. That forested area gives way to a residential landscape as Saxman Run flows north away from its source. Through this headwater section, the stream substrate is more than 60% embedded with silt and mud. Tires, road signs, and other trash litter the substrate and the streambank. Very little canopy cover and streamside vegetation are present. Algal growth throughout the substrate indicates nutrient loading. Flowing pipes are located along the main stem in the headwater section. It is suspected that many of these pipes contain flow from failing septic systems.

Saxman Run main stem and the West Derry Discharge meet at Valley Road culvert

One thousand feet downstream from the headwater source, the main stem of Saxman Run changes significantly. A large AMD source enters the main stem at the intersection of Route 217 and Valley Street. Upon meeting Saxman Run, iron oxide precipitate is immediately visible. The source of the AMD is the West Derry Discharge. The discharge flows from a 10-12 inch pipe behind a small group of homes on Valley Street. It has an average pH of 3.0 and high levels of both iron and aluminum. Due to its acidic nature, water flowing from the pipe is clear. The substrate of the stream created by the

981
982
217
SAXUNT1NB
SAXUNT2NB
SAXUNT2NA
SAXA
SAXB
SAXC
SAXUNT2S
SAXUNT3N
SAXD
SAXUNT4N
SAXE
MIDLOY-C
MILR UNT-2W
MILR UNT-1W
MILR UNT-1E
MILRB
N
Poor
Fair
Good
Major Roads
Saxman Run Subwatershed
Middle Section
Saxman Run Subwatershed:
Overall Rating
Map 2.G.2
Western Pennsylvania Conservancy
Est. 1932
Watershed Assistance Center
Conemaugh Watersheds Association
Conserve, Protect and Restore Natural Resources
0.5 0.25 0 0.5 Miles

discharge is covered with bright green filamentous algae. The discharge is currently sampled quarterly by the LWA. Downstream of the confluence with the discharge, Saxman Run flows through an area thick with green briar, multiflora rose, and Japanese knotweed. Flowing the color of orange soda, the stream continues west toward Bradenville following Route 217. The substrate of the stream, comprised primarily of gravel and cobble, is embedded with iron oxide, some aluminum, and mud.

After crossing underneath Route 217, Saxman Run meanders through a field and retreats behind several businesses. It remains surrounded by scrubby vegetation and is littered with trash. Behind Derry Construction, located on Route 217, Saxman Run still flows orange. During fieldwork in April of 2004, a pH of 3.9 was measured at Derry Construction. Downstream of this area, Saxman Run spills into a wetland area located between an unused spur of the railroad and Latrobe-Derry Road. This wetland can be accessed through the Slovak Park that is located at the intersection of Route 217 and Latrobe-Derry Road. The wetland contains cattail, sedges, and other wetland plants, and is surrounded by a mixed hardwood forest. Saxman Run braids through the wetland with no definite channel. It is assumed that during periods of higher flow, the stream occupies a greater portion of the wetland.

Following its journey through the wetlands, Saxman Run flows into the town of Bradenville, where it passes by Bradenville Elementary School. A field pH of 5.0 was measured near the school and it is at this point that white aluminum precipitate starts to appear in the substrate. As Saxman Run proceeds westward, it flows through an area where various fill materials and trash has been dumped along the bank of the stream. Only grass occupies the streambanks through this section where fill material and homes line the streambank. The lack of canopy cover and vegetation continues as the Saxman Run main stem flows into the community of Snydertown. It passes underneath the intersection of Sportsman Road and Latrobe-Derry Road and moves into a residential area. The stream is once again littered with trash and has a creamy-orange color as it flows through a residential area. At the end of the residential area in Snydertown, the measured pH of Saxman Run was 4.4.

After passing a laundromat and carwash, Saxman Run passes underneath Latrobe-Derry Road again. It is at this point that the landscape surrounding the stream changes. Several operating and abandoned industrial complexes are located on the north bank of the stream and the road occupies the south bank. Vegetation surrounding the stream includes multiflora rose, green briar, Japanese knotweed, and small hardwood trees. The substrate of the stream is entirely embedded with iron oxide, aluminum precipitates, and mud. Trash, including tires, bottles, and Styrofoam, is scattered in and around the stream.

