

South Fayette Visual Watershed Assessment

August 2013



Acknowledgements

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The views expressed herein are those of the author(s) and do not necessarily reflect the views of the Department of Environmental Protection.

This project was administered by the South Fayette Conservation Group (SFCG) - an award winning non-profit conservation and watershed group located in southern Allegheny County. Their mission is to conserve, protect and enhance the natural and recreational resources for the benefit of their families and neighbors.

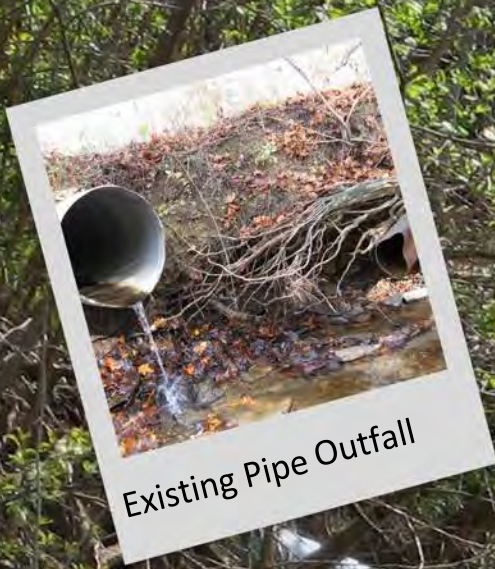
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The consultant for the completion of this project was Mackin Engineering Company (Mackin).

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Existing Pipe Outfall

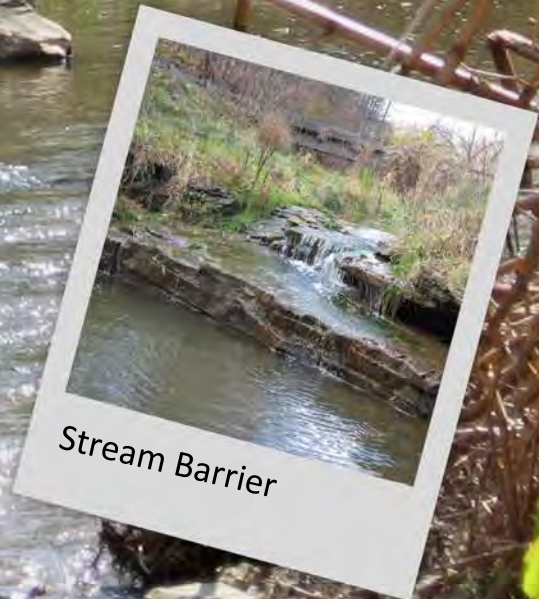


Bank Failure

Coal Run



Stream Barrier



Stream Barrier

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Coal Run

Headwaters—Coal Run begins in Cecil Township, Washington County.

Mouth—Coal Run empties into Chartiers Creek in South Fayette Township, Allegheny County. The confluence is surrounded by commercial and residential development.

Features—Coal Run has a Warm Water Fishes (WWF) Chapter 93 Management Designation and is not stocked by the PA Fish and Boat Commission.

The water quality for Coal Run is described in the report “Coal Run Abandoned Mine Drainage Monitoring Data: 2002-2004” which was prepared by Vintage - a nonprofit social service agency in Allegheny County that works with older adults to help them find ways to use their knowledge and talents - and the Pennsylvania Senior Environmental Corps from Allegheny County in June 2005.

Coal Run experiences multiple land uses adjacent to the channel from agricultural fields to residential yards to undeveloped intact forested areas. The diverse land uses result in a non-contiguous developed riparian zone that allows for excess nutrient and sedimentation to enter the channel resulting in algal blooms and other invasive biological growth. In addition, the interspersed riparian areas have led to areas of severe erosion along the channel.

One of the more prevalent land uses in this watershed is the 160 acre Hickory Heights Golf Club which opened in 1991 as part of a residential community. In 2009, new owners purchased the course and have eliminated sixteen fairway bunkers as well as 4,000 trees. Consistent with overall character of the watershed, Hickory Heights is known for its dramatic elevation changes and water hazards.

The combined sewer overflow system (CSO) crosses the stream in a number of areas and multiple road crossings with inverts that are not depressed below existing streambed grades have resulted in many barriers to fish passage in the channel.

Debris jams in the stream also contribute to erosion as the stream creates alternative channels. Regular monitoring and removal of these debris jams is a cost-effective way to reduce the risk to downstream residents and businesses.

Multiple sources of abandoned mine drainage (AMD) are evident within the channel.

Japanese knotweed has colonized large sections of Coal Run and should be addressed for several reasons. The damage Japanese knotweed causes to the environment led the World Conservation Union to include it on their list of the 100 worst invasive species on the planet. By preventing native vegetation from growing it reduces species diversity and has a negative impact on the balance of the ecosystem. The potential economic impact of knotweed along streams has not been published, but to the extent that it hinders the natural nutrient cycle of stream ecosystems, and excludes native woody plant stock, economic impact might be considered sizable.

Coal Run



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**South Fayette
Watersheds Visual Assessment**

Visual Assessment Results—Coal Run

Reach ID	Rating	Channel Condition	Riparian Zone	Bank Stability	Pools	Water Appearance	Nutrient Enrichment	Embeddedness	Fish Barriers	In Stream Cover	Canopy Cover	Macroinvertebrate Presence	Visual Assessment Score
CR-1	Fair	7	8	5	7	8	5	7	9	7	8	8	7.2
CR-2	Good	7	10	6	7	8	6	7	6	8	10	8	7.5
CR-3	Poor	3	5	5	6	6	3	2	3	4	2	4	3.9
CR-4	Poor	3	5	5	9	6	5	3	3	5	7	6	5.2
CR-5	Poor	5	5	3	4	6	6	2	7	4	5	5	4.7
CR-6	Fair	6	7	8	9	5	7	6	2	8	10	9	7.0
CR-7	Poor	1	1	1	4	3	8	2	2	2	7	6	3.4
CR-8	Poor	3	5	2	5	9	3	7	8	7	4	7	5.5

Coal Run



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South Fayette
Watersheds Visual Assessment

Field Observations

Stream Reach CR-1

Located upstream of the Interstate 79 crossing, this reach received an overall FAIR rating. The surrounding land use is moderately undisturbed except for the adjacent interstate. Some stream erosion was identified and an area of fencing in disrepair was noted. Algal growth was noted in some areas of the stream, possibly from concentrated run-off from the adjacent interstate.



Area of stream bank erosion (CR-1 Photo 2)



Failing fence (CR-1 Photo 5)

Visual Assessment
Rating

FAIR

Coal Run



Action Items

Action Item CR-1.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item CR-1.2: Repair or replace fencing

Contact the landowner or persons responsible for the fencing along this section. Discuss possibility of replacing fencing with natural stabilizing techniques for increased longevity and context sensitivity. These techniques include placing gabion walls or cribbing along the fenced area. If fencing remains the only option, talk to the landowner about repairing or replacing the fencing.

Action Item CR-1.3: Investigate source of algal growth

Observe patterns of the growth of algae in the channel. Is more identified after periods of high run off? Is more noted downstream of the runoff area from the interstate? Determine source of nutrient loading to the stream. The surrounding land use in this stream reach is forested, with the exception of the interstate. Evaluate improvements to the riparian area to retain additional nutrients especially during periods of high runoff.

GOOD

Stream Reach CR-2

Located upstream of the Interstate 79 crossing and Reach CR-1, this reach received an overall GOOD rating. The surrounding land use is in-tact forest and is undisturbed. Some minor erosion exists along the banks and a natural fish barrier was noted.



Natural log barrier to fish passage (CR-2 Photo 1)

Action Items

Action Item CR-2.1: Investigate removal of barrier to fish passage

Although likely impeding the passage of fish upstream, this barrier is likely acting as an in-stream structure reducing the velocity of the flow through this reach. Investigate the possibility of removing or adjusting the structure to act more like a cross vane or j-hook.

Action Item CR-2.2: Preserve or conserve reach

CR-2 received a good rating because of its healthy riparian zone, good canopy cover, and woody canopy cover. When evaluating projects for other reaches of Coal Run, this reach would be an acceptable reference reach to model other sections.

Coal Run



CR-9

POOR

Stream Reach CR-3

Reach CR-3 is a 0.9 mile length of Coal Run located in the middle of the stream in a heavily developed area adjacent to the Hickory Heights Golf Club development. This reach received a POOR rating. The overall channel condition is poor; moderate amounts of rip rap are present. The right downstream bank is forested and maintains a relatively intact riparian zone; however, the left downstream bank is adjacent to the golf club property and is mowed and subject to increased runoff and chemical application. Heavy algal growth and foamy water was noted. Multiple barriers to fish and other amphibious passage exist. Illegal dumping was also noted.



Concrete barrier (CR-3 Photo 15)



CMP Pipe outfall directly to Coal Run (CR-3 Photo 4)



Severe bedrock erosion (CR-3 Photo 6)



Mowed area adjacent to golf course in background (CR-3 Photo 21)



Golf Course Road Bridge; note failing gabion basket (CR-3 Photo 25)

Coal Run



Action Items

Action Item CR-3.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item CR-3.2: Improve riparian zone

Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a no-mow zone to encourage growth in these areas to retain nutrients and sediments.

Action Item CR-3.3: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging stormwater directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Action Item CR-3.4: Investigate concrete barriers

Some of the barriers present are concrete-encase CSO pipes that cross the stream. During the Act 537 planning process, provide Township with locations of the pipes and coordinate possible burying under the stream bed to provide passage for fish species in the stream.

Action Item CR-3.5: Repair failing gabion baskets under the golf course road bridge

Coordinate with the owner of the road/structure to repair the failing gabion baskets. Evaluate the feasibility of placing in-stream structures upstream to divert water flow away from gabions to reduce scouring and future damage.

