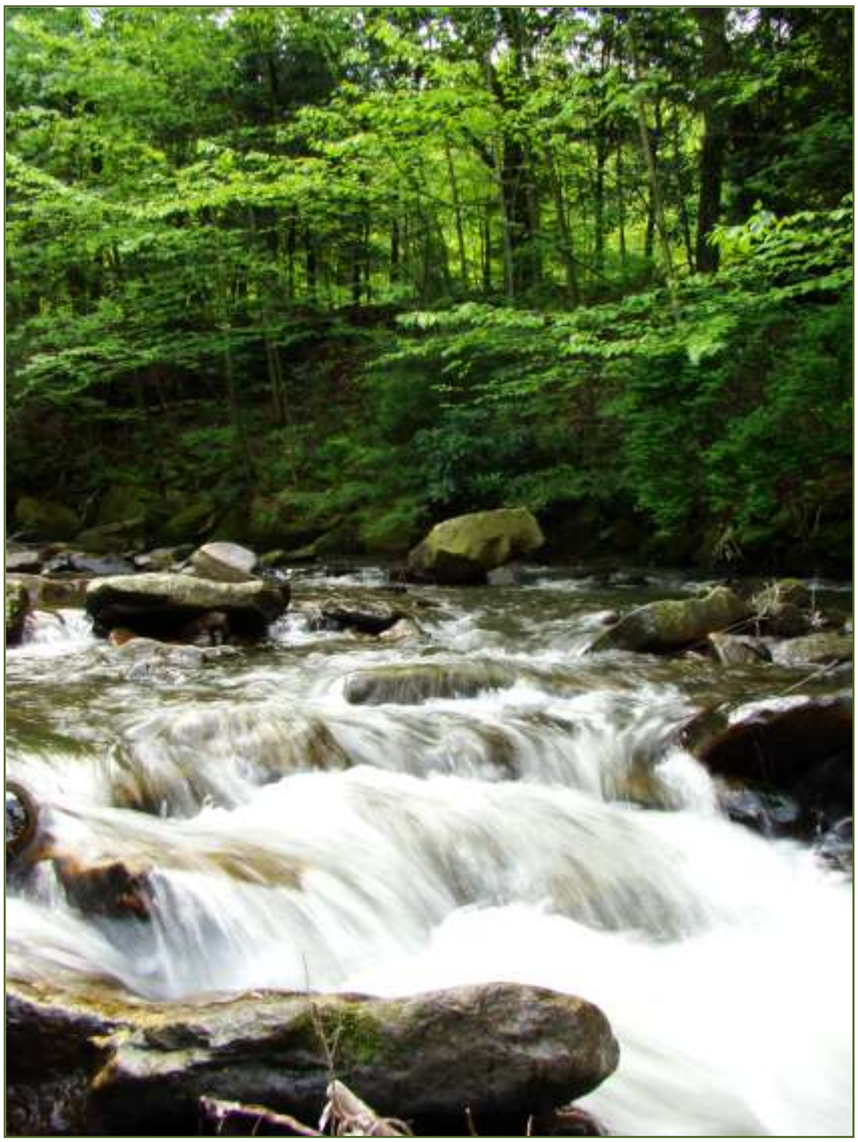
Little Paint Creek

Coldwater Conservation Plan



Paint Creek Regional Watershed Association

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Paint Creek Regional Watershed Association

Cover photo by Melissa Reckner

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Executive Summary

In 2010, the Coldwater Heritage Partnership, which supports the evaluation, conservation and protection of Pennsylvania's coldwater streams, awarded the Paint Creek Regional Watershed Association (PCRWA) a Coldwater Conservation Grant for Little Paint Creek in Cambria County. PCRWA utilized this grant to contract the Conemaugh Valley Conservancy and its Kiski-Conemaugh Stream Team to collect and review previous studies and data, acquire new data, and develop a strategy to protect and conserve Little Paint Creek, the only stream in the Paint Creek Watershed that has portions listed as Wild Trout and Approved Trout Waters by the Pennsylvania Fish and Boat Commission (PFBC). Approved Trout Waters are waters containing significant portions that are open to fishing and are stocked with trout.

Little Paint Creek is a second order stream with the best water quality in the 36 square-mile Paint Creek Watershed. Many streams, including the mainstem of Paint Creek, are plagued by Abandoned Mine Drainage. Paint Creek is the second largest contributor of iron and aluminum to the Stonycreek River (Deal et al. 2007).

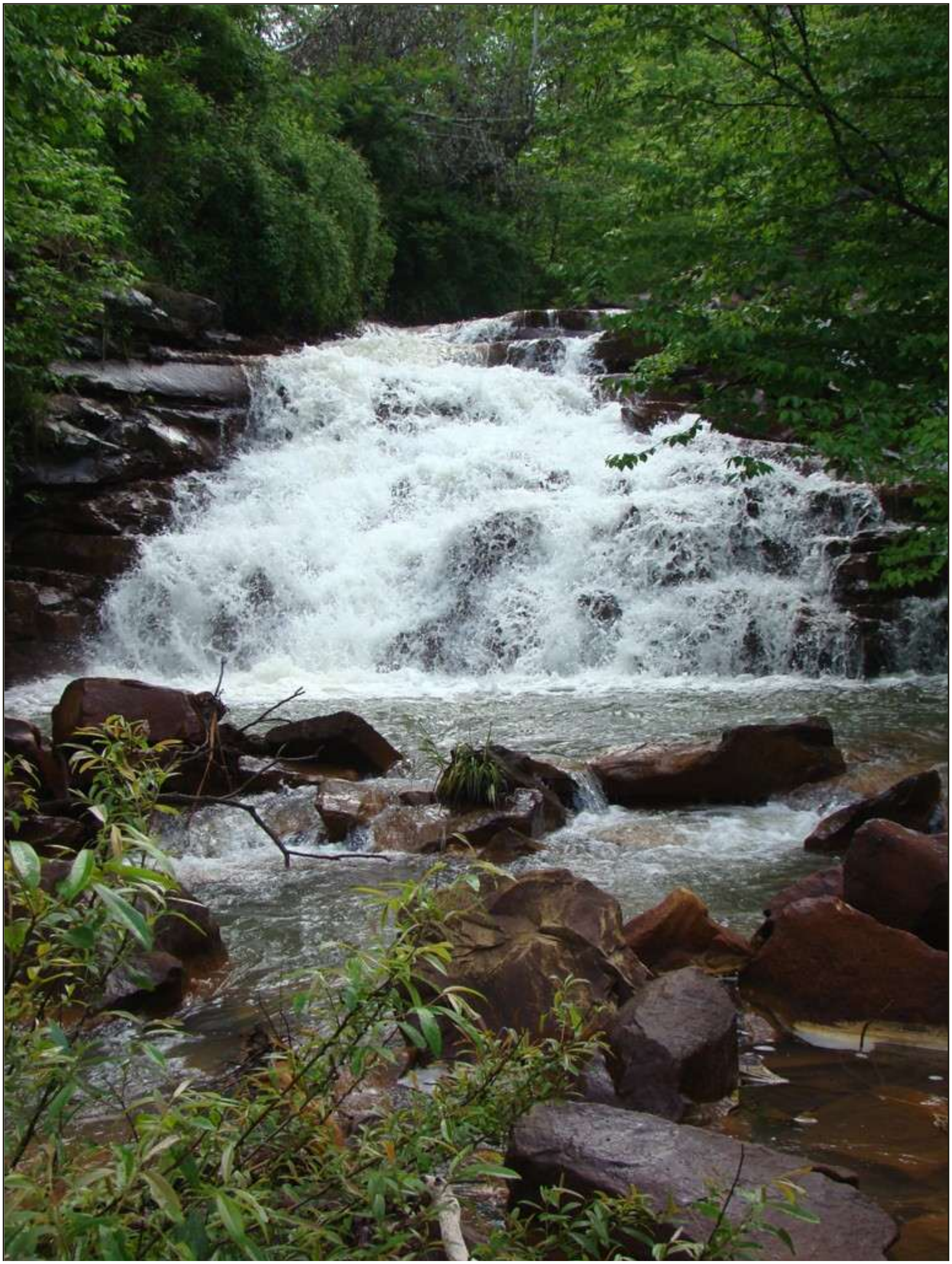
The entire Little Paint Creek watershed is classified as a Coldwater Fishery by the Pennsylvania Department of Environmental Protection. The PFBC lists Little Paint Creek as an Approved Trout Water, with the mainstem of Little Paint Creek from the Elton Sportsmen's Dam downstream to the T305 (Berwick Road) Bridge listed as a Wild Trout Water, which is a stream that supports a natural reproducing population of wild trout.

Data collected during this project documented that UNT45242, an unnamed tributary to Little Paint Creek locally known as Fox's Run, is a Wild Trout Water and could be classified as High Quality stream based on the macroinvertebrate community. Fox's Run was the only stream surveyed in the watershed that had a population of wild brook trout, though a PFBC survey in 1979 found wild brook trout in the mainstem of Little Paint Creek, two miles below the Elton Sportsmen's Dam, and wild brown trout at the same site in 2001.

Interestingly, UNT 45234, locally known as Rocky Run, has the habitat necessary to support trout, but its water chemistry limits fish species to blacknose dace, creek chubs, white suckers, and a few mottled sculpin. This discovery led to more detailed water chemistry studies; however, additional studies are needed and are a recommendation of this plan.

The main stem of Little Paint Creek at the State Road 160 Bridge had the greatest number of macroinvertebrate taxa, i.e. species richness, and the greatest number of total fish. This is the section most visited by anglers, because of regular trout stockings by the PFBC and Windber Sportsmen's Club.

Light industry and urbanization impact the Little Paint Creek watershed and new potential pollution sources like natural gas extraction threaten this watershed. Developers need to consider their impacts, adhere to best management practices, orient new infrastructure along existing corridors, and help preserve the state of Little Paint Creek.



Little Paint Creek Falls
Photo by Melissa Reckner

Introduction

About the Paint Creek Regional Watershed Association

The Paint Creek Regional Watershed Association (PCRWA) was formed in 2000 with the mission to restore, enhance and protect the Paint Creek watershed by engaging the public, fostering partnerships and monitoring water quality. Its goals include:

- Identifying, reclaiming and controlling Abandoned Mine Drainage affected areas within the watershed;
- Promoting wise land use and management of natural resources within the watershed;
- Organizing and participating in stream cleanup efforts to remove litter from waterways and riparian areas;
- Revitalizing and expanding the suitable fishing areas in the watershed by promoting and protecting clean waterways, like Little Paint Creek;
- Maintaining suitable habitats for game animals;
- Creating environmentally friendly hiking and biking trails to help promote tourism within the region; and
- Advocating awareness, appreciation and respect for environmental issues through community education.

A representative from each of the six municipalities within the watershed serves on PCRWA's board of directors, along with one member-at-large. The board meets on the fourth Monday of the month at 6:00 PM at the Good Shepherd Lutheran Church in the village of Rummel.

Conservation Plan Objectives

The objectives of this conservation plan are to identify and inventory the water quality of and potential threats to the Little Paint Creek watershed and recommend enhancement and protection measures to secure this coldwater resource. This plan will be shared with other conservation partners and municipalities as a reference tool to maintain or improve stream quality, aquatic habitat, and recreation in the watershed.

The compilation of this plan includes recent and historical fish surveys completed by the PFBC, water chemistry acquired through data loggers and volunteer and professional grab sampling, macroinvertebrate community structure, and historical information.

Watershed Location

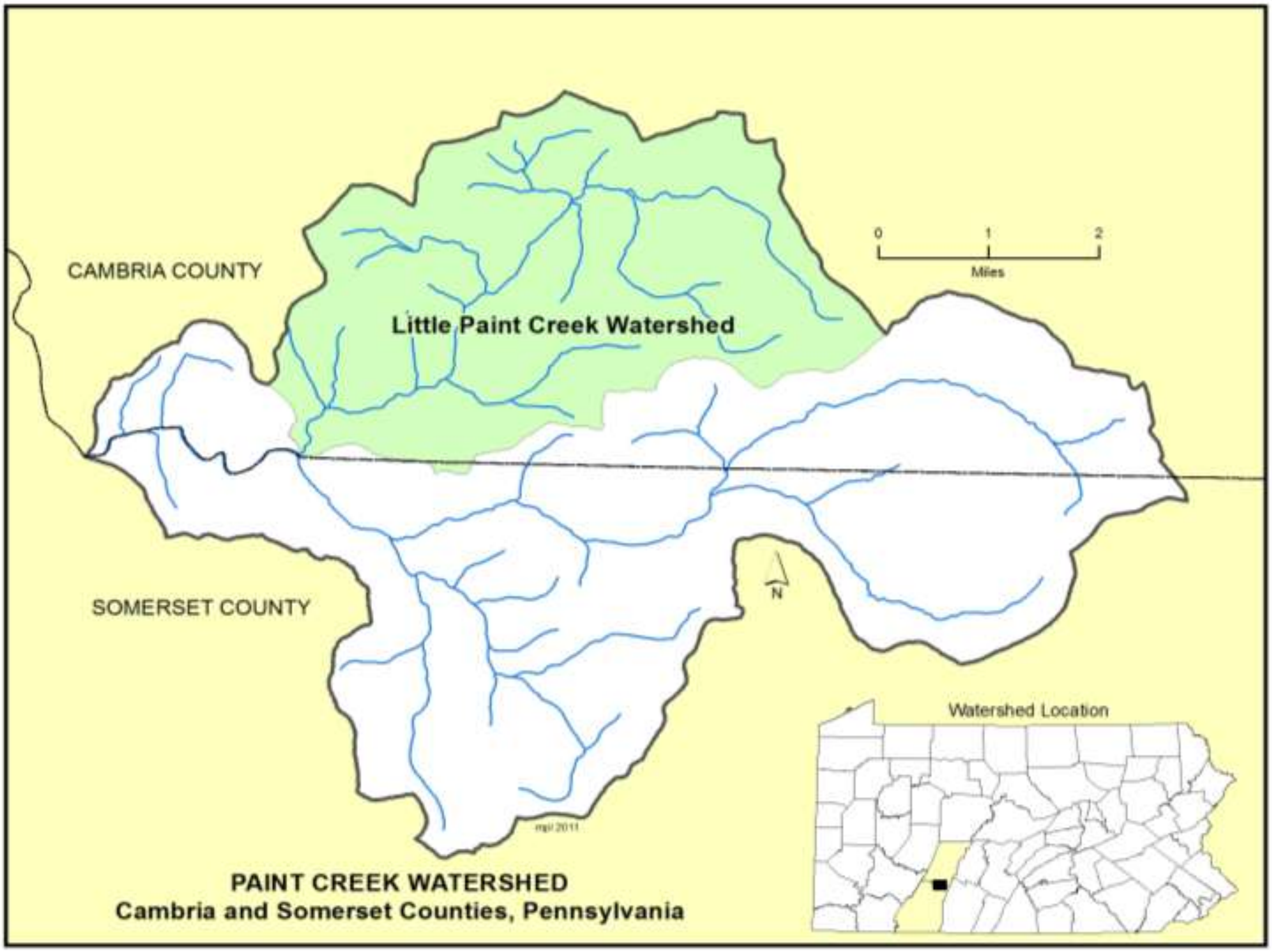


Figure 1 – Outline of the Paint Creek and Little Paint Creek watersheds

Little Paint Creek originates near the town of Salix and flows southwest until its confluence with Paint Creek. It is a second order tributary to Paint Creek, a third order stream. Paint Creek is the fourth largest tributary to the Stonycreek River (Deal et al. 2007). The Paint Creek watershed is 36 square miles and lies on the boundary of Cambria and Somerset Counties (Figure 1).