At the intersection of Latrobe-Derry Road and Route 981, a large abandoned mine discharge enters the main stem of the stream. The discharge is formed by three 8-inch pipes that discharge between 5,000 and 7,000 gpm of iron-laden water. The discharge, also known as Upper Saxman, was previously located upstream. During roadwork at the intersection, the discharge was relocated to the present site. Relocation occurred in order to move the discharge closer to an area where passive treatment could occur. The discharging water adds significant volume to Saxman Run. Where water from the main stem and the discharge mix, aluminum precipitate appears. The water flowing from the Upper Saxman discharge has an average pH of 6.3 – 6.5. Downstream of the discharge, Saxman Run passes underneath the railroad line and into a forested area. It flows through the forested area for a short distance and encounters the Lower Saxman Discharge just before passing underneath Lattanzio Road. Lower Saxman adds an average of 2,000 gpm of mine water to the stream. The Lower Saxman Discharge has been captured and a portion of it flows into a pilot treatment system at the Latrobe sewage treatment plant. Passing underneath Lattanzio Road, the main

The mouth of Saxman Run as it enters the main stem of the Loyalhanna Creek

stem of Saxman Run remains orange in color. The stream substrate is dominated by iron oxide sediment.

For the last 1,000 feet, Saxman Run flows adjacent to the Latrobe sewage treatment plant. It is surrounded by hardwood forest and its banks are occupied by thick stands of Japanese knotweed. Saxman Run turns the main stem of the Loyalhanna Creek orange at their confluence. This confluence occurs immediately downstream of the Latrobe sewage treatment plant outflow.

Saxman Run Unnamed Tributaries

Four identified unnamed tributaries enter the main stem of Saxman Run. Several other intermittent and flowing tributaries were discovered during fieldwork that were not delineated on the USGS topographic maps. Of those tributaries, two (UNT3N, UNT2S) are significant and were visually assessed. One of the unidentified tributaries is formed by the West Derry Discharge and was not assessed as a separate tributary.

None of the tributaries have impacts from AMD. However, they do have impacts from nutrient loading. Algal growth throughout the substrate of many tributaries is caused by discharging sewage in residential areas as well as agricultural impacts. All of the tributaries flow through areas choked with multiflora rose and other shrubs, such as green briar. In many cases, they are also channeled underneath roads and, in the case of UNT1S, for many feet before reaching the Saxman Run main stem.

UNT3N and UNT2S are assessed tributaries that did not appear on USGS topographic maps. Due to their size and length, both were added to the maps and assessed. UNT3N flows through the community of Bradenville. Its headwaters are located in a trailer park found along Route 982. From the headwaters, the stream flows south underneath Route 982 and an abandoned railroad spur. It then moves through a shallow hollow found behind a major concentration of homes. The hollow is overgrown with a variety of leafy vegetation, vines, and small trees. After passing underneath the main line of the Norfolk-Southern Railroad, it enters Saxman Run upstream of the Bradenville Elementary School. Flow from failing septic systems can be found throughout the entire length of this tributary.

UNT2S is located closer to West Derry. Originating south of Route 217, the stream flows north to meet the Saxman Run main stem. It passes underneath Route 217 near Derry Construction and a healthcare facility. After flowing through a field, the tributary meets the main stem downstream of the healthcare center.

Water Quality

Water quality samples were taken close to the mouth of Saxman Run throughout the assessment. Those samples reflected the large abandoned mine discharges located upstream. As reported, the amount of total iron present in the stream is significant. Each of the discharges contributing to the AMD impact upon Saxman Run are sampled quarterly by the LWA. Those water quality results are reported in Appendix 3.