Stream Reach CR-4

Reach CR-4 is located in the headwaters of Coal Run. Many headwater streams are scoured by ice in winter, flood in the spring and fall, and are dry in the summer. Wide variations in water flow and temperature make life difficult in headwater streams. A unique group of plants, amphibians, and insects are adapted to survive in these difficult conditions. These small streams also have a large impact on the health and integrity – both for water quality and wildlife – of major rivers downstream (UNH, 2011).

This segment received an overall POOR rating. Surrounding land use includes forested area, agricultural fields, and Coal Pit Run Road. Japanese knotweed was noted in this segment along with erosion and increased nutrient exposure, likely attributed to the agricultural fields and adjacent road.



Concrete encased pipe (CR-4 Photo 2)



Severe cut; erosion (CR-4 Photo 5)

Visual Assessment
Rating

POOR

Coal Run



CR-13

Action Items

Action Item CR-4.1: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item CR-4.2: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item CR-4.3: Approach adjacent landowners regarding agricultural BMP in the areas adjacent to the stream.

Identify landowners adjacent to the stream and provide education on the Best Management Practices for agricultural uses in the Township. Contact Penn State Cooperative Extension and the Allegheny County Conservation District for additional information.

Action Item CR-4.4: Improve riparian area to retain excess nutrients from the agricultural fields adjacent to stream.

Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments. In the agricultural areas with livestock, encourage fencing riparian areas to discourage livestock entry into the stream.

Action Item CR-4.5: Incorporate protection of headwater streams in to township and county planning.

Utilize township zoning ordinances and conservation easements to protect land surrounding headwater streams. Some sources suggest a minimum of 300 feet from the stream centerline; however, even moderate protection areas will improve water quality and reduce flooding downstream.

Stream Reach CR-5

Reach CR-5 is located in the headwaters of Coal Run. This segment received an overall POOR rating. Surrounding land use includes forested area and a residential neighborhood. Japanese knotweed was noted in this segment along with erosion and increased nutrient exposure, likely attributed to the lack of adequate riparian area in the residential neighborhood.



Mowed residential area (CR-5 Photo 2)



Sewer line crossing in stream (CR-5 Photo 1)

Visual Assessment
Rating

POOR

Coal Run



Action Items

Action Item CR-5.1: Improve riparian area to retain excess nutrients from the residential areas adjacent to stream.

Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Stream Reach CR-6

Reach CR-6 is located in the headwaters of Coal Run. This segment received an overall FAIR rating. The surrounding land use is moderately undisturbed with some intact forestland. Some moderate stream erosion was identified and an area of fencing in disrepair was noted.



Natural stream bottom barrier (CR-6 Photo 2)



One of many pipe outfalls in this reach (CR-6 Photo 8)

Visual Assessment
Rating

FAIR

Coal Run



CR-17

Action Items

Action Item CR-6.1: Enhance natural bedrock feature.

Although likely impeding the passage of fish upstream, this natural bedrock barrier would be difficult to remove. Investigate the use of in stream structures or energy dissipators to reduce velocity and increase habitat for fish.

Action Item CR-6.2: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging stormwater directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Stream Reach CR-7

Reach CR-7 is located at the mouth of Coal Run at its entry point into Chartiers Creek and maintains a POOR rating. CR-7 received the lowest reach rating along Coal Run as a result of its erosion, sewage seepage, AMD, barriers to fish passage. This section is largely located in a commercial area of the Township and has poor riparian coverage.

Within this reach, many pipe outfalls are present, ranging from metal to PVC materials.



Confluence of Coal Run and Chartiers Creek; note AMD (CR-7 Photo 1)



Severe erosion compromising bank stability and CSO System (CR-7 Photo 4)

Visual Assessment
Rating

POOR

Coal Run





CSO pipe crossing; concrete encased causing barrier to fish passage (CR-7 Photo 5)



Severe erosion causing bank instability and compromising CSO system lines (CR-7 Photo 6)



Collapsing retaining wall (CR-7 Photo 13)



Source of AMD (CR-7 Photo 17)

Action Items

Action Item CR-7.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item CR-7.2: Investigate source of AMD

Identify the sources of AMD that are identified within this stream reach and any mitigation measures being implemented to address the situation. The sources of AMD that are not being addressed should be prioritized and efforts undertaken to improve the present situation.

Action Item CR-7.3: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item CR-7.4: Investigate measures to reduce velocity and redirect flow away from existing exposed CSO manholes.

The use of j-hooks or other directional in-stream structures can be installed to redirect the flow from the manholes to reduce the erosive stress on these features.

Coal Run



Action Item CR-7.5: Improve riparian areas to reduce excess nutrients and sediment from entering channel from adjacent commercial development.

Identify landowners in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a no-mow zone to encourage growth in these areas to retain nutrients and sediments.

Action Item CR-7.6: Plant native shade trees along stream banks to reduce sun exposure and reduce water temperature in this section.

Grants are available to riparian plantings to reestablish healthy systems along damaged streambanks. Coordinate plantings through the Conservation Group or encourage a possible local business owners association to pool resources and improve the riparian zones in this section.

Action Item CR-7.7: Repair the retaining wall along Coal Pit Run Road

Coordinate with the owner of the road/structure to repair the retaining wall. Evaluate the feasibility of placing in-stream structures upstream to divert water flow away from gabions to reduce scouring and future damage.

Stream Reach CR-8

Reach CR-8 is located just upstream of the mouth of Coal Run at its entry point into Chartiers Creek and maintains a POOR rating. CR-8 is located in a residential section of the Township and has a compromised riparian area and bank stability issues. As in many areas, this reach is infested with Japanese knotweed. The Interstate 79 crossing over Coal Run has a concrete bottom that is likely impeding fish passage upstream.

Within this reach, many pipe outfalls are present, ranging from metal to PVC materials.



Interstate 79 crossing over Coal Run; note the concrete bottom barrier (CR-8 Photo 4)



Riparian area where improvements can be implemented (CR-8 Photo 1)

Visual Assessment
Rating

POOR

Coal Run



Action Items

Action Item CR-8.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item CR-8.2: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item CR-8.3: Improve riparian areas to reduce excess nutrients and sediment from entering channel from adjacent residential development.

Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item CR-8.4: Plant native shade trees along stream banks to reduce sun exposure and reduce water temperature in this section.

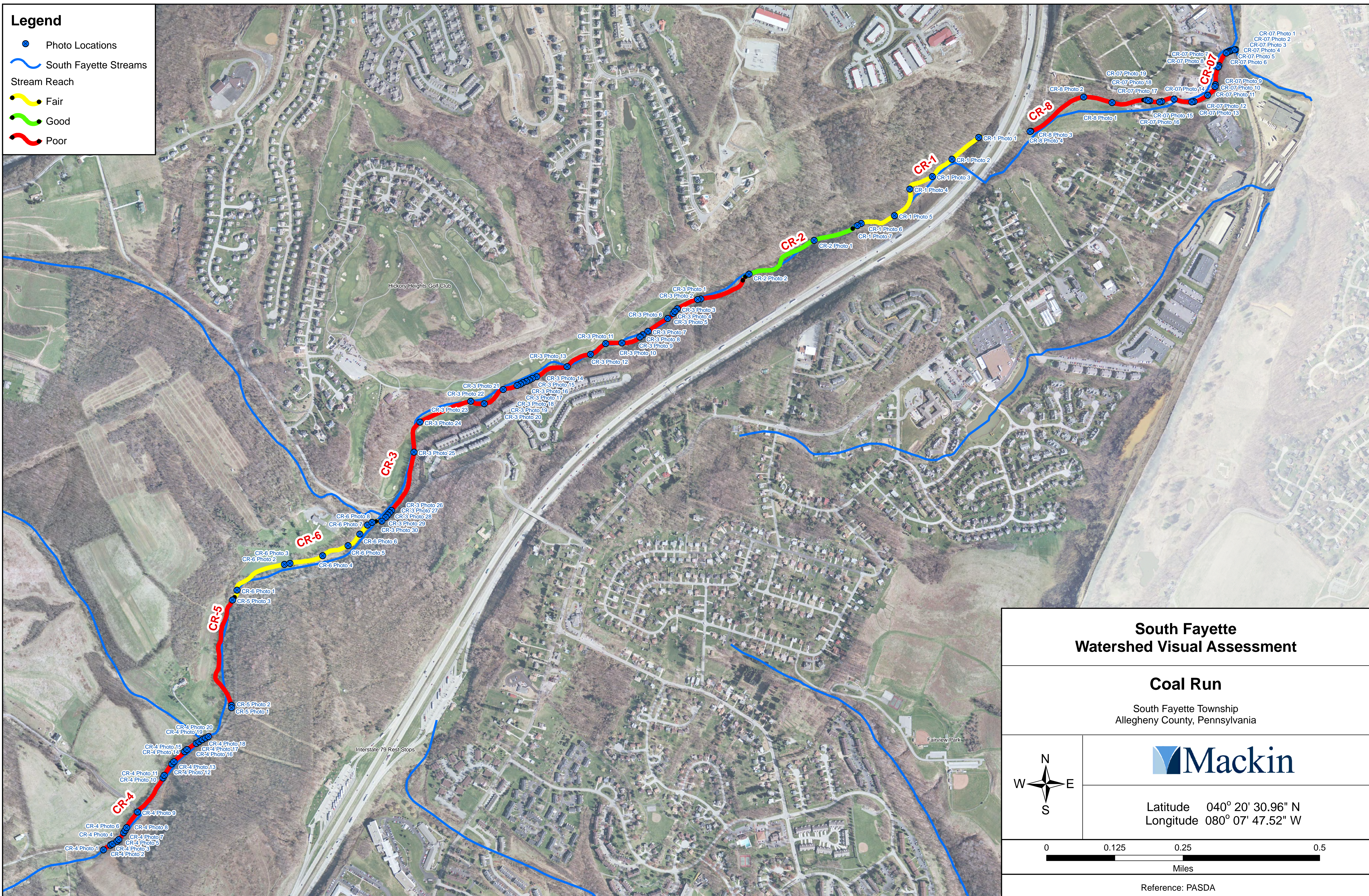
Grants are available to riparian plantings to reestablish healthy systems along damaged streambanks. Coordinate plantings through the Conservation Group or encourage a possible local business owners association to pool resources and improve the riparian zones in this section.