The Little Paint Creek watershed encompasses 13 square-miles on the Allegheny Mountain Section of Pennsylvania's Appalachian Plateau and is located primarily in southern Cambria County. Only a very small portion lies in northern Somerset County. Adams and Richland Townships are the principal municipalities, although Scalp Level Borough does encompass the mouth of Little Paint Creek (Figure 2). The following suburbs of the City of Johnstown are the largest towns near the watershed: Windber, Salix, Elton and Scalp Level.

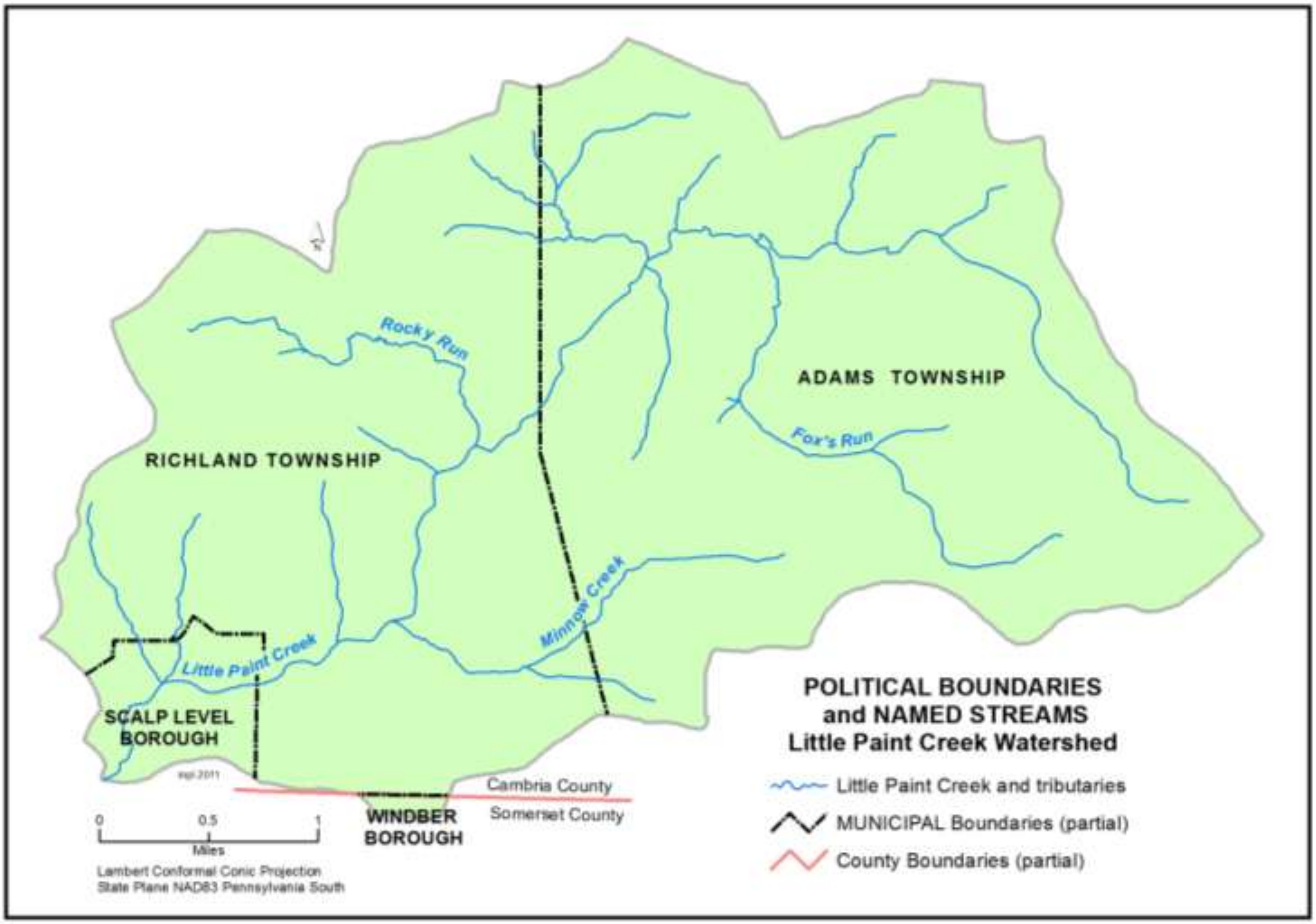


Figure 2 – Political boundaries within Little Paint Creek watershed and named streams

Watershed Characteristics

Unlike the majority of streams within the Paint Creek watershed, most of Little Paint Creek is not degraded by Abandoned Mine Drainage, coal mining, or coal refuse piles. While deep mining did happen in the watershed (Figure 3), the geology of the area caused deep mine discharges to flow into the South Fork of the Little Conemaugh River watershed to the northeast.

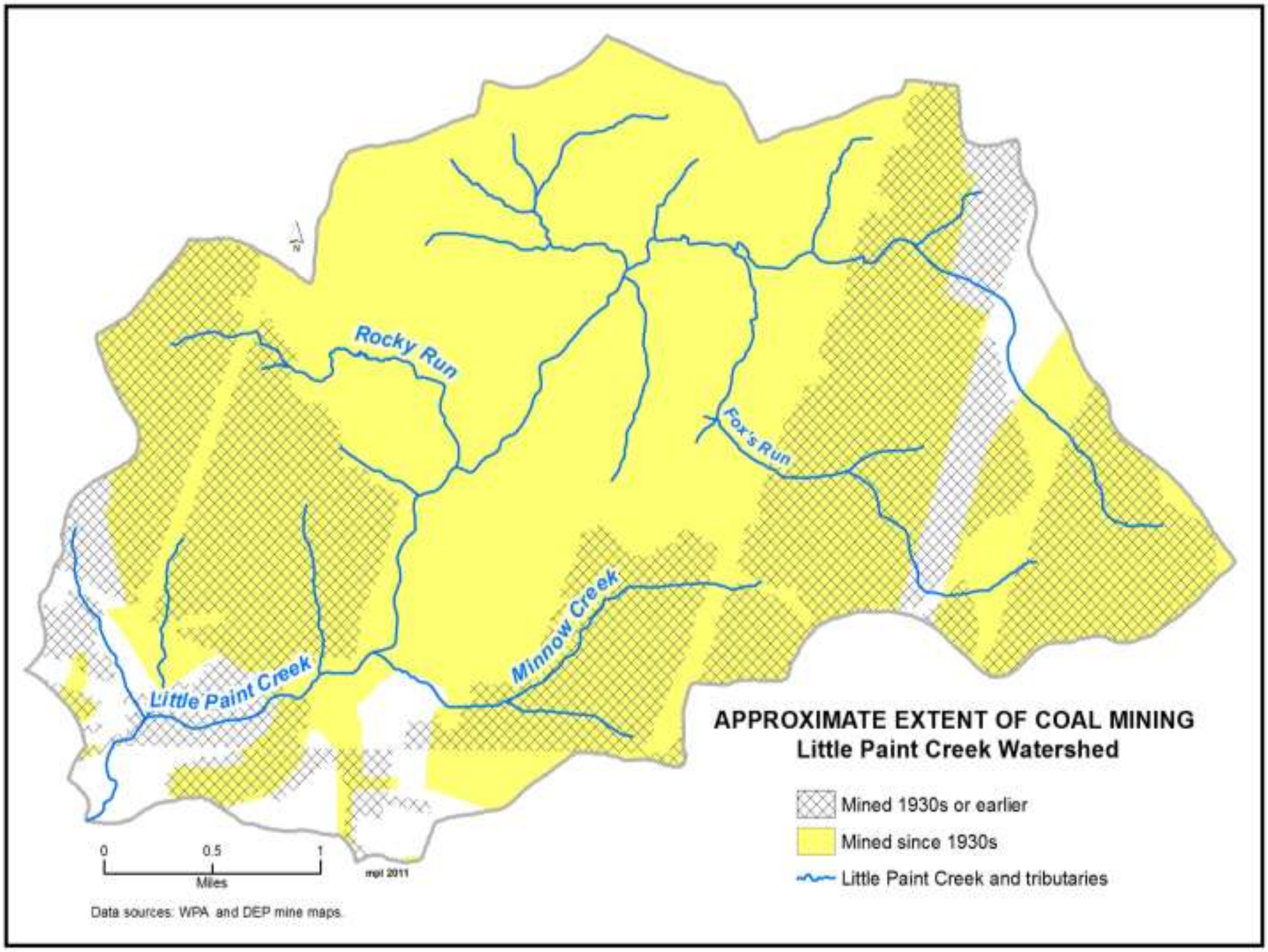


Figure 3 – Extent of historical coal mining within the Little Paint Creek watershed

Urbanization, erosion, and sedimentation are the primary impacts to the Little Paint Creek watershed. Not only are the headwaters degraded by erosion and sediment from past timbering, but an unnamed tributary to Little Paint Creek – UNT 45234 – locally known as Rocky Run is impaired by industrial pollutants. Rocky Run drains a heavily urbanized section of Richland Township, a very populated suburb of the City of Johnstown.

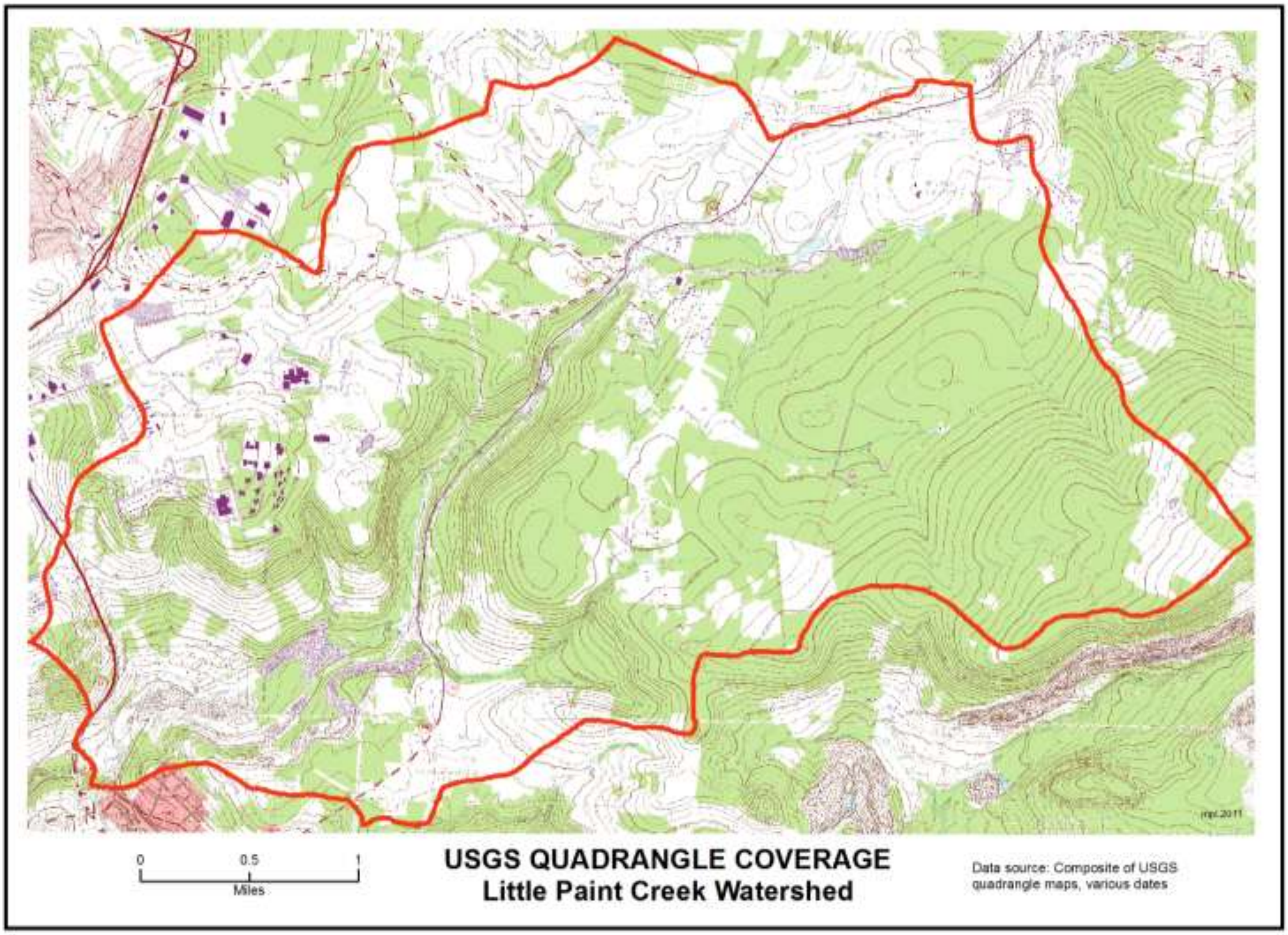


Figure 4 – Topographic coverage of the Little Paint Creek watershed

Despite these pollution sources, Little Paint Creek is listed as a Coldwater Fishery under Title 25 Chapter 93 of The Pennsylvania Code. Additionally, a 3.2 mile section of Little Paint Creek from the Elton Sportsmen's Dam to the Township Road 305 (Berwick Road) Bridge is the only section out of the 61.3 stream miles in the Paint Creek Watershed listed as an Approved Trout Water by the Pennsylvania Fish and Boat Commission (PFBC) (Clark 2005). The PFBC and the Windber Sportsmen's Club stock this section. Elton Sportsmen's Dam is also stocked with trout by the PFBC. Please read the Fish section on page 39 for more information Little Paint Creek as a fishery.