Table 2.G.1: Sample Site LWA-11
Saxman Run

Date Sampled	pH	Alk. (mg/L)	Acid. (mg/L)	TSS (mg/L)	TDS (mg/L)	Sulfates (mg/L)	Ferrous Iron (mg/L)	Total Iron (mg/L)	Mn (mg/L)	Al (mg/L)
5/25/04	6.02	40.0	- - -	16.0	654.0	- - -	- - -	20.2	- - -	- - -
8/25/04	5.73	315.0	- - -	17.0	678.0	- - -	6.2	31.0	- - -	- - -
10/25/04	6.19	127.0	-18.0	6.0	- - -	486.0	5.0	30.3	4.7	<0.04
1/25/05*	6.00	41.0	48.4	40.0	- - -	397.3	25.2	36.4	3.5	3.3

* Sample analyzed by the DEP Bureau of Laboratories

Sample Location: Sample taken from the Lattanzio Road Bridge over Saxman Run. To access the sample site, take Route 981 North toward Keystone State Park. Take an immediate left on to Lattanzio Road after travelling through the railroad underpass. Continue straight at the stop sign and proceed 500 feet to the bridge.

Conclusions

Saxman Run exhibits significant impacts primarily from AMD. More than 90% of the Saxman Run main stem is impacted by discharges entering the stream throughout its entire length. Currently, none of the discharges are being treated. However, there are long-range plans for treatment of the two largest discharges located close to the mouth of the stream. One of the discharges, Lower Saxman, is involved in a pilot study being carried out by Saint Vincent College. It is anticipated that the technology being tested will eventually aid in the overall treatment of discharges along Saxman Run.

The streambanks and stream substrate throughout the subwatershed are covered with rubbish. Styrofoam pieces, appliances, tires, siding, wood, bottles, and aluminum cans are just some of the items that add to the overall litter problem within the subwatershed.

The Saxman Run Subwatershed is one of the most degraded streams within the entire Loyalhanna Creek Watershed. The three major abandoned mine discharges within Saxman Run contribute more than 2,000 pounds of iron per day to the stream and ultimately to the Loyalhanna Creek.

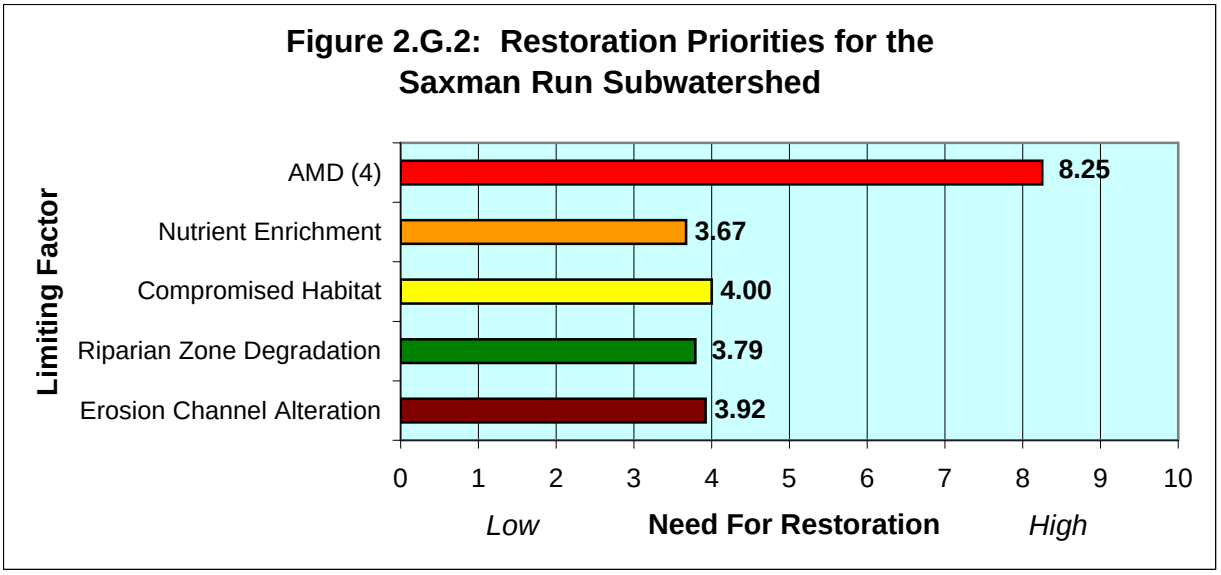
Recommendations

The following recommendations are made for the Saxman Run Subwatershed:

- Continue to work with federal, state, county, and local organizations to remediate the three abandoned mine discharges within the Saxman Run Subwatershed.
- Educate the Saxman Run Subwatershed community. Increase local awareness of the AMD impact and the potential for future solutions.
- Organize trash cleanup dates within the Saxman Run Subwatershed community.
- Monitor Saxman Run's overall impact upon the Loyalhanna Creek main stem.

Overall Restoration Priorities

Figure 2.G.2 exhibits overall restoration priorities for the entire Saxman Run Subwatershed. As indicated, the limiting factor that received the highest restoration priority rating was AMD. Three sources of AMD exist within the subwatershed. As much as 90% of the Saxman Run main stem is impacted by AMD. In addition to high priority ratings in the AMD category, other limiting factors also rated high, most specifically, compromised habitat. This is most likely a result of iron and aluminum sediment precipitating to the stream bottom. Nutrient enrichment also rated high. This reflects tributaries where suspected sewage impacts were located during the visual assessment. In addition, algae are present within the substrates of all Saxman Run tributaries.



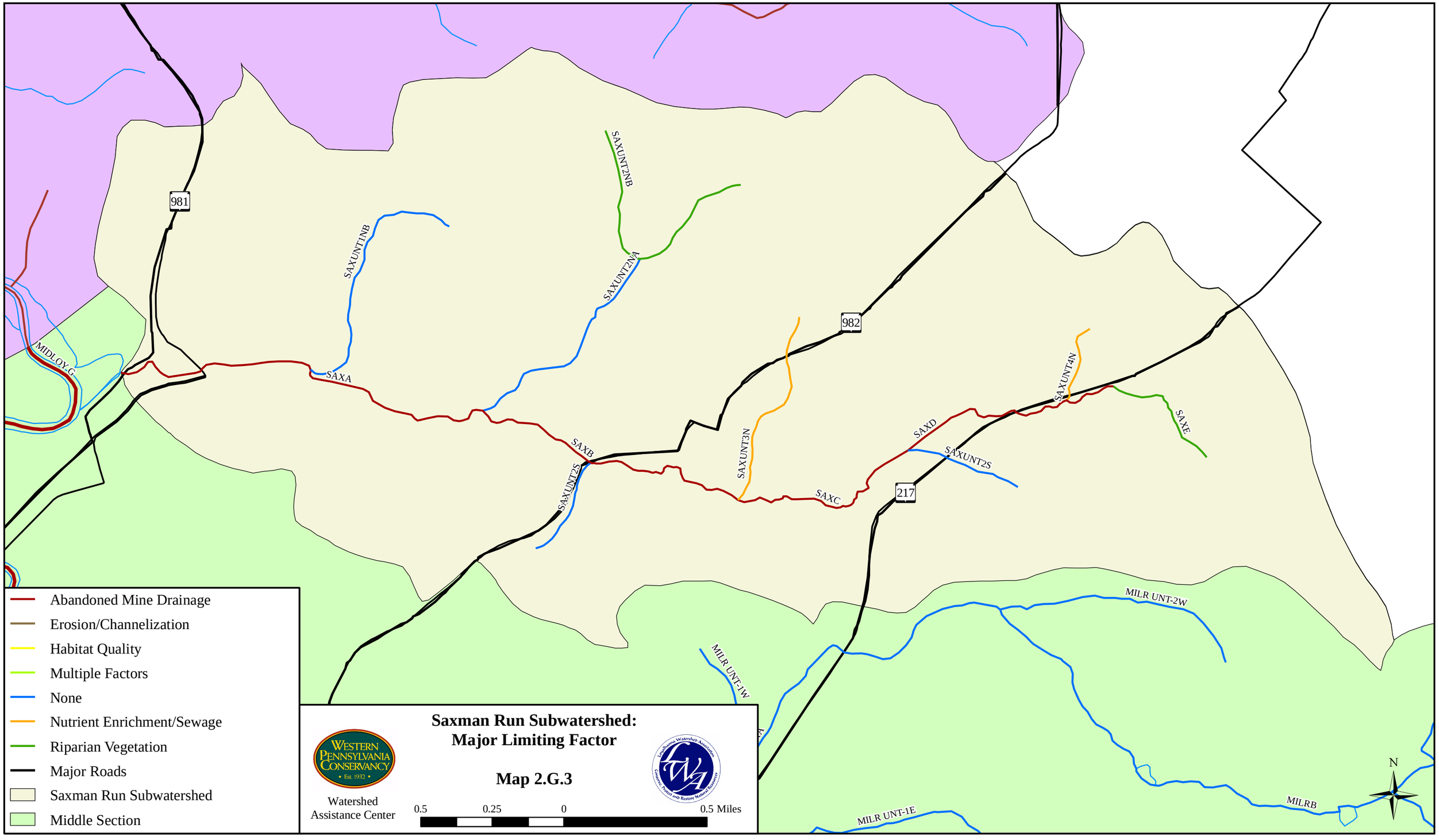
Restoration Suggestions for Individual Stream Segments