Action Item CR-8.5: Coordinate with PA Fish and Boat Commission to investigate methods to help facilitate fish passage at the I-79 crossing.

Coordination with PFBC can provide some ideas regarding the I-79 arch over Coal Run; possibilities may include a low flow channel within the arch, adding some rock aprons to the downstream end of the concrete. In addition, coordination with PennDOT should occur to determine if this structure is on the schedule for maintenance.

Legend

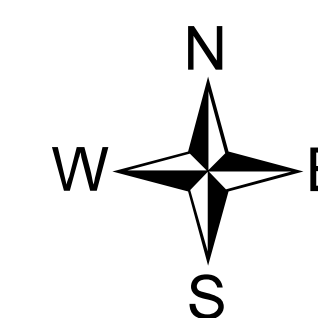
- Photo Locations
- South Fayette Streams
- Stream Reach
 - Fair
 - Good
 - Poor



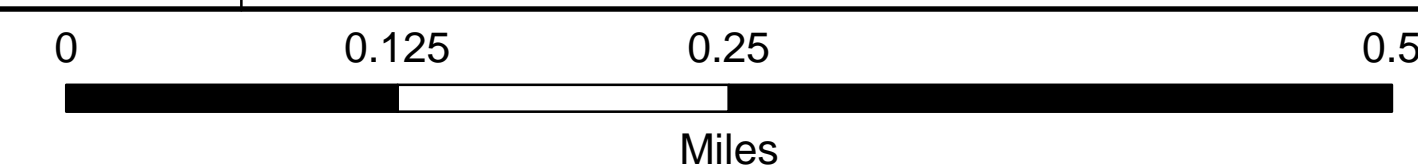
**South Fayette
Watershed Visual Assessment**

Coal Run

South Fayette Township
Allegheny County, Pennsylvania



Latitude 040° 20' 30.96" N
Longitude 080° 07' 47.52" W



Reference: PASDA



Bank Failure

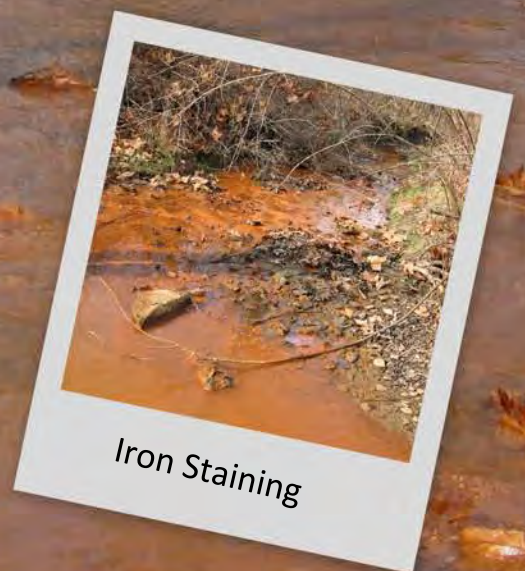


Bank Erosion

Millers Run



In Stream Algae



Iron Staining

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Millers Run

Headwaters—Millers Run begins in Mount Pleasant Township, Washington County.

Mouth—Millers Run empties into Chartiers Creek in South Fayette Township, Allegheny County. The confluence is surrounded by commercial development and open fields.

Features—Millers Run has a Warm Water Fishes (WWF) Chapter 93 Management Designation and is not stocked by the PA Fish and Boat Commission.

Similar to Coal Run, Millers Run experiences multiple land uses adjacent to the channel from agricultural fields to residential yards to undeveloped in tact forested areas. However, land surrounding Millers Run is much more developed than Coal Run resulting in a non-contiguous developed riparian zone that allows for excess nutrient and sedimentation to enter the channel resulting in algal blooms and other invasive biological growth. In addition, the interspersed riparian areas have led to areas of severe erosion along the channel.

The combined sewer overflow system (CSO) crosses the stream in a number of areas and multiple road crossings with invert that are not depressed below existing streambed grades have resulted in many barriers to fish passage in the channel.

Debris jams in the stream also contribute to erosion as the stream creates alternative channels. Regular monitoring and removal of these debris jams is a cost-effective way to reduce the risk to downstream residents and businesses.

Multiple sources of abandoned mine drainage (AMD) are evident within the channel.

Japanese knotweed has colonized large sections of Millers Run and should be addressed for several reasons. The damage Japanese knotweed causes to the environment led the World Conservation Union to include it on their list of the 100 worst invasive species on the planet. By preventing native vegetation from growing it reduces species diversity and has a negative impact on the balance of the ecosystem. The potential economic impact of knotweed along streams has not been published, but to the extent that it hinders the natural nutrient cycle of stream ecosystems, and excludes native woody plant stock, economic impact might be considered sizable.

The South Fayette Conservation Group has undertaken a number of projects to improve the quality of Millers Run. They include the construction of eight fish habitat structures; the Fishing Run Stream Sealing project; a design option for the Gladden Discharge Passive Treatment System; and The Fishing Run Restoration and Maude Mine Reclamation Project. Each of these projects is explained in detail in the Appendices.

Millers Run



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**South Fayette
Watersheds Visual Assessment**

Visual Assessment Results—Millers Run

Reach ID	Rating	Channel Condition	Riparian Zone	Bank Stability	Pools	Water Appearance	Nutrient Enrichment	Embeddedness	Fish Barriers	In Stream Cover	Canopy Cover	Macroinvertebrate Presence	Visual Assessment Score
MR-1	Fair	4	6	4	8	8	8	8	10	8	6	6	6.7
MR-2	Poor	2	4	3	9	8	7	5	10	4	4	3	5.7
MR-3	Poor	3	6	2	6	8	8	4	9	7	7	3	5.7
MR-4	Poor	1	1	8	5	3	8	5	9	8	4	3	5.4
MR-5	Poor	4	5	4	2	2	8	4	9	4	5	2	4.5
MR-6	Poor	1	2	2	5	2	8	3	1	4	6	2	3.5
MR-7	Poor	1	4	1	8	2	8	4	9	2	2	2	3.9
MR-8	Poor	3	5	4	3	3	8	4	9	3	3	3	4.5
MR-9	Poor	5	5	5	3	3	8	6	9	4	4	3	5
MR-10	Poor	3	5	5	4	3	8	5	9	5	9	5	5.8
MR-11	Poor	4	3	5	5	3	8	5	9	5	2	4	4.9
MR-12	Poor	6	3	4	8	2	5	5	3	10	8	6	5.4
MR-13	Good	8	9	9	10	8	8	9	1	10	10	10	8.4

Millers Run



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Field Observations

Stream Reach MR-2

Located adjacent to the outdoor soccer fields, this reach received an overall POOR rating. The surrounding land use is moderately undisturbed except for the soccer fields. Some stream erosion was identified and an area of rip rap was noted. Staining from AMD was noted on the water line of the rip rap. Algal growth was noted in some areas of the stream, possibly from concentrated run-off from the adjacent field.



Area of stream bank erosion (MR-2 Photo 2)



Rip rap and AMD staining (MR-2 Photo 3)

Visual Assessment
Rating

POOR

Millers Run



Action Items

Action Item MR-2.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-2.2: Investigate source of AMD

Identify the sources of AMD that are identified within this stream reach and any mitigation measures being implemented to address the situation. The sources of AMD that are not being addressed should be prioritized and efforts undertaken to improve the present situation.

Action Item MR-2.3: Investigate source of algal growth

Observe patterns of the growth of algae in the channel. Is more identified after periods of high run off? Is more noted downstream of the runoff area from the interstate? Determine source of nutrient loading to the stream. The surrounding land use in this stream reach is forested, with the exception of the interstate. Evaluate improvements to the riparian area to retain additional nutrients especially during periods of high runoff.

POOR

Stream Reach MR-3

Located upstream of Reach MR-3, this reach received an overall POOR rating. SR50 is located west of the former manufacturing facility. Severe erosion exists along the banks and a debris jam was noted causing a diversion of the stream channel.



Debris jam (MR-3 Photo 6)

Action Items

Action Item MR-3.1: Investigate removal of the debris jam that is causing a barrier to fish passage and a diversion of the stream channel.

Remove debris to allow stream to resume natural course. Bank stabilization techniques should be investigated for installation in this reach as well.

Action Item MR-3.2: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-3.3: Investigate source of AMD

Identify the sources of AMD that are identified within this stream reach and any mitigation measures being implemented to address the situation. The sources of AMD that are not being addressed should be prioritized and efforts undertaken to improve the present situation.

Millers Run



POOR

Stream Reach MR-4

Like MR-3, Reach MR-4 is located adjacent to the former manufacturing facility and crosses under the railroad and Millers Run Road. This reach received a POOR rating. The overall channel condition is deeply channelized with continual lengths of retaining walls. The left downstream bank is forested and maintains a relatively intact riparian zone; however, the right downstream bank is adjacent to the former manufacturing facility and is subject to increased runoff. Evidence of AMD is prevalent throughout all reaches of the stream.



Deeply channeled (MR-4 Photo 10)



Retaining walls (MR-4 Photo 4)

Action Items

Action Item MR-4-1: Investigate source of AMD

The "Gladden Discharge" is a source point for abandoned mine drainage pollution, located on private property at the bottom of a steep hillside in the Gladden area of South Fayette Township. The Gladden discharge was the primary pollutant in the Lower Chartiers Creek Watershed contributing 60% of the iron loading and 70% of the acidity loading.

In 2009, The South Fayette Conservation Group completed a design option for the Gladden Discharge Passive Treatment System. Further surface stream loss remediation work within the mine pool area is being proposed by the South Fayette Conservation Group prior to application for construction funding of the treatment system. This additional work could result in an added benefit of reducing the treatment size to a point where the system would sufficiently restore Millers Run, a major goal of the SFCG and the PA DEP.