Land use

PAMAP Program Land Cover Data for Pennsylvania used to create Figure 5 indicated that over 60% of the watershed is forested. Fields and pasture are the next prevailing land use with roughly 16% of the watershed slated for this purpose. Only about 3% is farmed for crops. Approximately 8% is residential, while nearly 5% is industrialized. The Windber Country Club golf course covers a small portion of the watershed (Figure 5).

Unfortunately, there are no public lands within the watershed; however, private landowners that own large tracts, like Berwind Natural Resources Corporation, allow hunting and hiking on their property.

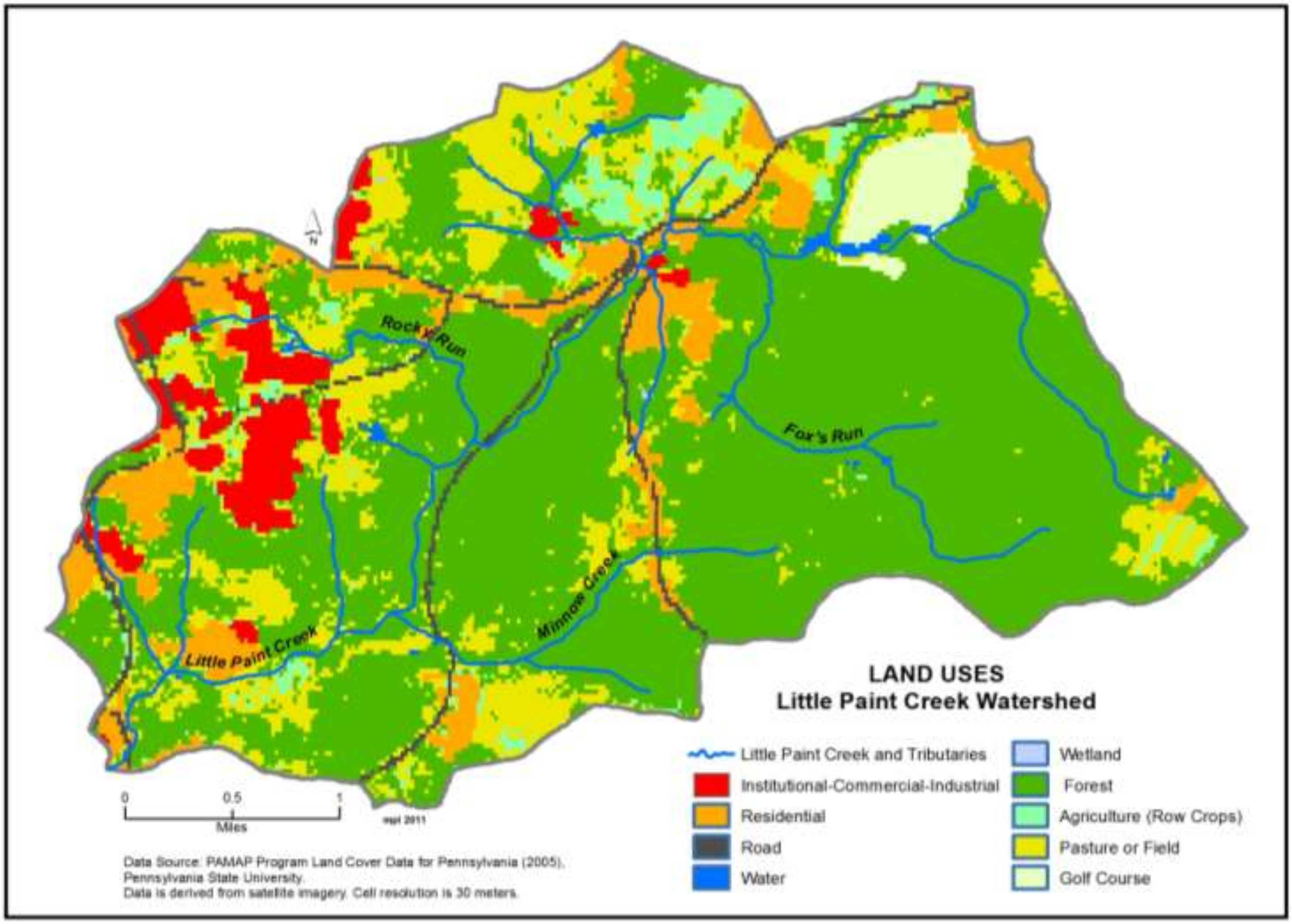


Figure 5 – Land uses within the Little Paint Creek watershed

Based on GIS files, there are approximately 55 miles of paved highways, including about 41 miles of locally maintained and 14 miles of state maintained roads (Figure 6). These figures do not include private roads, like driveways, nor do they include dirt and gravel roads.

According to 2009 Traffic Volume figures obtained from the Pennsylvania Department of Transportation, the Annual Average Daily Traffic on state roads in the Little Paint Creek watershed is 30,800 vehicles. State Route 56 is the most heavily traveled with 17,000 vehicles. Between 3,100 and 4,700 vehicles travel the portions of State Route 160 in the watershed, while 4,300 vehicles are on State Route 756, 1,900 are on SR 3015 in Scalp Level Borough, and 1,800 are on SR 2001 (Centennial Drive) (PennDOT 2009).

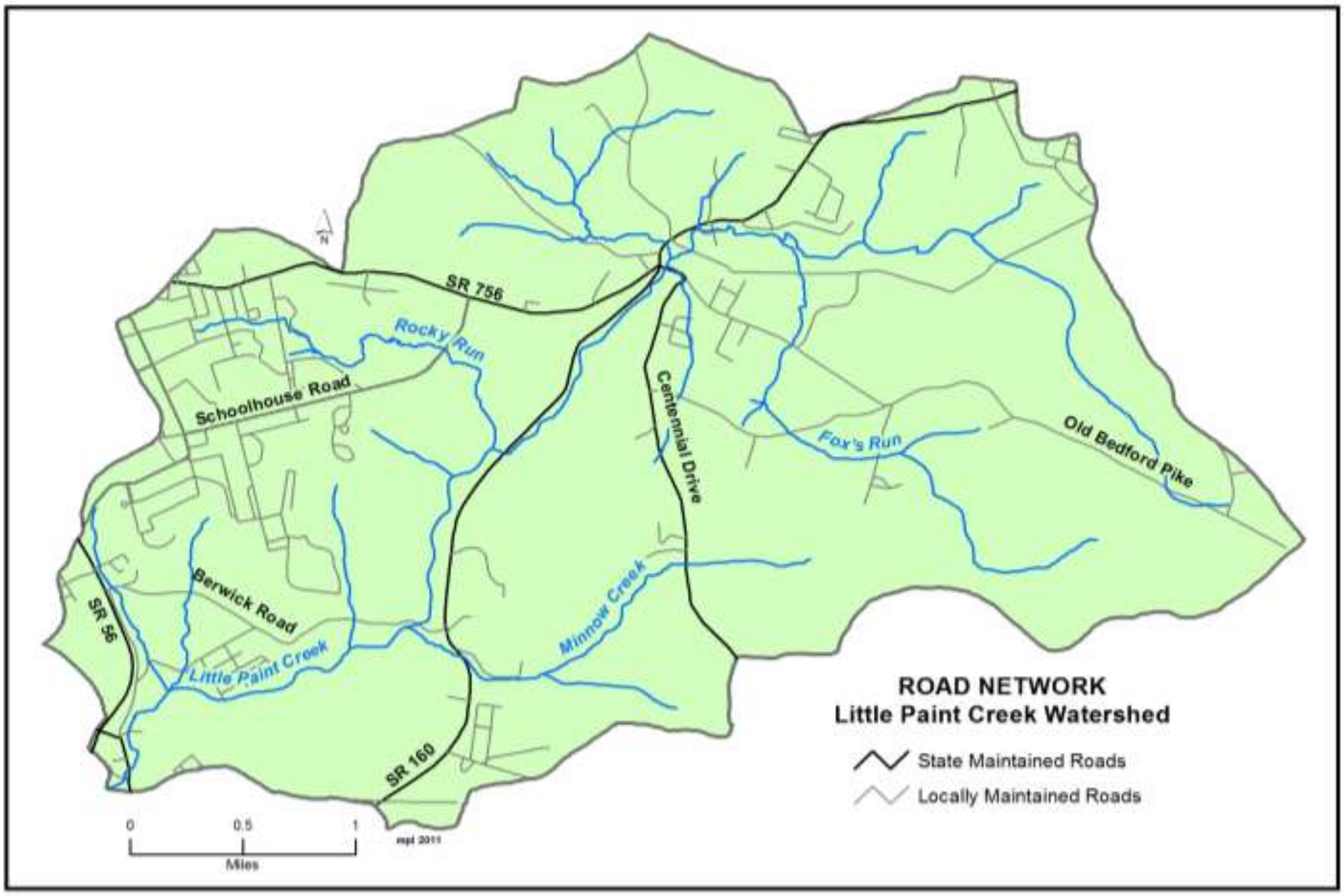


Figure 6 – State and local roads in the Little Paint Creek watershed

Dirt and gravel roads can lead to erosion, increasing sediment in Little Paint Creek and its tributaries. One or more very rural roads have brief stretches where the surface is unpaved, including approximately one mile of Old Bedford Pike.

General History

Little Paint Creek flows into the town of Windber. In 1897, Charles Berwind and his brother Edward, developed the concept of a model-mining town, complete with a network of roads, patch towns, and a company store. They named it Windber by switching the syllables of their last name. While the bulk of the Little Paint Creek watershed lies within Cambria County, Little Paint Creek is associated most closely with the town of Windber, which is in Somerset County.

Thousands of immigrants who left Europe for the United States of America were lured to Windber because of the high number of available jobs due to the flourishing coal industry. “Magyars (Hungarians), Slovaks, Poles, Carpatho-Russians, Italians and other nationalities joined the work-force of the Berwind-White Coal Mining Company in Windber,” (Windber Coal Heritage Center 2011). These immigrants settled in company housing near the mine in which they worked, creating what were known as “patch towns.” There were 13 Berwind-White mines in the Windber area, as shown in Figure 7. The Eureka Mine number 40 is located along Little Paint Creek in Scalp Level Borough.