Eight stream sections received scores indicating notable impacts. The limiting factors identified were erosion and channel alteration, compromised fish and macroinvertebrate habitat, riparian vegetation degradation, nutrient loading, and AMD. Please refer to Table 2.G.2 and Map 2.G.3 for impact description and segment location.

Table 2.G.2: Impacted Stream Segments and Restoration Suggestions for the Saxman Run Subwatershed

LIMITING FACTOR: Riparian Vegetation Degradation

Stream Segment Name	Description of Impact	Remediation Strategy	Possible Funding Sources	Priority Rating and Cost
SAXB *Main stem segment that flows through a residential area in Snydertown.*	Homes, mowed lawns, and road surround the streambank. Very little vegetation is present and there are very few trees that provide canopy cover.	1. Educate landowners. 2. Work with landowners and the City of Latrobe to remediate the streambank. Possible Partners: DEP, City of Latrobe	Local, State	Low – Medium
SAXE *The headwaters of the main stem that flows through a residential area in West Derry.*	Homes, mowed lawns, road, and trash surround the streambank. Tires, road signs, aluminum siding, etc. are strewn beside the stream. No trees are present to provide shade to the stream.	1. Educate landowners. 2. Clean up area surrounding the stream. 3. Work with township and landowners to remediate streambank. Possible Partners: WCD, DEP, Derry Township	Local, State	Medium *(due to headwater location)*


981
982
217
SAXUNT1NB
SAXUNT2NB
SAXUNT2NA
SAXA
SAXB
SAXC
SAXD
SAXUNT3N
SAXUNT4N
SAXUNT2S
SAXE
MIDLOY.C
MILR UNT-2W
MILR UNT-1W
MILR UNT-1E
MILRB
N
Abandoned Mine Drainage
Erosion/Channelization
Habitat Quality
Multiple Factors
None
Nutrient Enrichment/Sewage
Riparian Vegetation
Major Roads
Saxman Run Subwatershed
Middle Section
Saxman Run Subwatershed:
Major Limiting Factor
Map 2.G.3
Watershed
Assistance Center
0.5
0.25
0
0.5 Miles