Action Item MR-4.2: Improve riparian zone

Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope or providing a benched floodplain, planting with native shade trees, and allowing for a "no-mow" zone to encourage growth in these areas to retain nutrients and sediments.

Action Item MR-4.3: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging stormwater directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Action Item MR-4.4: Improve in-stream habitat conditions

Investigate the use of j-hooks, cross vanes, step pools, or other types of in-stream structures to provide cover; and feeding, resting, and breeding areas.

Millers Run



Stream Reaches MR-5, MR-6, and MR-7

Reaches MR-5, MR-6, and MR-7 are located adjacent to SR50. These reaches received a POOR rating. The overall channel condition is deeply channelized with continual lengths of retaining walls. The left downstream bank is forested and maintains a relatively intact riparian zone; however, the right downstream bank is adjacent to the former manufacturing facility and is subject to increased runoff. Japanese knotweed and Multiflora Rosa was noted in these segments. Evidence of AMD is prevalent throughout all reaches of the stream.



Steep banks/Incised channel (MR-5 Photo 7)



Biological sheen from AMD (MR-5 Photo 8)



Deep pools (MR-6 Photo 23)



Obstructions (MR-6 Photo 25)



Severe Erosion (MR-6 Photo 16)

Millers Run





Severe Erosion (MR-7 Photo 6)



Sediment Deposition (MR-6 Photo 14)



Exposed Pipes (MR-6 Photo 16)

Action Items

Action Item MR-5/6/7.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-5/6/7.2: Improve riparian zone

Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope or floodplain benching techniques, planting with native shade trees, and allowing for a no-mow zone to encourage growth in these areas to retain nutrients and sediments.

Action Item MR-5/6/7.3: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging stormwater directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Action Item MR-5/6/7.4: Implement measures to eradicate or manage invasive species.

Both Japanese knotweed and Multiflora rose is present in these three reaches. Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item MR-5/6/7.5: Investigate removal of multiple debris jams or fallen trees

Although likely impeding the passage of fish upstream, these barriers are likely acting as in-stream structures reducing the velocity of the flow through this reach. Investigate the possibility of removing or adjusting the barriers to act more like a cross vane or j-hook.

Action Item MR-5/6/7.6: Investigate source of AMD

Identify the sources of AMD that are identified within this stream reach and any mitigation measures being implemented to address the situation. The sources of AMD that are not being addressed should be prioritized and efforts undertaken to improve the present situation.

Millers Run



Stream Reaches MR-8 and MR-9

Reaches MR-8 and MR-9 are near the middle of Millers Run and maintain a POOR rating. Although the left downstream bank in these reaches is less developed, it shows heavy erosion as it is on the outside of the meander; however, the right downstream bank in this area is adjacent to development allowing little room for riparian improvement. Sediment deposition is present along the right downstream area of the channel. Again, AMD is prevalent in this stream.



Unstable banks (MR-8 Photo 10)



Deposition (MR-9 Photo 3)

Action Items

Action Item MR-8/9.1: Narrow the stream channel in these reaches

Evaluate in-stream structures, such as deflectors, to narrow the channel through these reaches. Deflectors will allow for sediment build-up downstream of the deflectors effectively narrowing the channel. Typically, pairs of deflectors are installed every seven times the average stream width in the reach.

Action Item MR-8/9.2: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-8/9.3: Investigate source of AMD

Identify the sources of AMD that are identified within this stream reach and any mitigation measures being implemented to address the situation. The sources of AMD that are not being addressed should be prioritized and efforts undertaken to improve the present situation.

Action Item MR-8/94: Implement measures to eradicate or manage invasive species.

Both Japanese Knotweed and Multiflora Rosa are prevalent in these reaches. Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese Knotweed along the streambanks.

Action Item MR-8/9.5: Investigate measures to reduce velocity and redirect flow away from existing exposed CSO manholes.

The use of j-hooks or other directional in-stream structures can be installed to redirect the flow from the manholes to reduce the erosive stress on these features.

Action Item MR-8/9.6: Improve riparian areas to reduce excess nutrients and sediment from entering channel from adjacent commercial development.

Identify landowners in this section. The recreational area in these reaches may be a good place for riparian improvements. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item MR-8/9.7: Plant native shade trees along stream banks to reduce sun exposure and reduce water temperature in this section.

Grants are available to riparian plantings to reestablish healthy systems along damaged streambanks. Coordinate plantings through the Conservation Group or encourage a possible local business owners association to pool resources and improve the riparian zones in this section.

Millers Run



Stream Reach MR-10

Reach MR-10 is located in a commercial area adjacent to parking lots with vehicles parked immediately streamside and maintains a POOR rating. MR-10 has a compromised riparian area along the right downstream bank, bank stability issues, and areas of illegal dumping. As in many areas, this reach has Japanese knotweed present along the banks.

Within this reach, many pipe outfalls are present, ranging from metal to PVC materials that appear to have a higher concentration of AMD than the stream itself.



Severe erosion (MR-10 Photo 18)



AMD problem with sulfur smell (MR-10 Photo 8)



Obstructions (MR-10 Photo 14)



Foam at pipe discharge (MR-10 Photo 13)



Vehicles adjacent to stream (MR-10 Photo 19)

Millers Run



MR-19

Action Items

Action Item MR-10.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-10.2: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item MR-10.3: Improve riparian areas to reduce excess nutrients and sediment from entering channel from adjacent commercial development.

Oil sheen is identified in this reach; identify source of sheen discriminating between true oil residue possibly from the adjacent parking lot or a type of iron bacteria intertwined with the presence of AMD. Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a no-mow zone to encourage growth in these areas to retain nutrients and sediments.

Action Item MR-10.4: Plant native shade trees along stream banks to reduce sun exposure and reduce water temperature in this section.

Grants are available to riparian plantings to reestablish healthy systems along damaged streambanks. Coordinate plantings through the Conservation Group or encourage a possible local business owners association to pool resources and improve the riparian zones in this section.

Action Item MR-10.5: Coordinate with PA Fish and Boat Commission to investigate methods to help facilitate fish passage at the I-79 crossing.

Coordination with PFBC can provide some ideas regarding the I-79 arch over Coal Run; possibilities may include a low flow channel within the arch, adding some rock aprons to the downstream end of the concrete. In addition, coordination with PennDOT should occur to determine if this structure is on the schedule for maintenance.

Action Item MR-10.5: Identify source of oily sheen.

Oil sheen is identified in this reach; identify source of sheen discriminating between true oil residue possibly from the adjacent parking lot or a type of iron bacteria intertwined with the presence of AMD. If it is found to be true oil, then approach adjacent landowners regarding the location of vehicles and the enhancement of the riparian area.

Stream Reach MR-11

Reach MR-11 is situated where the left downstream bank is commercial and right downstream bank is forested. This reach maintains a POOR rating. As in many areas, Japanese knotweed is present in this reach. Near the upstream end of the reach, a concrete bottom that is likely impeding fish passage upstream is present. Erosion is prevalent along the right downstream bank and the riparian zone is compromised along the left downstream bank through most of the reach. Again, AMD is present along with the foam and oily sheen, as in most of Millers Run.

Within this reach, many pipe outfalls are present, ranging from metal to PVC materials and several are in disrepair.



Erosion (MR-11 Photo 8)



Obstructions (MR-11 Photo 18)

Visual Assessment
Rating

POOR

Millers Run



Action Items

Action Item MR-11.1: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-11.2: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item MR-11.3: Improve riparian areas to reduce excess nutrients and sediment from entering channel from adjacent commercial development.

Oil sheen is identified in this reach; identify source of sheen discriminating between true oil residue possibly from the adjacent parking lot or a type of iron bacteria intertwined with the presence of AMD. Identify landowners along the left downstream bank in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a no-mow zone to encourage growth in these areas to retain nutrients and sediments.

Action Item MR-11.4: Plant native shade trees along stream banks to reduce sun exposure and reduce water temperature in this section.

Grants are available to riparian plantings to reestablish healthy systems along damaged streambanks. Coordinate plantings through the Conservation Group or encourage a possible local business owners association to pool resources and improve the riparian zones in this section.

Action Item MR-11.5: Identify source of oily sheen.

Oil sheen is identified in this reach; identify source of sheen discriminating between true oil residue possibly from the adjacent parking lot or a type of iron bacteria intertwined with the presence of AMD. If it is found to be true oil, then approach adjacent landowners regarding the location of vehicles and the enhancement of the riparian area.

Action Item MR-11.6: Investigate removal of barrier to fish passage

Although likely impeding the passage of fish upstream, this barrier is likely acting as an in-stream structure reducing the velocity of the flow through this reach. Investigate the possibility of removing or adjusting the structure to act more like a cross vane or j-hook.

Stream Reach MR-12

Reach MR-12 begins immediately downstream of the SR50 structure and continues to the Morgan Hollow Road structure. This reach has a POOR rating. MR-12 is located in a combined commercial and residential section of the Township and has a compromised riparian area and bank stability issues. As in many areas, this reach experiences a Japanese knot- weed population. Multiple tributaries and seeps enter Millers Run in this reach and many are a contributing source of AMD to the stream, including the Gladden discharge, Dolphin Run, and an unnamed seep.

Within this reach, many pipe outfalls are present, ranging from metal to PVC materials and several are in disrepair.



Dolphin Run entering (MR-12 Photo 7)



AMD seep (MR-12 Photo 9)

Visual Assessment
Rating

POOR

Millers Run



South Fayette
Watersheds Visual Assessment



Fishing Run entering (MR-12 Photo 10)



Gladden discharge (MR-12 Photo 15)

Action Items

Action Item MR-12.1: Investigate source of AMD

It appears that the major contributors of AMD into Millers Run are located within this reach. The Fishing Run Stream Sealing Project is an extension of the Fishing Run Restoration/Maude Mine Reclamation Project and Gladden Discharge Passive Treatment System Design Project. Currently, the SFCG plans on restoring approximately 5,500 feet of stream channel using Fabriform Liners. Restoring the water flow to the surface in these stream areas will further reduce the flow and the amount of contaminants at the Gladden Discharge, which continues to be the primary pollutant of Millers Run. Several areas have been identified for remediation and design options are being prepared for submission to the DEP for permitting.