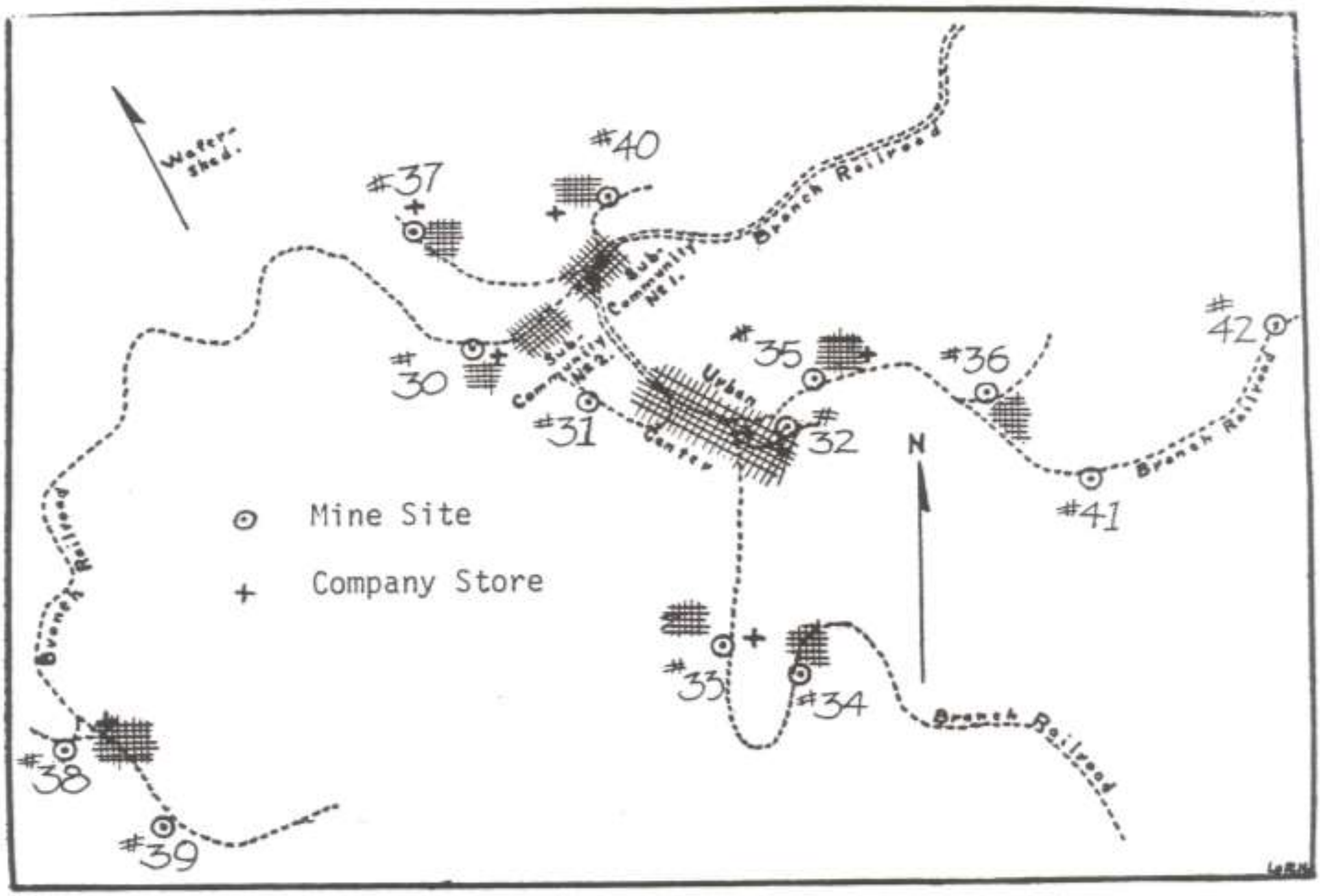


Figure 7. A sketch of the 13 mines and “patch towns” in the Windber area
Source: Dr. Mary Lavine.

Mine 40 was the largest patch town and its mine generated the most coal of all the mines yielding 42 million tons of coal between its most robust years of operation, 1902-1962 (Barkley 2011). It was established in 1902 and cut coal from the Lower Kittanning or "B" seam of coal and later from the deeper "C prime" seam. Drift mines, where the opening to the mine is in a hillside, slightly below the seam of interest, dotted the landscape. The geology of the area allowed the mines to be drained naturally, which facilitated production (Frens 1992).

The Berwind-White Coal Mining Company was so successful largely because of its innovation and high standards for coal. It purchased the best machinery for extraction and continually upgraded it with new technologies; it demonstrated that bituminous coal was the best fuel for steamship operations; and it established contracts with rail lines to deliver coal to New York City (Frens 1992).

The village of Mine 40 remains intact. An observation deck and interpretive panels, maintained by the Eureka Coal Heritage Foundation, overlooks the community (Figure 8). A physical assessment and feasibility study of the Eureka Mine 40 site prepared for the Johnstown Area Heritage Association in cooperation with the Pennsylvania Historical and Museum Commission in June 1992 by Frens and Frens Restoration Architects documents man-made and environmental features and recommends stabilization and preservation action.

Figure 8. Mine 40 overlook
Photo by Melissa Reckner

Prior to the development of Windber, the area was a beautiful, natural landscape that caught the attention of George Hetzel (1826-1906) and his colleagues who became known as the "Scalp Level Artists." These artists regularly traveled from Pittsburgh to the Scalp Level area by train, then horse and buggy, to view the scenic beauty that inspired the formation of the Scalp Level School. The course of waterways, including Little Paint Creek, was transferred to sketch pads and canvas in the mid-late nineteenth century. The Westmoreland Museum of American Art in Greensburg, Pennsylvania, houses several paintings by Scalp Level School artists, including Hetzel and William Coventry Wall.

Figure 9. George Hetzel's Trout Stream in the Alleghenies ~ Source: AllPaintings.org

Figure 10. George Hetzel's Winter Morning
Source: AllPaintings.org

Demographics

Most of the Little Paint Creek watershed lies within Adams and Richland Townships, while a small portion is in Scalp Level Borough. Table 1 lists details about Adams and Richland Townships from the 2000 Census compared to Pennsylvania. The Median Household Income for Adams and Richland Townships is 10-19% less than the Median Household Income for the Commonwealth. The natural beauty of the region, including the Little Paint Creek fishery, could support the development of eco-tourism in the Laurel Highlands and benefit the local economy.

	Adams Township	**Richland Township**	**Pennsylvania**
Total Population	6,495	12,598	12,281,054
Average Household Size	2.56	2.27	2.48
Average Family Size	2.96	2.84	3.04
% of Housing Occupied by Owner	84.1	75.7	71.3
% of Housing Occupied by Renter	15.9	20.1	28.7
% Population a High School Graduate or Higher	81.0	87.5	81.9
% Population with a Bachelor's Degree or Higher	13.2	20.1	22.4
Population Employed (16 year old and higher)	5,178	10,719	9,696,040
Number Employed Who Commute to Work	2,934	4,913	5,556,311
Mean Travel Time to Work (minutes)	21.8	15.7	25.2
Highest Employment Industry	24.0% in Educational, Health, and Social Services	23.4% in Educational, Health, and Social Services	21.9% in Educational, Health, and Social Services
Second Highest Employment Industry	14.7% in Manufacturing	16.7% in Retail Trade	16% in Manufacturing
Median Household Income	$32,442	$36,280	$40,106

Table 1. Demographics of primary municipalities ~ Source: U.S. Census Bureau

Geological Formations

The surface rock formations in the Little Paint Creek watershed are from the Pennsylvanian Age. As shown in Figure 11, the north and northeast portions of the Little Paint Creek watershed, including the headwaters of Little Paint Creek and Fox's Run, consist primarily of the Casselman Formation. According to the Pennsylvania Bureau of Topographic and Geologic Survey, the Casselman Formation is made up of, "Cyclic sequences of shale, siltstone, sandstone, red beds, thin, impure limestone, and thin, nonpersistent coal; red beds are associated with landslides; base is at top of Ames limestone."

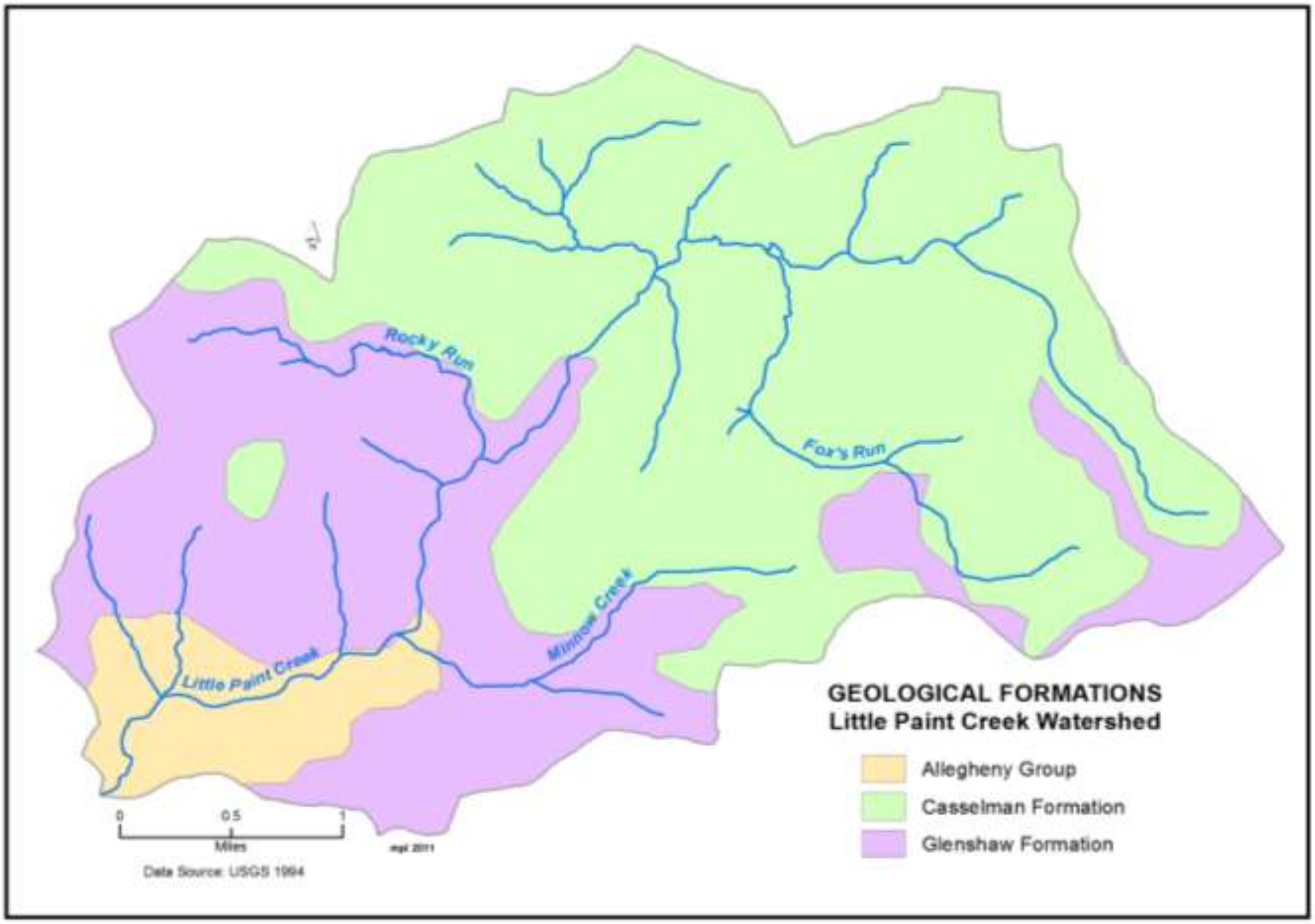


Figure 11. Geological formations in the Little Paint Creek watershed

The middle section of the watershed, including Rocky Run, consists of the Glenshaw Formation, which, again according to the Pennsylvania Bureau of Topographic and Geologic Survey, comprises of, "Cyclic sequences of shale, sandstone, red beds, and thin limestone and coal; includes four marine limestone or shale horizons; red beds are involved in landslides; base is at top of Upper Freeport coal."

The lower section, near the mouth of Little Paint Creek, consists of the Allegheny Group. This is, "Cyclic sequences of sandstone, shale, limestone, clay, and coal; includes valuable clay deposits and Vanport Limestone; commercially valuable Freeport, Kittanning, and Brookville-Clarion coals present; base is at bottom of Brookville-Clarion coal," (Bureau of Topographic and Geologic Survey 2011).

The Berwind-White Coal Company primarily mined the Upper and Lower Freeport and Upper and Lower Kittanning coal seams; hence, only the lower-most portion of Little Paint Creek is polluted by Abandoned Mine Drainage.

Soils

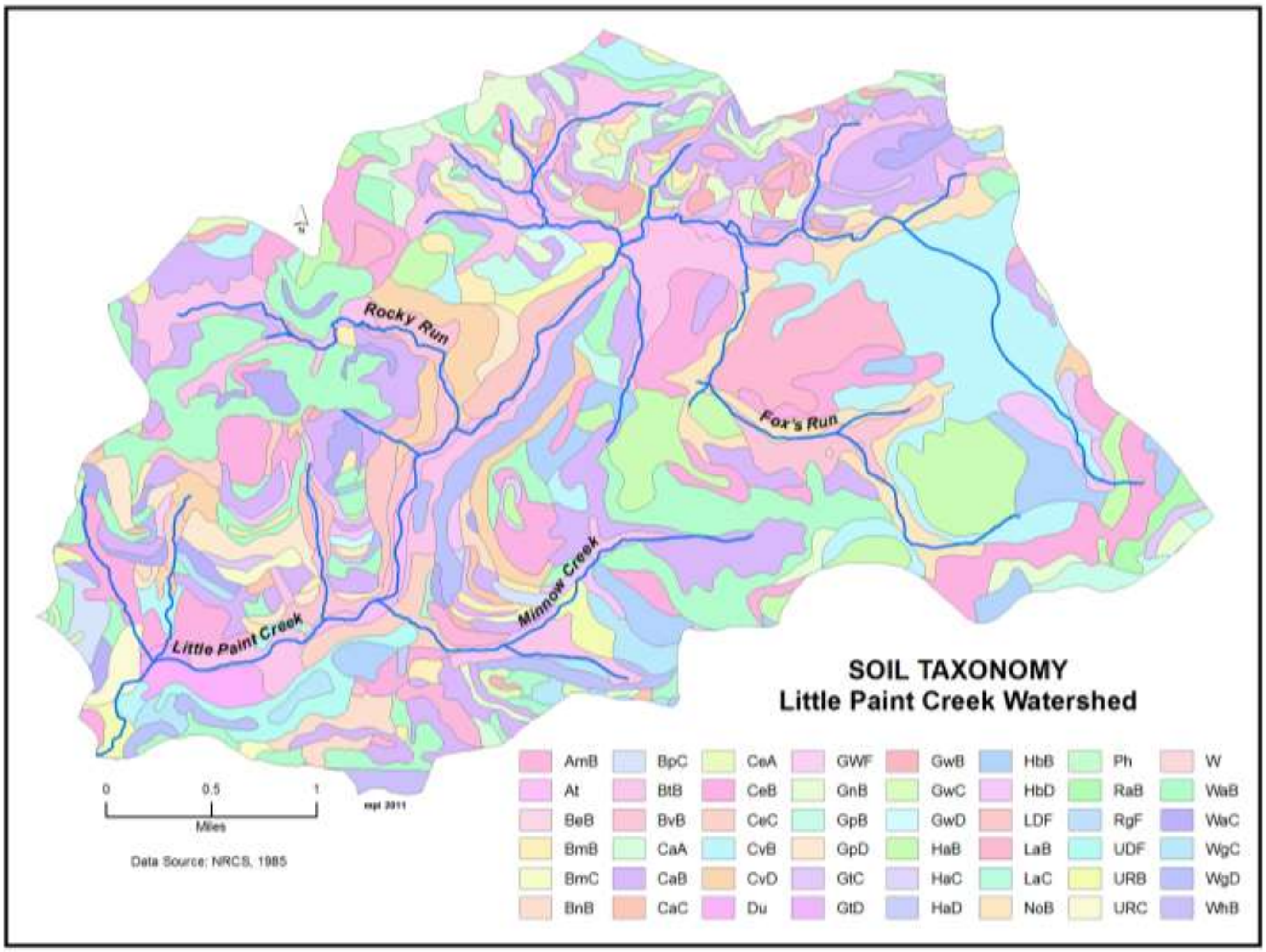


Figure 12. Soils in the Little Paint Creek watershed

The predominant soil types in the Little Paint Creek watershed are from the Cookport-Hazelton-Laidig association, which, according to the *Soil Survey of Cambria County Pennsylvania*, "consists of soils on broad mountains and broad to narrow ridges that have colluvial [loose rock and soil] side slopes dissected by drainage ways," (Farley 1985).