SAXUNT2NB *Headwater section of a tributary to Saxman Run that flows through fields and pasture.*	The only vegetation surrounding the upper portion of this tributary is grass. Very few trees are present to provide shade to the stream.	1. Educate landowner. 2. Work with landowner to plant more significant vegetation along the streambank. Possible Partners: WCD, DEP, Derry Township	Local, State	Low
SAXUNT4N *Small tributary that flows into Saxman Run near the headwaters in West Derry. It flows through a residential area.*	Homes and mowed lawns surround the stream. Very few trees are located along the streambank. Trash is strewn in and around the stream.	1. Educate landowners. 2. Clean up trash. 3. Work with landowners to remediate streambank and plant trees or shrubs. Possible Partners: WCD, DEP, Derry Township	Local, State	Low
LIMITING FACTOR: Compromised Fish and Macroinvertebrate Habitat				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
SAXD *Main stem section that flows through an area surrounded by residences, businesses, and road.*	The substrate of the stream is 90% embedded with iron oxide sediment. Habitat is covered and food sources are absent. Multiple dams and culverts impede movement of fish.	1. Remediate discharge creating iron oxide sediment. 2. Educate landowners about the AMD challenge. Possible Partners: DEP, WCD, Derry Township, OSM, USACE	Local, State, Federal	High
SAXE *The headwaters of the main stem that flows through a residential area in West Derry.*	The substrate of the stream is 90% embedded with iron oxide sediment. Habitat is covered and food sources are absent. Multiple dams and culverts impede movement of fish.	1. Remediate discharge creating iron oxide sediment. 2. Educate landowners about the AMD challenge. Possible Partners: DEP, WCD, Derry Township, OSM, USACE	Local, State, Federal	High

SAXUNT2NB *Headwater section of a tributary to Saxman Run that flows through fields and pasture.*	Lack of streamside vegetation has eliminated food source as well as potential habitat.	1. Educate landowner. 2. Work with landowners to remediate streambank and plant trees or shrubs. Possible Partners: WCD, Derry Township, DEP	Local, State	Low
SAXUNT4N *Small tributary that flows into Saxman Run near the headwaters in West Derry. It flows through a residential area.*	Homes and mowed lawns surround the stream. Very few trees are located along the streambank. Trash is strewn in and around the stream. Lack of vegetation has eliminated food source as well as habitat.	1. Educate landowner. 2. Work with landowners to remediate streambank and plant trees or shrubs. Possible Partners: WCD, Derry Township, DEP	Local, State	Low
LIMITING FACTOR: Erosion and Channel Alteration				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
SAXA *Main stem section that extends from the mouth of the stream to Snydertown. It is surrounded by a mix of forest, residences, industry, and Latrobe-Derry Road.*	Stream passes through multiple culverts and is channelized in many locations due to bridges and roads.	1. Investigate channelization and determine the need that required it. 2. Work with township and PennDOT to identify alternative methods of stabilization of the streambank. Possible Partners: WCD, DEP, Derry Township, City of Latrobe, PennDOT	Local, State	Low – Medium
SAXB *Main stem segment that flows through a residential area in Snydertown.*	Stream passes through a residential area where the streambank has been stabilized with rip rap and other materials. In addition, it is clear that the stream has been channelized to accommodate for the road and some bridge crossings.	1. Work with township and PennDOT to identify alternative methods of stabilization of the streambank. Possible Partners: WCD, DEP, Derry Township, City of Latrobe, PennDOT	Local, State	Low – Medium

SAXC *Main stem segment that flows through a forest and wetland area.*	The stream is braided throughout this section.	1. Investigate causes of braiding and determine the need/possibility of providing the stream with a more definitive channel through this area. Possible Partners: WCD, PAFBC, DEP	Local, State	Low
SAXD *Main stem section that flows through an area surrounded by residences, businesses, and road.*	Stream passes through a residential area where the streambank has been stabilized with rip rap and other materials. In addition, it is clear that the stream has been channelized to accommodate for the road and some bridge crossings.	1. Work with township and PennDot PennDOT to identify alternative methods of stabilization of the stream bank. Possible Partners: WCD, DEP, Derry Township, City of Latrobe, PennDotPennDOT	Local, State	Low
SAXE *The headwaters of the main stem that flows through a residential area in West Derry.*	Stream passes through a residential area where the streambank has been stabilized with rip rap and other materials. In addition, it is clear that the stream has been channelized to accommodate for the road and some bridge crossings.	1. Work with township and PennDOT to identify alternative methods of stabilization of the streambank. Possible Partners: WCD, DEP, Derry Township, City of Latrobe, PennDOT	Local, State	Low
SAXUNT4N *Small tributary that flows into Saxman Run near the headwaters in West Derry. It flows through a residential area*	Stream passes through a residential area where the streambank has been stabilized with rip rap and other materials. In addition, it is clear that the stream has been channelized to accommodate for the road and some bridge crossings.	1. Work with township and PennDOT to identify alternative methods of stabilization of the streambank. Possible Partners: WCD, DEP, Derry Township, City of Latrobe, PennDOT	Local, State	Low