Action Item MR-12.2: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item MR-12.3: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item CR-7.5: Improve riparian areas to reduce excess nutrients and sediment from entering channel from adjacent commercial development.

Identify landowners in this section. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item CR-7.6: Plant native shade trees along stream banks to reduce sun exposure and reduce water temperature in this section.

Grants are available to riparian plantings to reestablish healthy systems along damaged streambanks. Coordinate plantings through the Conservation Group or encourage a possible local business owners association to pool resources and improve the riparian zones in this section.

Action Item MR-12.7: Investigate pipe outfalls

There are multiple outfalls in this reach that may not be storm related. Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. And, to address the outfalls that do carry strictly stormwater, avoid directly discharging stormwater directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Millers Run



Stream Reach MR-13

Reach CR-8 is located just upstream of the mouth of Coal Run at its entry point into Chartiers Creek and maintains a POOR rating. CR-8 is located in a residential section of the Township and has a compromised riparian area and bank stability issues. As in many areas, this reach is infested with Japanese knotweed. The Interstate 79 crossing over Coal Run has a concrete bottom that is likely impeding fish passage upstream.

Within this reach, many pipe outfalls are present, ranging from metal to PVC materials.



Sewer line crossing (MR-13 Photo 3)



PA 50 Bridge and spillway (MR-13 Photo 8)

Action Items

Action Item MR-13.1: Preserve or conserve reach.

MR-13 received a good rating because of its healthy riparian zone, good canopy cover, macroinvertebrate habitat, and overall good channel condition. This reach is not experiencing the erosion, lack of healthy riparian area, AMD, and pipe outfalls that face the downstream reaches of Millers Run. When evaluating projects for other reaches of Millers Run, this reach would be an acceptable reference reach to model other sections.

Action Item MR-13.2: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

There are several colonies of Japanese knotweed in this reach. Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese knotweed along the streambanks.

Action Item MR-13.3 Enhance natural bedrock features.

Although likely impeding the passage of fish upstream, this natural bedrock barrier would be difficult to remove. Investigate the use of in stream structures or energy dissipaters to reduce velocity and increase habitat for fish.

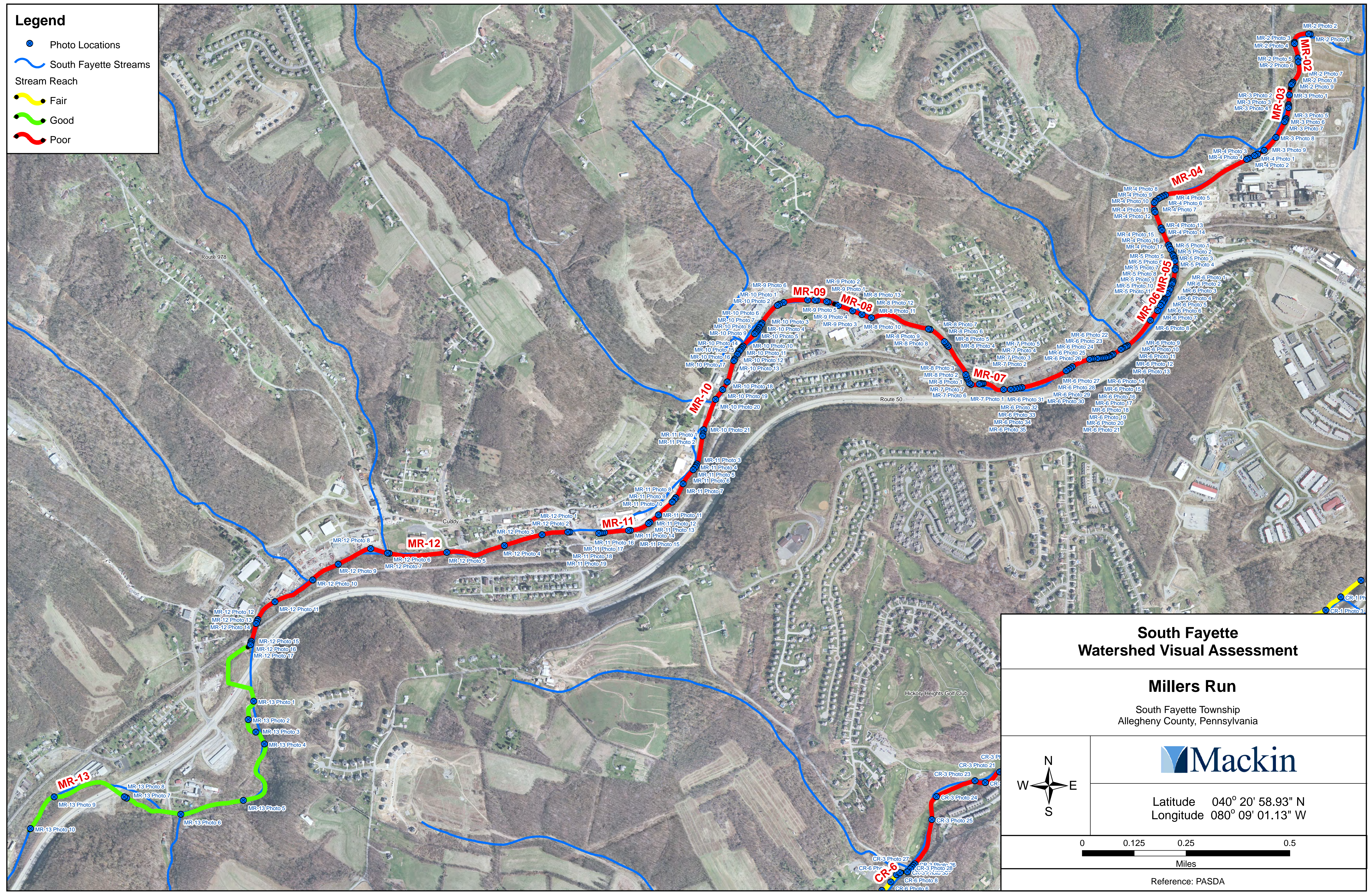
Millers Run



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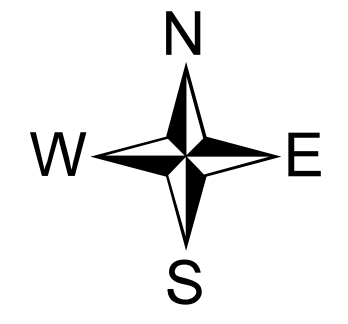
- Photo Locations
- South Fayette Streams
- Stream Reach
 - Fair
 - Good
 - Poor



**South Fayette
Watershed Visual Assessment**

Millers Run

South Fayette Township
Allegheny County, Pennsylvania



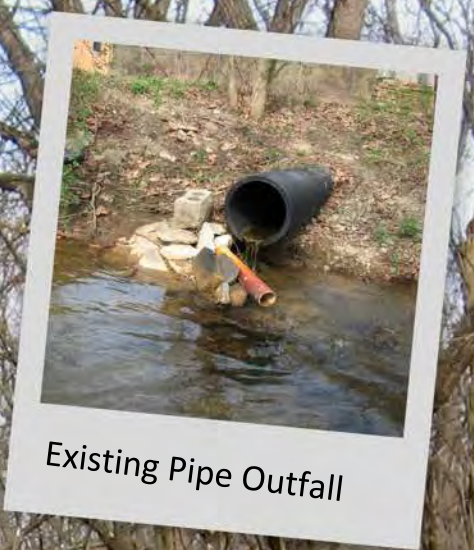
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Longitude 080° 09' 01.13" W



Reference: PASDA



Poor Riparian Area



Existing Pipe Outfall

Robinson Run



Stream Barrier



Retaining Wall

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Robinson Run

Headwaters—Robinson Run begins in Robinson Township, Washington County near Midway.

Mouth—Robinson Run empties into Chartiers Creek in Collier Township, Allegheny County, near Glendale. The confluence is surrounded by commercial and industrial development.

Features—Robinson Run has a Warm Water Fishes (WWF) Chapter 93 Management Designation and is not stocked by the PA Fish and Boat Commission.

Robinson Run experiences multiple land uses adjacent to the channel from residential yards to commercial and light industrial development areas to undeveloped in-tact forested areas. The Panhandle Trail follows the stream for most of its reach through the Township. The diverse land uses result in a non-contiguous developed riparian zone that allows for excess nutrient and sedimentation to enter the channel resulting in algal blooms and other invasive biological growth. In addition, the interspersed riparian areas have led to areas of severe erosion along the channel.

The combined sewer overflow system (CSO) crosses the stream in a number of areas and multiple road crossings with inverts that are not depressed below existing streambed grades have resulted in many barriers to fish passage in the channel.

Debris jams in the stream also contribute to erosion as the stream creates alternative channels. Regular monitoring and removal of these debris jams is a cost-effective way to reduce the risk to downstream residents and businesses.

Multiple sources of abandoned mine drainage (AMD) are evident within the channel.

Japanese knotweed has colonized large sections of Coal Run and should be addressed for several reasons. The damage Japanese knotweed causes to the environment led the World Conservation Union to include it on their list of the 100 worst invasive species on the planet. By preventing native vegetation from growing it reduces species diversity and has a negative impact on the balance of the ecosystem. The potential economic impact of knotweed along streams has not been published, but to the extent that it hinders the natural nutrient cycle of stream ecosystems, and excludes native woody plant stock, economic impact might be considered sizable. In addition, honeysuckle and multiflora rose are present along most of the reaches evaluated in this study.