The Cookport soils are found in upland areas and are deep, moderately well-drained soils with moderately slow to slow permeability. Water availability is listed as moderate. These soils are formed from weathered sandstone, conglomerate and siltstone.

Hazelton soils are also found in upland areas and are deep, well-drained soils with moderately rapid to rapid permeability and moderate to low water availability. Acid sandstone and conglomerates produced these soils.

Laidig soils are on uplands and are deep, well-drained soils with moderately slow permeability. They are formed from weathered acid sandstone, siltstone, and shale.

Figure 12 displays the soils of the Little Paint Creek watershed. The following are definitions of the most abundant soil types in the watershed.

BtB – Brinkerton silt loam, 0 to 8 percent slopes; slow permeability and moderate water availability. The high water table associated with this soil type makes it less conducive to croplands and pasture, as the wet soil warms slowly in the spring and animals could cause compaction.

CaB – Cavode silt loam, 3 to 8 percent slopes; slow permeability and high water availability. A seasonally high water table and the increase in slope suggest a moderate hazard of erosion.

CeB – Cookport and Ernest soils, 3 to 8 percent slopes; moderately slow to slow permeability and moderate water availability. Grazing causes compaction during wet periods and the increase in slope signify a moderate erosion hazard.

CvD – Cookport and Ernest very stony soils, 8 to 25 percent slopes; moderately slow to slow permeability and moderate water availability. Surface runoff is listed as medium to rapid with this soil type, which has a seasonally high water table.

HaB – Hazelton channery loam, 3 to 8 percent slopes; moderately rapid to rapid permeability and moderate to low water availability. These soils are good for crops and pasture; however, crop rotation and stringent stocking rates are critical for proper management.

HbB – Hazelton very stony loam, 3 to 8 percent slopes; moderately rapid to rapid permeability and moderate to low water availability. These spoils are often too stony for most farming and, therefore, are commonly wooded.

LaB – Laidig loam, 3 to 8 percent slopes; moderately slow permeability and moderate water availability. Surface runoff is listed as medium and there is a moderate hazard of erosion that can be prevented with proper grazing and pasture rotation.

WaB – Wharton silt loam, 3 to 8 percent slopes; moderately slow to slow permeability and moderate to high water availability. If used for cropland, there is a moderate hazard of erosion.

Many of these soils have acidic runoff, particularly in deeper strata, unless they are limed for agriculture.

Shale Gas

Hydraulic fracturing or "fracking" is a process used to extract natural gas from deep geologic formations that have natural gas trapped in tightly compressed rock layers. Vertical and horizontal drilling are used to access the gas. The vertical portion is drilled to the necessary depth and then a curve is made to drill horizontally, up to 8,000 feet, though technology is developing that will allow horizontal wells to go over two miles in length, through the formation of interest. Explosive charges fracture the formation. Then, a slurry of millions of gallons of water, mixed with a prescribed amount of chemicals and sand, are pumped under high pressure into the well to fracture the shale and facilitate the release of gas from the formation. The amount of water typically required for fracking ranges from one million to five million gallons per well. The actual mixture and percentage of chemicals used are listed as proprietary information; however, some of the chemicals used include algaecides, viscosifiers and petroleum compounds, many of which are known carcinogenics. After the fracking process, the used water, "flow back water," must be reused in the next well or treated at an approved facility (PA DEP 2011).

The Little Paint Creek watershed is underlain by the Marcellus and Utica Shale formations. Currently, gas companies are most interested in tapping the Marcellus Shale; however, companies are exploring ways to access the deeper Utica Shale.

Under the Little Paint Creek watershed, the Marcellus Shale is approximately 150-250 feet thick and lies at a depth of 8,000-9,000 feet (Figures 13 & 14). Because the Marcellus Shale is not as deep in other portions of the state, there has been little exploration or drilling in the watershed. Only one well was drilled (Figure 15); however, as of September 2011, it has not been fractured; therefore, it is not producing. Additionally, this area lacks the infrastructure necessary to take the gas to market. The installation of gas pipelines will occur in the future, which will bring concerns of fragmentation, the introduction of invasive species, erosion and sedimentation, and air pollution.

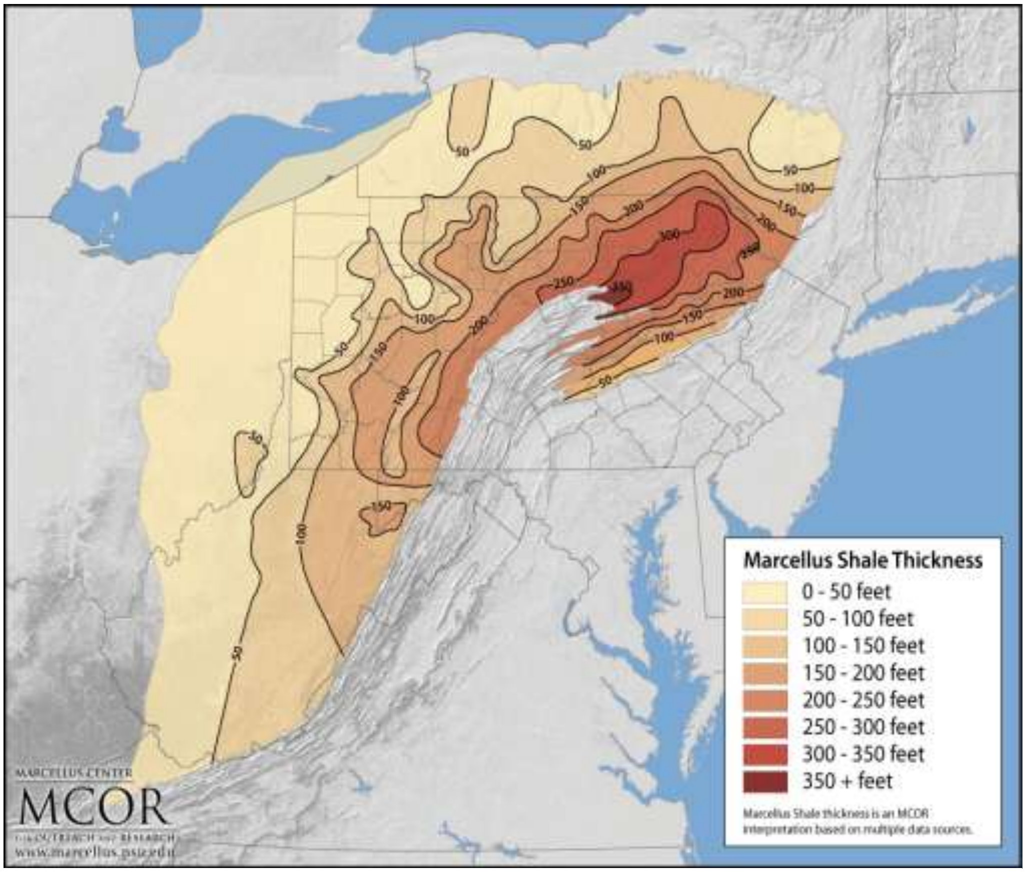


Figure 13. Marcellus Shale Thickness

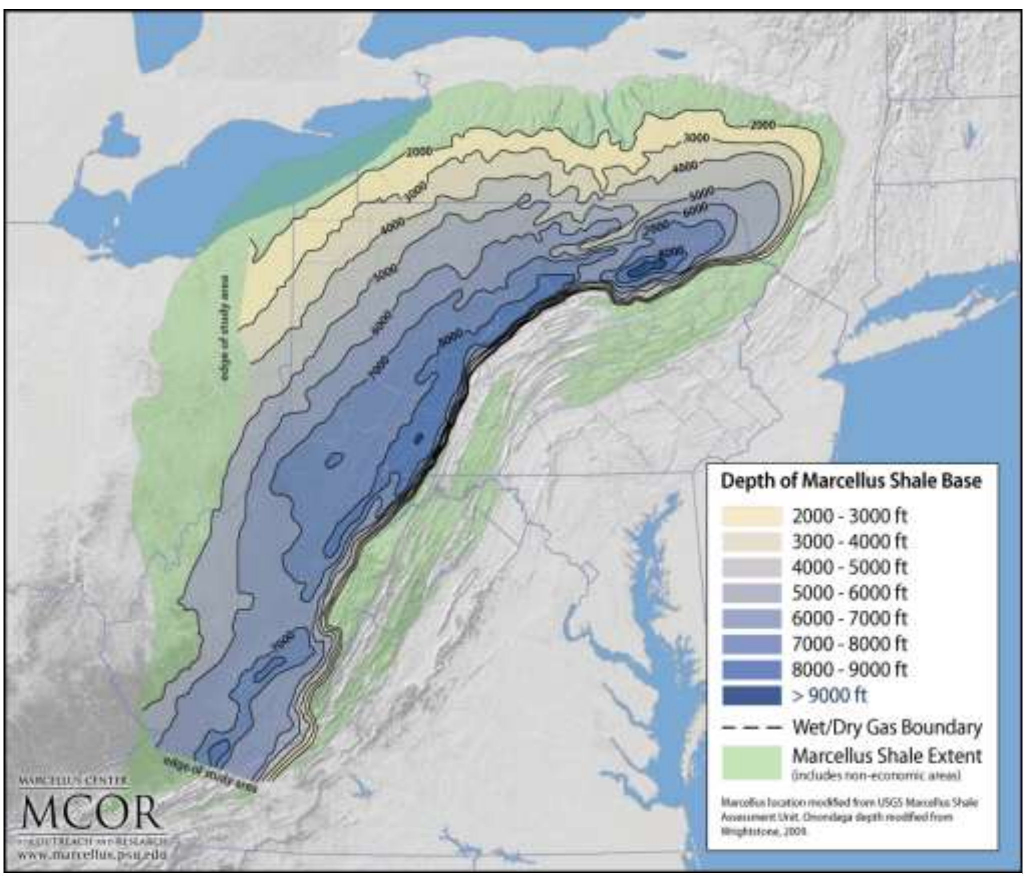


Figure 14. Depth of Marcellus Shale

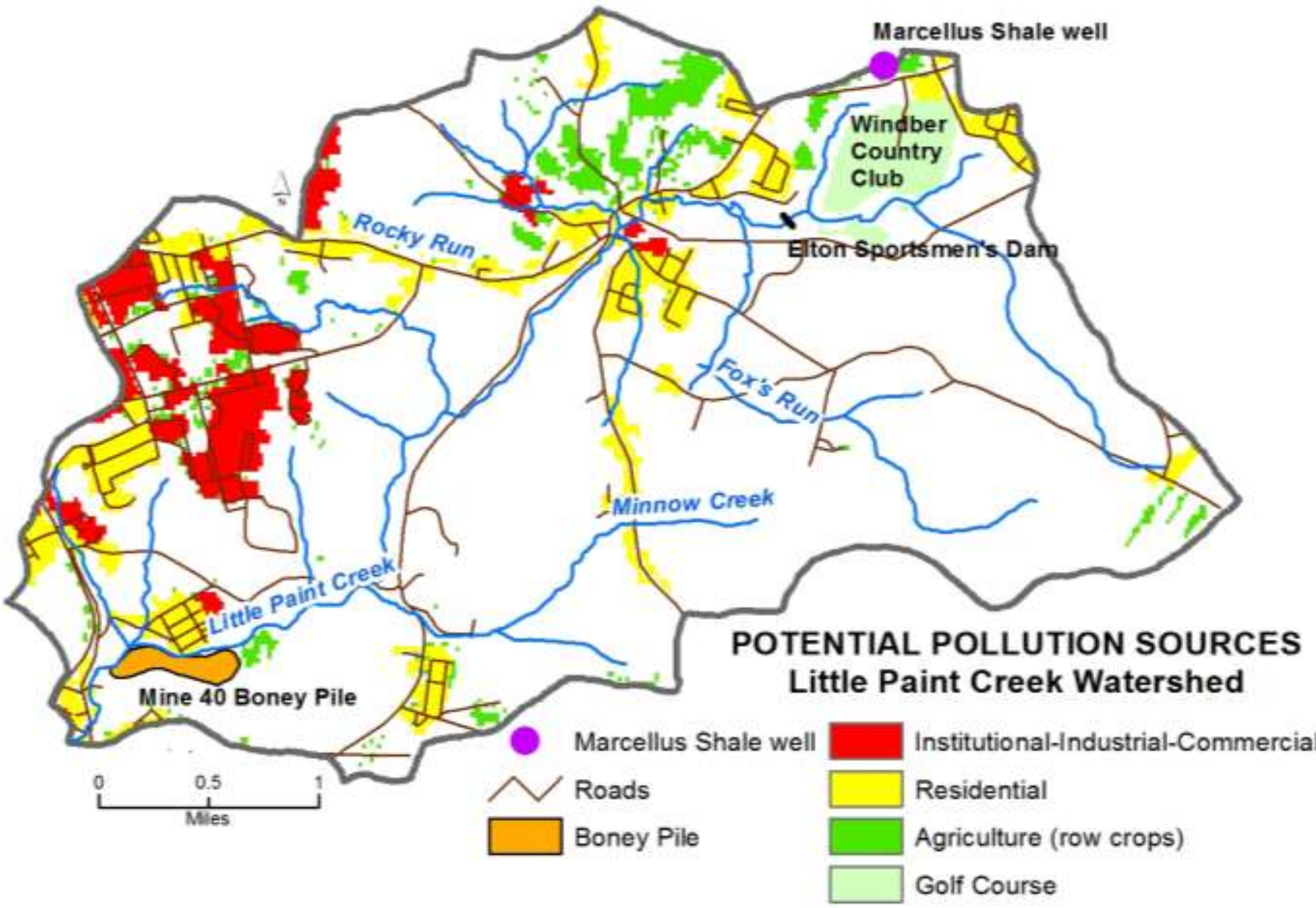


Figure 15. Potential pollution sources in the Little Paint Creek watershed

The Utica Shale also underlies the Little Paint Creek watershed. Here it is approximately 450-500 feet thick and at a depth of 12,000-14,000 feet (Figures 16 & 17).