LIMITING FACTOR: Nutrient Enrichment				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
SAXB *Main stem segment that flows through a residential area in Snydertown.*	Multiple pipes were located along the streambank that were discharging water with a bad odor into the stream.	1. Encourage landowners to utilize BMPs for managing septic systems. Possible Partners: WCD, PSCE, USDA RUS, City of Latrobe	State, Federal	Low
SAXE *The headwaters of the main stem that flows through a residential area in West Derry.*	Multiple pipes were located along the streambank that were discharging water with a bad odor into the stream.	1. Encourage landowners to utilize BMPs for managing septic systems. Possible Partners: WCD, PSCE, USDA RUS, City of Latrobe	State, Federal	Low – Medium
SAXUNT2NB *Headwater section of a tributary to Saxman Run that flows through fields and pasture.*	Significant algal growth noted. Stream substrate contains algae and macrophytes. Source of nutrient enrichment not known.	1. Determine nutrient enrichment source in order to develop course of action. Possible Partners: DEP, WCD	Local, State	Low
SAXUNT4N *Small tributary that flows into Saxman Run near the headwaters in West Derry. It flows through a residential area.*	Multiple pipes were located along the streambank that were discharging water with a bad odor into the stream.	1. Encourage landowners to utilize BMPs for managing septic systems. Possible Partners: WCD, PSCE, USDA RUS, Derry Township	State, Federal	Low

LIMITING FACTOR: Abandoned Mine Drainage				
Stream Segment Name	**Description of Impact**	**Remediation Strategy**	**Possible Funding Sources**	**Priority Rating**
SAXA *Main stem section that extends from the mouth of the stream to Snydertown. It is surrounded by a mix of forest, residences, industry, and Latrobe-Derry Road.*	Water is orange colored with some white as well. Substrate is more than 90% embedded with iron oxide sediment. Two major discharges, Lower Saxman and Upper Saxman, are located within this section of stream.	1. Remediate both discharges. 2. Increase community awareness about the challenge that exists due to AMD pollution. Possible Partners: WCD, WPC, DEP, OSM, USACE	Local, State, Federal, Private	High
SAXB *Main stem segment that flows through a residential area in Snydertown.*	Water is orange colored with some white as well. Substrate is more than 90% embedded with iron oxide sediment. Source of the sediment is the West Derry Discharge upstream.	1. Remediate the West Derry Discharge. 2. Increase community awareness about the challenge that exists due to AMD pollution. Possible Partners: WCD, WPC, DEP, OSM, USACE	Local, State, Federal, Private	High
SAXC *Main stem segment that flows through a forest and wetland area.*	Water is orange colored with some white as well. Substrate is more than 90% embedded with iron oxide sediment. Source of the sediment is the West Derry Discharge upstream.	1. Remediate the West Derry Discharge. 2. Increase community awareness about the challenge that exists due to AMD pollution. Possible Partners: WCD, WPC, DEP, OSM, USACE	Local, State, Federal, Private	High
SAXD *Main stem section that flows through an area surrounded by residences, businesses, and road.*	Water is orange colored with some white as well. Substrate is more than 90% embedded with iron oxide sediment. Source of the sediment is the West Derry Discharge upstream.	1. Remediate the West Derry Discharge. 2. Increase community awareness about the challenge that exists due to AMD pollution. Possible Partners: WCD, WPC, DEP, OSM, USACE	Local, State, Federal, Private	High