Robinson Run



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**South Fayette
Watersheds Visual Assessment**

Visual Assessment Results—Robinson Run

Reach ID	Rating	Channel Condition	Riparian Zone	Bank Stability	Pools	Water Appearance	Nutrient Enrichment	Embeddedness	Fish Barriers	In Stream Cover	Canopy Cover	Macroinvertebrate Presence	Visual Assessment Score
RR-1	Good	9	9	9	10	8	6	5	8	10	7	9	8.1
RR-2	Poor	9	2	4	4	7	8	3	10	7	3	5	5.6
RR-3	Poor	7	2	3	4	8	7	4	9	8	3	5	5.3
RR-4	Poor	4	3	2	9	7	5	8	9	2	2	4	5.1
RR-5	Fair	6	6	7	9	7	4	8	3	7	6	8	6.5
RR-6	Fair	7	6	6	9	2	4	5	9	9	6	6	6.2
RR-7	Fair	5	2	2	9	8	5	7	8	8	6	8	6.3
RR-8	Poor	7	5	2	8	3	3	5	7	7	2	5	4.7
RR-9	Poor	7	7	3	5	8	6	2	1	6	8	5	5.1
RR-10	Poor	8	3	5	5	5	3	5	9	6	2	4	4.7

Robinson Run



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Field Observations

Stream Reach RR-1

Located near the Panhandle Trail in South Fayette Township, this reach received an overall GOOD rating. The surrounding land use is forested and virtually undeveloped. Some beaver activity and barriers to fish passage were noted. Algal growth was noted in some areas of the stream.



Natural dam (RR-1 Photo 2)



Beaver problem (RR-1 Photo 7)

Visual Assessment
Rating

GOOD

Robinson Run



Action Items

Action Item RR-1.1: Preserve or conserve reach

RR-1 received a good rating because of its healthy riparian zone, woody canopy cover, and stable stream banks. When evaluating other projects for Robinson Run, this reach would be an acceptable reference reach to model other sections.

Action Item RR-1.2: Investigate removal of barriers to fish passage

Although likely impeding the passage of fish upstream, these barriers are likely acting as in-stream structures reducing the velocity of the flow through this reach. Investigate the possibility of removing or adjusting the structure to act more like a cross vane or j-hook.

Action Item RR-1.3: Implement measures to eradicate or manage invasive species, notably multiflora rose and honeysuckle

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of invasives along the stream banks.

POOR

Stream Reach 2 and 3

Located along the Panhandle Trail extending to Oakdale, these two reaches received an overall POOR rating. The surrounding land use is some in-tact forest and commercial development closer to Oakdale along the right downstream bank and commercial and industrial along the left downstream bank. Within this reach, many pipe outfalls are present, ranging from metal to PVC materials. Invasive species, including Japanese knotweed, honeysuckle, and multiflora rose is widespread along these reaches. A prevalence of silt present in the stream bottom was noted in these sections.



Broken Pipes (RR-2 Photo 1)



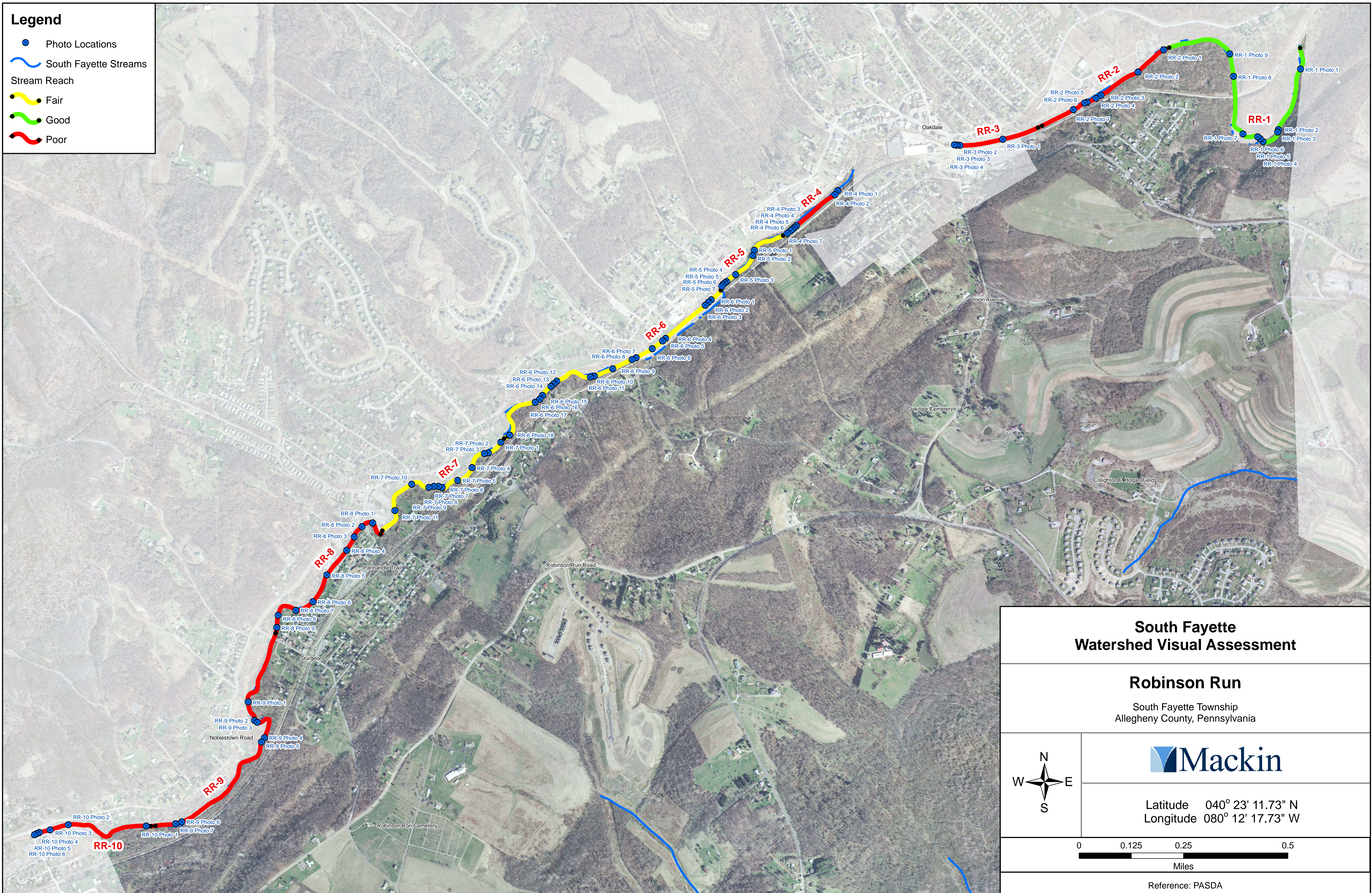
Artificial Tributary (RR-3 Photo 2)

Robinson Run



Legend

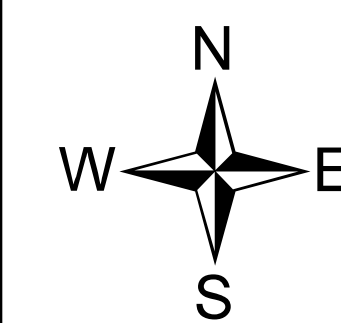
- Photo Locations
- ~ South Fayette Streams
- Stream Reach
 - Fair
 - Good
 - Poor



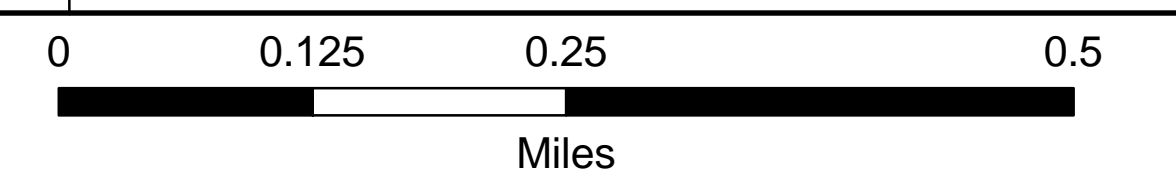
**South Fayette
Watershed Visual Assessment**

Robinson Run

South Fayette Township
Allegheny County, Pennsylvania



Latitude 040° 23' 11.73" N
Longitude 080° 12' 17.73" W



Reference: PASDA



Pipe Outfall (RR-2 Photo 5)



Poor Riparian Area (Robinson Run 1 019)



Japanese Knotweed prevalence (RR-3 Photo 3)

Action Items

Action Item RR-2/3.1: Investigate broken and abandoned pipes

Coordinate with local water and sewer authorities to determine ownership of abandoned and/or cracked pipes in this reach. Discuss possibilities to repair or remove pipes.

Action Item RR-2/3.2: Implement measures to eradicate or manage invasive species, notably Multiflora Rosa, honeysuckle, and Japanese Knotweed

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of invasives along the stream banks.

Action Item RR-2/3.3: Improve riparian area to retain excess nutrients from the residential, commercial, and light industrial areas adjacent to stream

Identify landowners along the stream banks. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item RR-2/3.4: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging storm water directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Action Item RR-2/3.5: Investigate measures to reduce sediment load in these reaches

Some areas experience reduced capacity to retain water during high flow events. Investigate areas upstream to install velocity reducing instruments to reduce sedimentation in these two reaches.

Robinson Run



POOR

Stream Reach 4

Reach RR-4 is a short stream segment that received an overall POOR rating. The surrounding land use is commercial along the right downstream bank and the Panhandle Trail is located along the left downstream bank. Stabilization techniques appear to be used to stabilize the trail alignment; however, the resulting stream bank is bare and allows for loose sediment to enter the channel. The reach lacks a vital riparian area, has multiple areas of unstable stream banks, and evidence of AMD is apparent at multiple spots along the short reach.



Trail stabilization (RR-4 Photo 2)



Mine discharge (RR-4 Photo 5)

Action Items

Action Item RR-4.1: Improve riparian area to retain excess nutrients from the residential, commercial, and light industrial areas adjacent to stream

Identify landowners along the stream banks. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item RR-4.2: Implement measures to eradicate or manage invasive species, notably Japanese Knotweed

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of invasives along the stream banks.