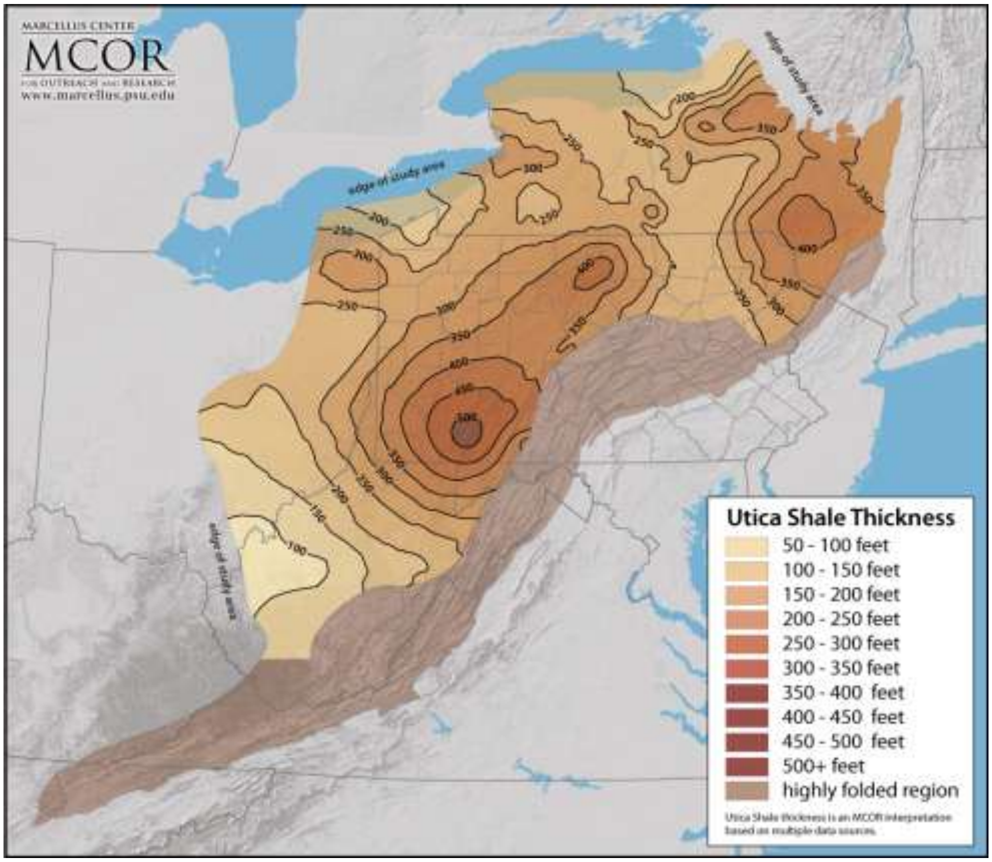


Figure 16. Utica Shale Thickness

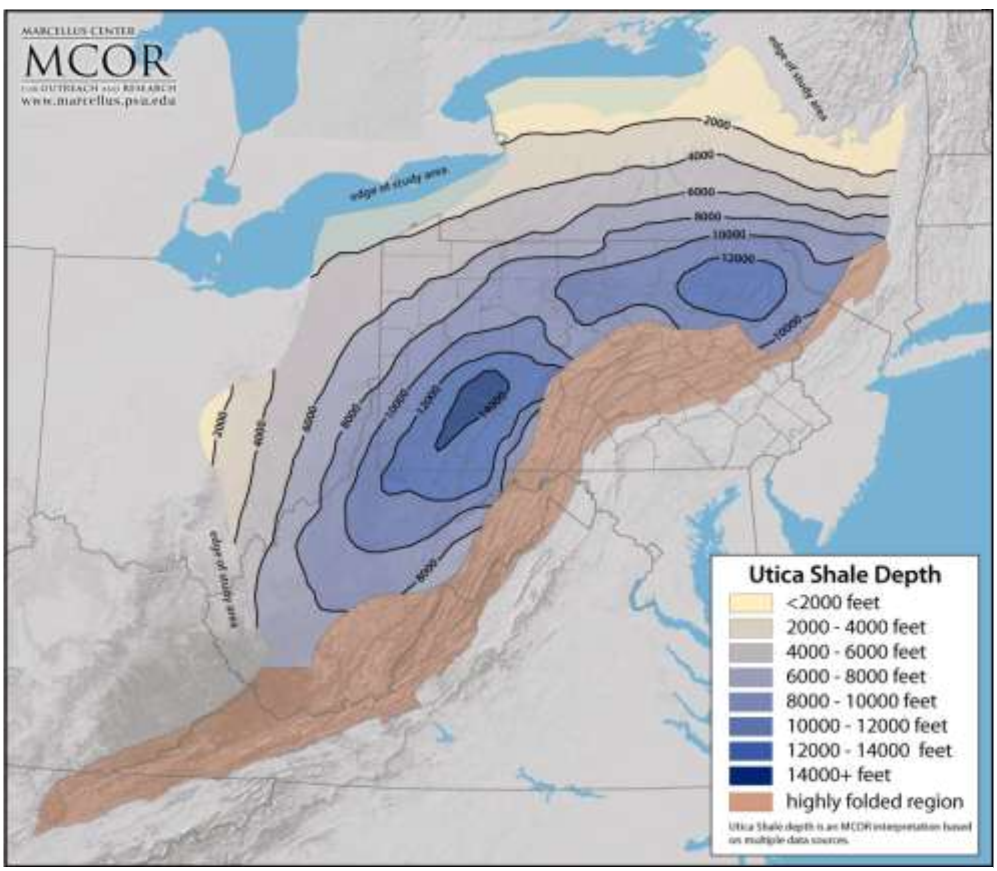


Figure 17. Depth of Utica Shale

Recent advances in technology and the growing energy demand has catapulted Pennsylvania into the Marcellus Shale gas extraction industry. The Marcellus Shale formation is believed to hold 84 trillion cubic feet of gas (USGS 2011). Its development has the potential to create thousands of jobs, boost the economy, and fuel the nation; however, there is a great debate over defining the balance necessary to develop this resource while preserving the environment, protecting the health of humans and wildlife, maintaining infrastructure, and guarding people's quality of life. The growth of the industry is outpacing Pennsylvania's ability to properly regulate it and protect human health and the environment.

Water Chemistry

Water chemistry and flow data for five stream sites and three Abandoned Mine Drainage (AMD) impacts are displayed in the *Paint Creek Restoration Plan*. All but one of these monitoring points are in and around the village of Mine 40, where AMD begins to affect Little Paint Creek. The one site that was not was on Fox's Run. Data from the most downstream monitoring point, LPC-S05, acquired in 2004 and 2005, indicate Little Paint Creek maintained a pH of 6.5, but had significantly more iron and aluminum than upstream of AMD impacts. According to the restoration plan, "There are only three AMD impacts to the water quality integrity of LPC [Little Paint Creek], the Jandy Discharge (LPC-D01), the Mine #40 Coal Refuse Pile, and the Mine #40 Discharge (LPC-D02)." The Jandy discharge and the coal refuse pile contribute 95.8% of the acidity loading, 99.8% of the iron loading, 99.9 % of the aluminum loading, and 83.8% of the manganese loading entering Little Paint Creek (Clark 2005). The good quality of the Mine #40 Discharge makes its remediation inconsequential.

Greenley Energy owns the former Jandy Coal Company Coal Refuse Pile. Several years ago, approximately 500,000 tons of refuse was moved from it to an adjacent permitted disposal site in cooperation with the DEP's Bureau of Abandoned Mine Reclamation. The contractor then installed erosion and sediment controls, filled in three ponds below the refuse pile, covered the disposal site with FBC [Fluidized Bed Combustion] ash, and regraded and revegetated the site (Clark 2005). The *Paint Creek Restoration Plan* states that, "Upon completion of the project, it was discovered that a discharge (LPC-D01) from an upslope reclaimed surface mine was still inputting heavy AMD loading into Little Paint Creek." The Jandy Discharge is comprised of this and surface water that infiltrates the refuse pile, as illustrated in Figure 18 from the *Paint Creek Restoration Plan*.

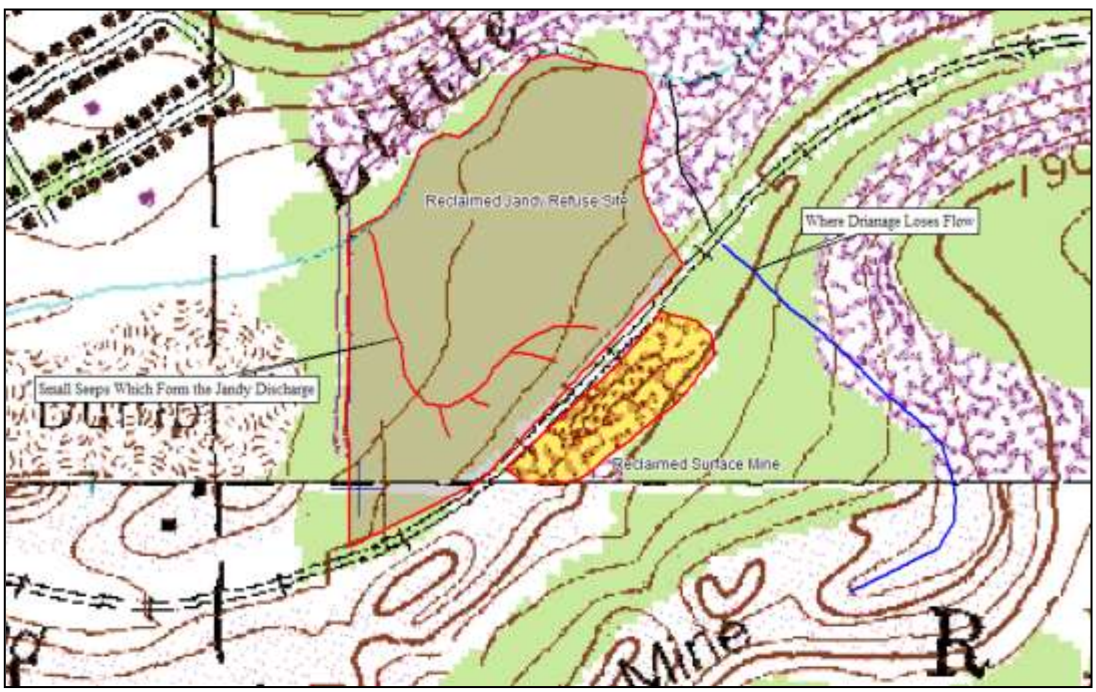


Figure 18. Drainage pattern of Jandy Discharge

PCRWA received a DEP Growing Greener grant in 2003 to study the Jandy Discharge and design a treatment method for it. The consultants recommended grouting the discharge and directing it into the mine pool, but not all partners were convinced this method would work and the project was tabled.

Greenley Energy Holdings of Pennsylvania, Inc., owns the Mine #40 Coal Refuse Pile. Two of the pile's three sections have been removed and burned at the Ebensburg Cogeneration Plant. These two sections were reclaimed with alkaline ash and vegetation. The *Paint Creek Restoration Plan* lists the remaining section as the largest AMD impact to Little Paint Creek. Despite inquiries, PCRWA could not find out when this pile would be removed.

The Conemaugh Valley Conservancy's Kiski-Conemaugh Stream Team, through an established partnership with the Pennsylvania Department of Environmental Protection, collected water samples from Little Paint Creek, at the Main Street Bridge, near the mouth of Little Paint Creek within the flood protection walls (Figure 19). This site is tagged as KSTLPCM (7488-361) in the DEP's Sampling Information System. Samples were collected monthly for two years and quarterly for four years between 2006 and present day. The PA DEP's Bureau of Laboratories analyzed these samples. Appendix 2 details the laboratory results from six years of water sampling.