Action Item RR-4.3: Improve trail stabilization areas

Coordinate with Montour Trail Council to investigate a partnership to vegetate the barren areas where it appears that the trail corridor has been stabilized along Robinson Run. Varying types of planted vegetation would reduce the volume of sediment that enters the stream during rain events.

Robinson Run



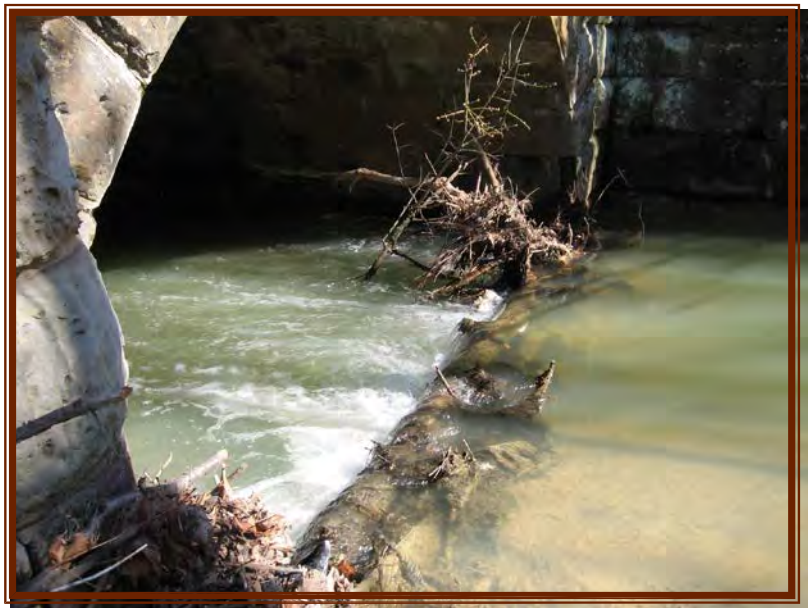


Stream Reach 5 and 6

Reaches RR-5 and 6 are located along the Panhandle Trail and within commercial, residential, and light industrial areas. These sections are experiencing poor riparian zones, compromised stream banks, and an influx of sewerage from the neighboring developments. Japanese Knotweed is also prevalent in these sections.



One of many outfalls in reaches (RR-5 Photo 3)



Fish barrier (RR-5 Photo 7)



Natural blockage (RR-6 Photo 1)



One of many crossings (RR-6 Photo 4)



Retaining wall in poor condition (RR-5 Photo 5)

Robinson Run



RR-15

Action Items

Action Item RR-5/6.1: Investigate removal of barriers to fish passage

Although likely impeding the passage of fish upstream, these barriers are likely acting as in-stream structures reducing the velocity of the flow through this reach. Investigate the possibility of removing or adjusting the structure to act more like a cross vane or j-hook.

Action Item RR-5/6.2 Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging storm water directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Some of the barriers present are concrete-encase CSO pipes that cross the stream. During the Act 537 planning process, provide Township with locations of the pipes and coordinate possible burying under the stream bed to provide passage for fish species in the stream.

Action Item RR-5/6.3 Awareness of bridge/culvert maintenance schedules

Coordinate with the township and PennDOT District 11-0 to determine if any of the structures are on the maintenance plan. Encourage early discussions to make officials aware of issues surrounding the structures so design plans incorporate findings of this and subsequent reports/monitoring events.

Action Item RR-5/6.4 Repair or replace stone retaining wall

Contact the landowner or persons responsible for the retaining wall within this section. Discuss possibility of repairing the existing wall or replacing with natural stabilization techniques for increased longevity and context sensitivity. These techniques include placing gabion walls or cribbing to encourage natural drainage and vegetation establishment.

Action Item RR-5/6.5 Reestablish floodplain

Along areas where channelization is occurring due to the stone walls in place on the left downstream bank, coordinate with adjacent landowners to determine if it possible to reestablish a floodplain along the right downstream bank. In-stream structures can be incorporate to force a sinuous flow that will encourage natural scouring and deposition to attempt to reestablish a stream meander in this area.

Stream Reach 7

Reach RR-7 is short reach that received an overall POOR rating. Surrounding land use includes forested area, residential, and light industrial areas. The Panhandle Trail is along the right downstream bank of the stream. Poor riparian areas and destabilized stream banks are prevalent through the reach. Japanese knotweed was noted in this segment as well as areas of grey water probably attributed to unregulated sewerage outflows. There is a significant amount of debris along this stretch of the channel.



Tributary with cloudy flow (RR-8 Photo 1)



Drainage (RR-8 Photo 5)

Visual Assessment
Rating

POOR

Robinson Run



South Fayette
Watersheds Visual Assessment



Bank erosion (RR-7 Photo 6)



Trash (RR-7 Photo 5)

Action Items

Action Item RR-7.1: Improve riparian area to retain excess nutrients from the residential, commercial, and light industrial areas adjacent to stream

Identify landowners along the stream banks. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item RR-7.2: Implement measures to eradicate or manage invasive species, notably Japanese Knotweed

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of invasives along the stream banks.

Action Item RR-7.3: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item RR-7.4: Remove debris

Identify landowners to remove trash and debris along stream bank areas. Coordinate an effort with the Conservation Group and other volunteers to have trash removal/stream clean up days to alleviate the debris problem in this area.

Robinson Run



POOR

Stream Reach 8

Reach RR-8 is received an overall POOR rating. The surrounding land use has commercial and residential developments. In this section, the stream is no longer adjacent to the Panhandle Trail. Bank erosion and poor riparian areas are noted in this reach along with a lack of canopy cover and evidence of sewerage entering the stream. Japanese knotweed is present on both stream banks along this reach.



One of many outfalls (RR-8 Photo 3)



Multiple stream crossings in section (RR-8 Photo 9)

Action Items

Action Item RR-8.1: Improve riparian area to retain excess nutrients from the residential, commercial, and light industrial areas adjacent to stream

Identify landowners along the stream banks. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item RR-8.2: Implement measures to eradicate or manage invasive species, notably Japanese knotweed

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of invasives along the stream banks.

Action Item RR-8.3: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and re-direct water flow through the section.

Action Item RR-8.4: Awareness of bridge/culvert maintenance schedules

Coordinate with the township and PennDOT District 11-0 to determine if any of the structures are on the maintenance plan. Encourage early discussions to make officials aware of issues surrounding the structures so design plans incorporate findings of this and subsequent reports/monitoring events.

Action Item RR-8.5: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging storm water directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Robinson Run



POOR

Stream Reach 9

Reach RR-9 is received an overall POOR rating. The surrounding land use has some residential, but it is primarily forested. In this section, the stream is once again adjacent to the Panhandle Trail. Bank erosion, barriers to fish passage and sedimentation appear to be the causes of the low rating. Japanese Knotweed is present on both stream banks along this reach.



Major obstruction (RR-9 Photo 3)



Quad damage (RR-9 Photo 6)

Action Items

Action Item RR-9.1: Implement measures to eradicate or manage invasive species, notably Japanese knotweed

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of invasives along the stream banks.

Action Item RR-9.2: Streambank stabilization

Evaluate streambank stabilization methods, including gabion walls, live cribbing, dump rock, and vegetative plantings. In addition, evaluate the possibility of installing in-stream structures upstream to slow and redirect water flow through the section.

Action Item RR-9.3: Investigate removal of barriers to fish passage

Although likely impeding the passage of fish upstream, these barriers are likely acting as in-stream structures reducing the velocity of the flow through this reach. Investigate the possibility of removing or adjusting the structure to act more like a cross vane or j-hook.

Robinson Run



POOR

Stream Reach 10

Reach RR-10 is furthest reach upstream evaluated by the volunteers. This short section received a POOR rating. This section maintains a residential/commercial area along the left downstream bank and a forested area along the right downstream bank. Poor riparian coverage in the residential/commercial area was noted. Within this reach, many pipe outfalls are present, ranging from metal to PVC materials. AMD was noted in this section.



AMD flow (RR-10 Photo 4)



Drainage (RR-10 Photo 6)

Action Items

Action Item RR-10.1: Improve riparian area to retain excess nutrients from the residential, commercial, and light industrial areas adjacent to stream

Identify landowners along the stream banks. Discuss riparian restoration techniques, including laying back the banks to a minimum 2:1 slope, planting with native shade trees, and allowing for a “no-mow” zone to encourage growth in these areas to retain nutrients and sediments.

Action Item RR-10.2: Investigate source of AMD

Identify the sources of AMD that are identified within this stream reach and any mitigation measures being implemented to address the situation. The sources of AMD that are not being addressed should be prioritized and efforts undertaken to improve the present situation.

Action Item RR-10.3: Implement measures to eradicate or manage invasive species, notably Japanese knotweed.

Coordinate with Penn State Cooperative Extension or the local DCNR forester for methods to manage the infestation of Japanese Knotweed along the streambanks.

Action Item RR-10.4: Investigate pipe outfalls

Coordinate with South Fayette Township to identify CSO outfall locations for inclusion in the Act 537 planning. Avoid directly discharging storm water directly into streams. Evaluate methods that filter storm water into the ground, including porous pavement, gravel wetlands, or tree box filters.

Robinson Run



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Fish Habitat Structures

The South Fayette Conservation Group in conjunction with SF Township Public Works, the Western Pennsylvania Conservancy and community volunteers installed eight structures in the clean waters of Miller's Run upstream of the Gladden Discharge with \$10,000 in funding from the Allegheny County Conservation District's Clean Water Fund.

In addition to creating fish habitats, the structures also provide great stream bank erosion relief. The project detailed in an article which appeared in the Pittsburgh Post Gazette.