At this site, below the village of Mine 40, the Jandy Discharge, and the Mine #40 Coal Refuse Pile, Little Paint Creek consistently had a pH between 6 and 8. Of 34 samples, the average pH was 7.19, as shown in Figure 20. The minimum alkalinity at this site was 11.20 mg/L and the maximum was 68.40 mg/L, while the average was 38.37 mg/L, as shown in Figure 21. The Pennsylvania Code 93 (Title 25 Watersheds/Water Quality) states that waterways should have a sustainable average alkalinity of 20 mg/L as $CaCO_3$ (Calcium carbonate) (Fry 2011).

Figure 19. Monitoring site KSTLPCM near the mouth of Little Paint Creek Photo by Melissa Reckner.

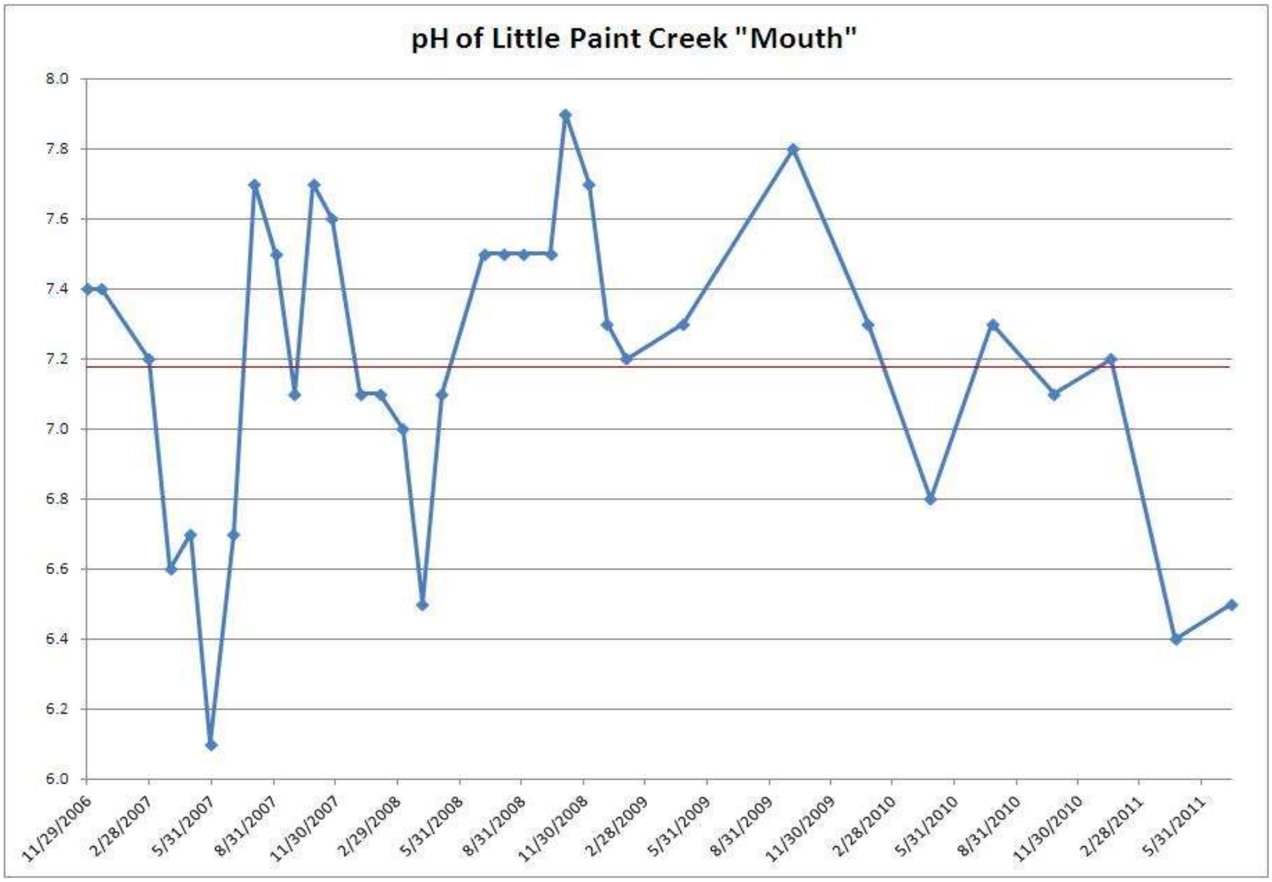


Figure 20. pH of Little Paint Creek near its mouth

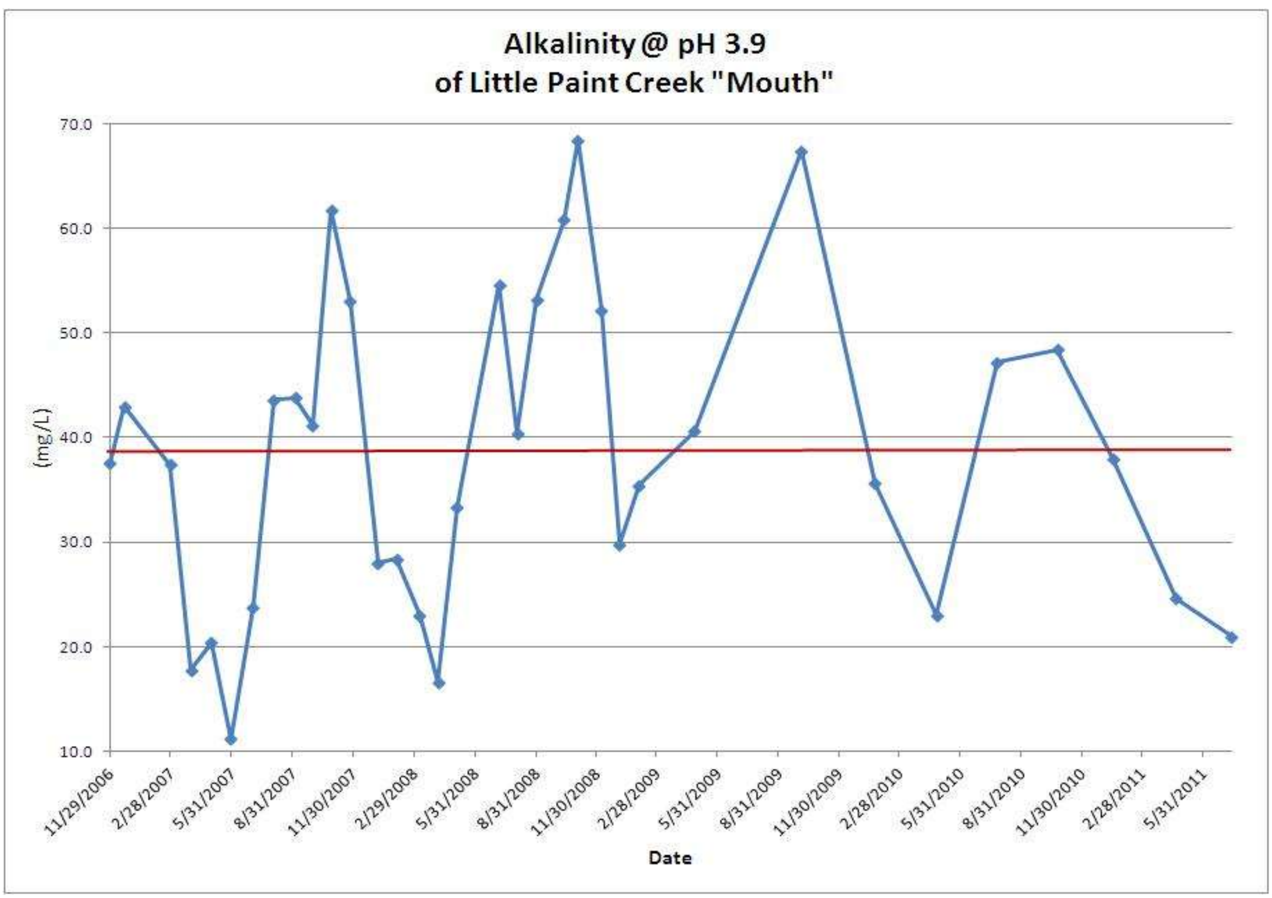


Figure 21. Alkalinity of Little Paint Creek near its mouth

The concentration of metals associated with AMD varied greatly over the sampling period at this site. The average total iron was 4.46 mg/L, with a minimum and maximum of 0.63 mg/L and 18.20 mg/L respectively. The average total aluminum was 1.77 mg/L, with a minimum of 0.53 mg/L and a maximum of 6.92 mg/L. The Pennsylvania Code states that iron concentrations should have a 30-day average of 1.5 mg/L. It also states that the maximum concentration of aluminum for fish and aquatic life is 0.750 mg/L. Little Paint Creek consistently exceeds the allowable concentrations for both iron and aluminum.

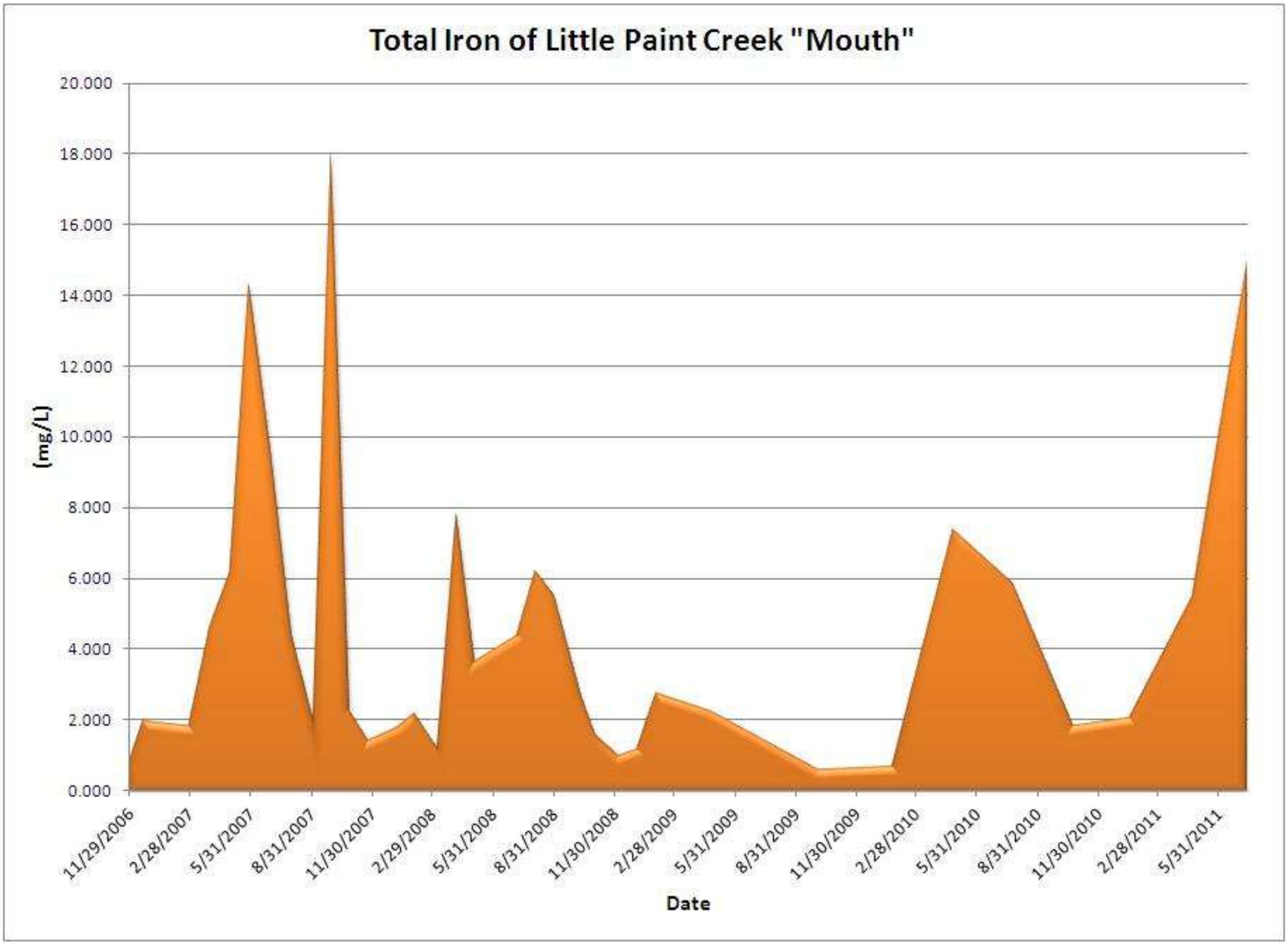


Figure 22. Iron concentrations of Little Paint Creek near its mouth from November 2006 – July 2011