Logs are precisely placed to direct the flow away from the stream bank. Root wads are also sometimes used to create deflectors. 18 Hemlock trees and 5 root wads were used in the



18 Hemlock trees and 5 root wads were used in the completion of 8 structures for this project. Rebar and stone secure the logs in place.



Approximately 120 tons of rock were used over the 3 days that it took to construct the deflectors.



Land disturbed by the construction is properly restored and seeded.



Miller's Run Project

Western Biological Conservancy

- Structure (represented by a brown bar)
- Flow (represented by a blue arrow)
- Access Lane (represented by a yellow line)

0 20 40 80 120 160 Feet



South F

2009 FISHING RUN STREAM SEALING & 2011 FISHING RUN STREAM SEALING CONSTRUCTION COST FUNDING ADDITION

In 2010, the South Fayette Conservation Group (SFCG) was awarded a Growing Greener Plus Grant for \$487,853. In 2012, SFCG was awarded an additional Growing Greener Plus Grant for \$259,495. In 2012, NRG Energy, Inc. provided \$5,000 additional funding to SFCG for the project.

PROJECT PARTNERS&CONTRACTORS

- PA DEP, Bureau of Abandoned Mine Reclamation
- Cuddy Partners LP; Mr. & Mrs. Robert Saussol; & Senules Property Owners
- South Fayette Conservation Group
- Tetra Tech NUS, Inc. Pittsburgh, PA (Design & Permitting)
- John Kosky Contracting, Inc., Cuddy, PA (Construction)
- Hedin Environmental, Pittsburgh, PA (Water Monitoring)

The SFCG is working to restore Chartiers Creek. Remediating the Gladden Mine Discharge would restore the four downstream miles of Millers Run and several miles of Chartiers Creek below the junction of Millers Run and Chartiers Creek. Previous grant funds have been expended in this watershed on projects that aimed to reduce the impact that the Gladden Discharge has on Chartiers Creek. These projects include:

1. A Restoration Plan for Large Mine Discharges to Lower Chartiers Creek
2. The Fishing Run Restoration and Maude Mine Reclamation Project
3. The Gladden Discharge Passive Treatment project.

Based on stream flow monitoring data, it was determined that stream flow from Fishing Run and an Unnamed Tributary of Millers Run was lost as a result of infiltration into the abandoned mine workings. Most of these stream channels are often dry due to the losses and as a result, they are barren of aquatic life. It is estimated that 500 gpm of surface water is being lost along stream segment #4 and another estimated 200 gpm of surface water is being lost upstream along stream segment #2.

The Fishing Run Stream Sealing project aims to eliminate infiltration of surface water into the mine by installing Fabriform Unimat stream liner or by grouting the strata beneath the stream bottom using a single component polyurethane grout injection. By preventing infiltration at the source, flow at the Gladden Discharge will be reduced by an estimated 25percent. This flow abatement will result in the prevention of an estimated 230 pounds of iron pollution per day from entering into Millers Run and Chartiers Creek. Mitigating these flow losses would also restore perennial flow to 2.1 miles of stream channel on Fishing Run and the unnamed tributary to Millers Run.

Reducing these stream losses would not only restore flow to the streams but also reduce the pollution to Millers Run and Chartiers Creek and may have an added benefit of reducing the passive treatment size to a point where the system would sufficiently restore Millers Run.

2007 – 2009 Gladden Discharge Passive Treatment Project

Sponsored by the South Fayette Conservation Group through a \$157,020.00 grant awarded in 2007 by the PADEP Growing Greener.

PROJECT PARTNERS

- PADEP BAMR
- Tetra Tech Nus, Inc.,
- HedinEnvironmental,
- John Kosky Contracting, Inc.
- South Fayette Conservation Group

Summary

The South Fayette Conservation Group and project partners completed a design option for the Gladden Discharge Passive Treatment System. The proposed treatment system, as currently designed, would remove approximately 90% of the iron loading from Millers Run under average flow conditions. The project includes an anoxic limestone drain, two settlement ponds, a sludge drying pond and enhanced aeration. The estimated cost of the treatment system was \$3,630,000.

The average flow rate of the Gladden Discharge was 935 gpm. The average iron concentration was 100.6 mg/l. Millers Run above the discharge is in compliance with in stream water quality criteria. Millers Run below the discharge averaged 14.2 mg/L Fe, which is 12.7 mg/L higher than the instream standard of 1.5 mg/L Fe. The investigation also identified four locations where nearby streams were losing most or all of their flow through subsidence sink holes and subsurface cracks into the mine. Three of the sites are located on Fishing Run, a tributary to Millers Run, and one site is on an unnamed tributary to Millers Run.

Further surface stream loss remediation work within the mine pool area was proposed by the South Fayette Conservation Group prior to application for construction funding of the treatment system. This additional work could result in an added benefit of reducing the treatment size to a point where the system would sufficiently restore Millers Run, a major goal of the SFCG and the PA DEP.

The Fishing Run Restoration and Maude Mine Reclamation Project 2005 to 2008

PROJECT PARTNERS

- PA DEP, Bureau of Abandoned Mine Reclamation
- South Fayette Conservation Group (SFCG)
- Chartiers Nature Conservancy (CNC)

CONTRACTORS

- GAI Consultants, Inc., Pittsburgh, PA (Design)
- Hedin Environmental, Pittsburgh, PA (Geotech)
- Kosky Construction, Cuddy, PA (Construction)

CONSTRUCTION SUMMARY

- Project Start Date: Nov. 17, 2005 (Grant awarded to South Fayette Conservation Group)
- Construction Start Date: Mar. 1, 2007
- Completion Date: May 2008
- Construction Costs:
 - Title IV AML Funds - \$327,628 (Growing Greener Grant through the PADEP-BAMR).
 - Allegheny County Conservation District Funds - \$5,000 District for riparian tree plantings along the re-built Fishing Run stream channel.

The project reclaimed seven OSM priority 2 AML features including:

- An open portal
- A partially sealed mine opening
- Approximately 1,500 linear feet of dangerous highwall
- Four dilapidated coal preparation plant and coal load-out structures

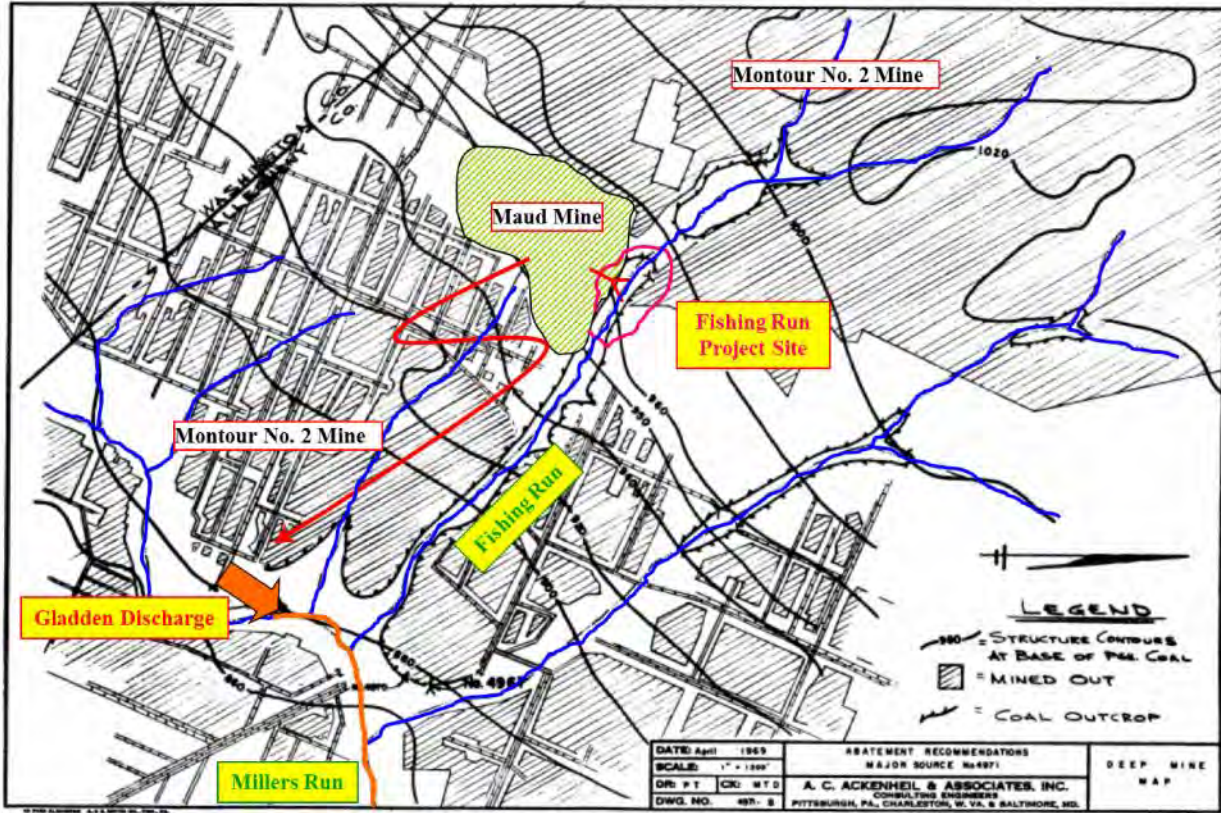
The open mine portal captured the flow from the upper portion of Fishing Run (a drainage area of 950 acres), a tributary to Millers Run. Stream flows exceeded 2,500 gpm during the spring of the year. The stream entered the Pittsburgh Coal Co., Montour No. 2 abandoned underground mine via the Maud Mine and emerged downstream as part of a large AMD discharge to Millers Run (the Gladden Discharge).

Benefits, in addition to the elimination of the hazardous AML features include:

- 1,100 linear feet of Fishing Run restored
- The clean water inflow to the abandoned mine complex was eliminated
- The Gladden Discharge flow rate and iron load were reduced
- Approximate decrease in flows from approximately 1,320 gpm to 935 gpm, average.

Canonsburg USGS Topographic Map





Confluence of Millers Run and Chartiers Creek