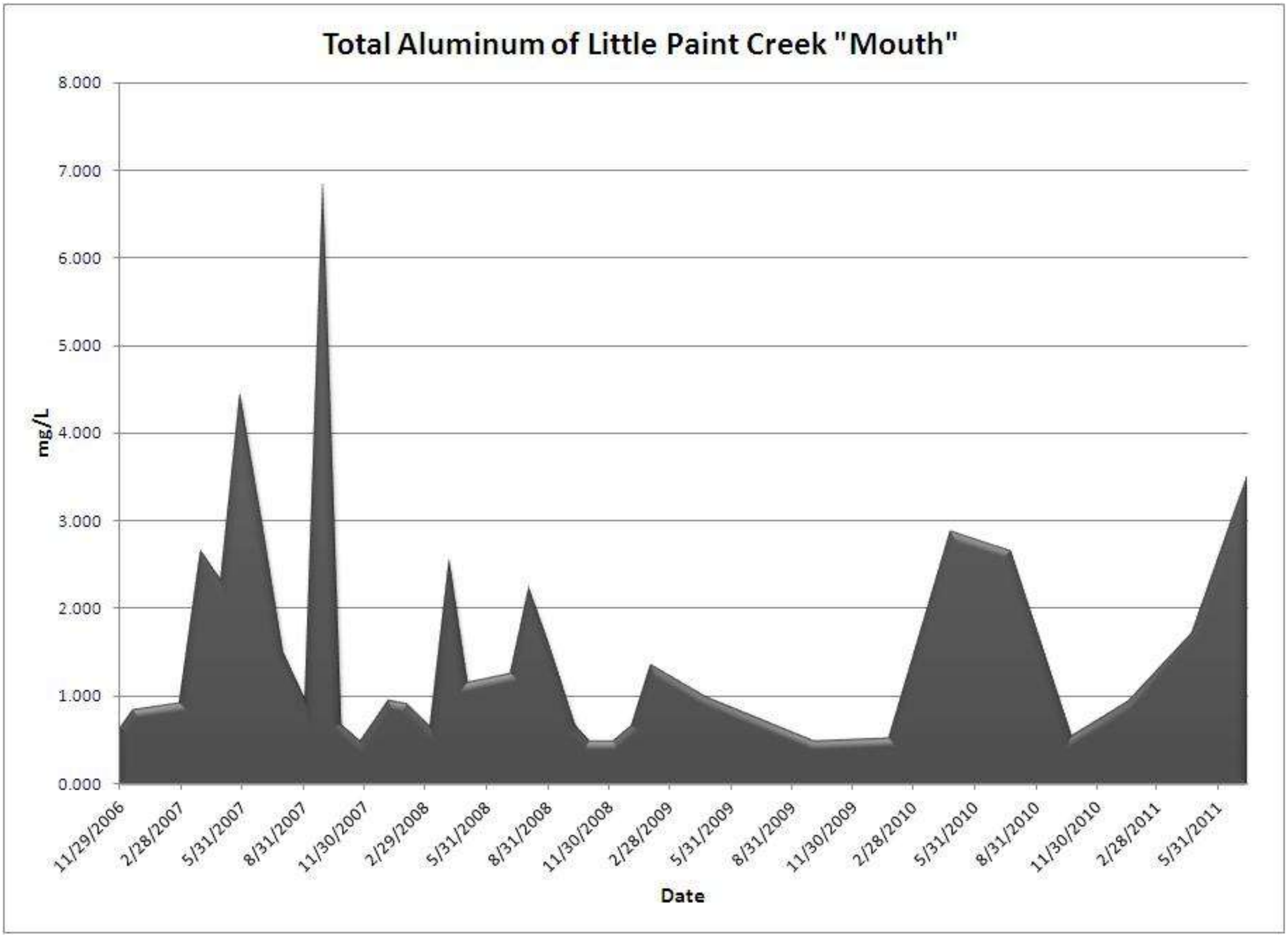


Figure 23. Aluminum concentrations of Little Paint Creek near its mouth from November 2006 – July 2011

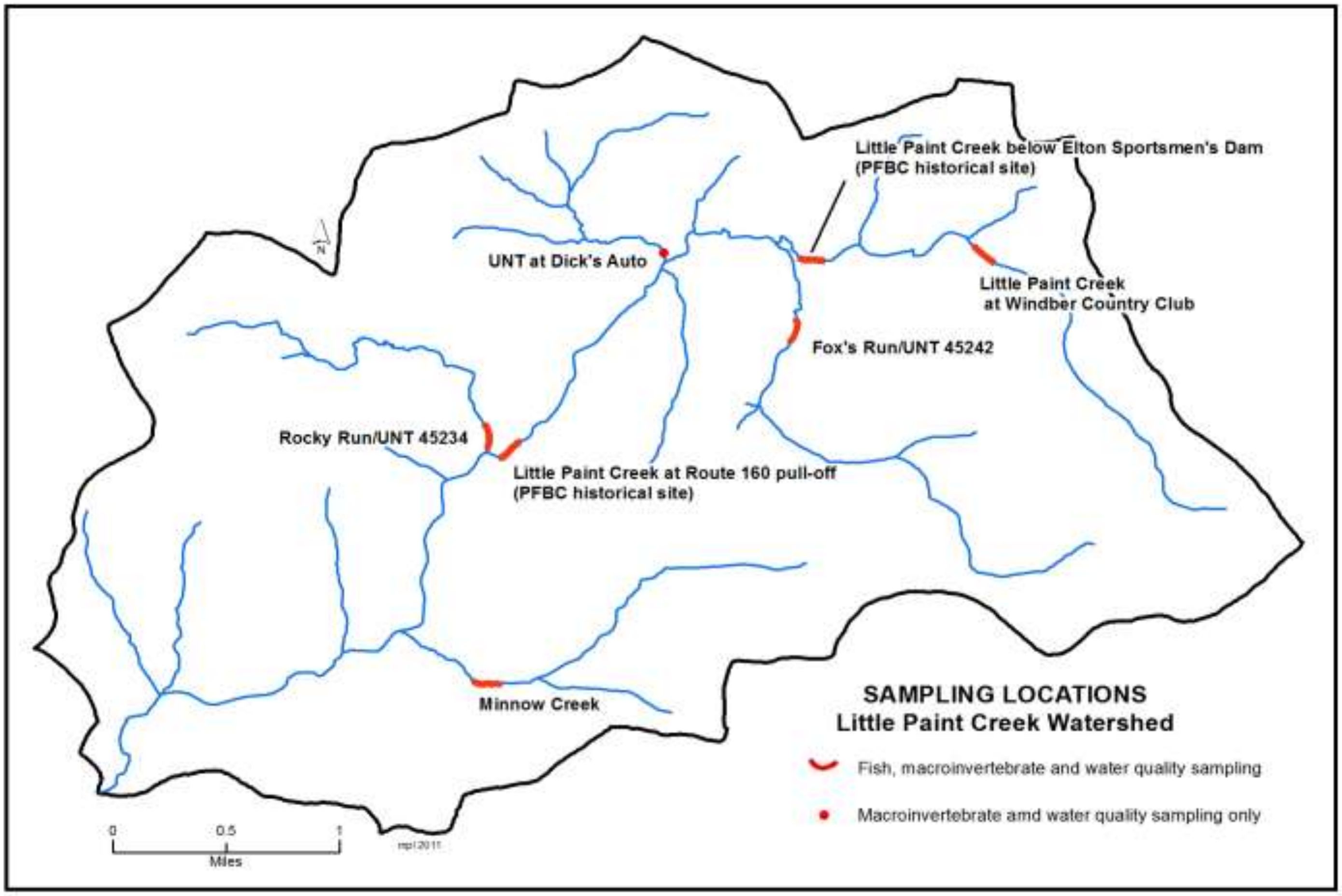


Figure 24. Fish, macroinvertebrate and water quality sampling sites 2010 - 2011

The Kiski-Conemaugh Stream Team collected water chemistry data from seven other locations throughout the Little Paint Creek watershed specifically for this plan. Monitoring sites are shown in Figure 24 and location information may be found in Appendix 1. Water quality data may be found in Appendix 2.

The stream sites with the coolest water temperature were those of Little Paint Creek above the Windber Country Club and Fox's Run, while the warmest was Little Paint Creek below the Elton Sportsmen's Dam. Fox's Run had the lowest recorded pH of all the sites in both the spring and fall with a 6.86 and 6.70 respectively. It also had the lowest alkalinity, with only 8 mg/L in both seasons. Fox's Run flows through a stretch of forest populated largely by hemlocks, which add tannic acid to the stream, and is a high gradient, infertile freestone headwater stream. Rocky Run had the highest pH of any site with a 8.12 in the fall and a 8.39 in the spring; however, it also had the highest levels of alkalinity, conductivity, chlorides, total dissolved solids. Rocky Run (UNT45234) is listed as impaired by petroleum activities, oil and grease on the PA DEP's 303d List of Impaired Waters. It drains a heavily populated suburb of the City of Johnstown where light industry, shopping centers, and residential areas abound. For water chemistry data from all sites, please view Appendix 2.

In 2010, the Somerset Conservation District, in partnership with the Kiski-Conemaugh Stream Team, placed a Solinst LTC LevelLogger Junior in Little Paint Creek, below the confluence of it and Rocky Run. This logger acquires stream temperature, level, and conductivity every 15 minutes. Data are downloaded every two weeks, weather permitting. Recently, the Conemaugh Valley Conservancy's Aquatic Biologist reviewed the first year of continuous, long-term data from this site. His summation follows.

> Between September 2010 and August 2011, the average conductivity measured by the logger was 180.27 uS/cm, the maximum conductivity was 1,115.08 uS/cm, and the minimum was 59.17 uS/cm.
>
> The conductivity gradient of Little Paint Creek changed seasonally. The winter season contained the most spikes in conductivity. The maximum conductivity reading of 1,115.08 uS/cm was recorded in February 2011. The spikes were related to water level increase from January to mid-February. This can be explained by the runoff of snowmelt containing road salt entering the stream through overland flow. Other spikes in this time period show no relation to level. Some occurred at base flows, while others occur at storm flows.
>
> Spring data indicated spikes occurring as frequently as winter, but the spikes were not as high as winter conductivity spikes. As in winter, spring spikes occurred at storm and base flows. Summer conductivity readings exhibited lower spikes with less frequency and lower values for the spikes. Fall data exhibited the least amount of spikes and lowest conductivities for the sampling period.
>
> The conductivity increases (excluding salt input from winter runoff) are indicative of a discharge. Upstream of the logger location is the confluence of Rocky Run and Little Paint Creek. Rocky Run originates in an industrialized area containing multiple factories and businesses. CVC and Saint Francis University traced high conductivity readings to Rocky Run and upstream to the industrial sites. Further investigation yielded elevated pH and conductivity in manmade wetlands draining into Rocky Run as well as the main stem of Rocky Run. The higher conductivity and pH readings obtained through the recon process indicate that an industrial pollutant or pollutants are present in Rocky Run. This explains the spikes in Little Paint. The pollutant(s) could be industrial cleaners and surfactants with basic properties (hence the elevation in pH and conductivity). Pollutants of this nature do not require large volume inputs to produce high readings. These pollutants are harder to dilute and tend to remain in solution.

Saint Francis University's Environmental Engineering class confirmed Rocky Run's poor quality, compared to Little Paint Creek, in 2011 with the placement of three YSI Instruments 600 XLM V2 Multi-parameter Water Quality sondes, equipped to monitor pH, conductivity, dissolved oxygen, and temperature. Under the supervision of their professors, students placed a sonde in the lower end of Rocky Run, another in Little Paint Creek before its confluence with Rocky Run, and a third in Little Paint Creek below the confluence of the two streams. After three weeks, students retrieved the sondes and analyzed the data. Their data confirmed that the high levels of conductivity are originating in Rocky Run (Appendix 2). Water testing on November 15, 2010 with a Hanna All-in-One meter along the length of Rocky Run showed elevated conductivity levels, particularly in the stormwater retention wetland adjacent the Richland Towne Centre shopping complex. Here, conductivity measured 1,612 uS/cm. Downstream readings ranged from 626-1,033 uS/cm.

Figure 25. Elevated conductivity in Rocky Run
Photo by Eric Null

Figure 26. Culvert in the headwaters of Rocky Run
Photo by Melissa Reckner

Figure 27. Saint Francis University students deploy their sonde in Rocky Run
Photo by Dr. William Strosnider

Biology

Benthic Macroinvertebrates

In September 2010 and May 2011, CVC and partners assessed the benthic macroinvertebrate communities of seven sites throughout the watershed. Three of these sites were located on the mainstem of Little Paint Creek, while the remaining four sites were located on the major tributaries of Little Paint Creek. See Figure 24 for a map of these locations.

Samples were collected per United States Environmental Protection Agency (EPA) protocol using a 0.3 square meter Surber Sampler. Surber Samplers are used for macroinvertebrate population monitoring because they provide a quantitative sampling technique that yields extrapolative results about the health of a given stream reach. Five subsamples were collected from across riffle areas at each site (Barbour et al. 1999). The samples were preserved in 70% isopropyl alcohol. Later, at the CVC office, samples were pooled for each site, sorted, and identified by CVC's Aquatic Biologist to the lowest taxonomic level practicable, usually genus level. After identification, several metrics were used to determine the health of the macroinvertebrate communities. Metrics used measured species richness, percent mayflies, stoneflies, and caddisflies (EPT index), organic loading (Hilsenhoff index), percent dominant taxa, mean diversity, percent acid tolerant versus percent acid intolerant taxa, and total individuals collected for each site. These metrics allow CVC to assess the stream health by measuring the community composition of various macroinvertebrate taxa.

The following is a key to the site abbreviations in subsequent graphs and charts.

Site Abbreviation	Site Description
LP US CC	Little Paint Creek upstream of the Windber Country Club.
LP Below Elton	Little Paint Creek Below the Elton Sportsmen's Club dam, a historical PFBC sampling site.
LP 160	Little Paint Creek upstream of the State Route 160 Bridge, a historical PFBC sampling site.
Fox Run	UNT 45242, locally known as Fox's Run, upstream of the State Route 303 Bridge.
UNT at Dicks	An unnamed tributary. Sampling site was downstream of State Route 160 Bridge, near Dick's Auto Sales.
Rocky Run	UNT 45234, locally known as Rocky Run. Sampling site near the mouth of tributary.
Minnow Creek	An unnamed tributary, locally known as Minnow or Minnie Creek. Sampling site was upstream of State Route 160 Bridge.

Table 2. Key to monitoring sites

Specific benthic macroinvertebrate metrics can be used to measure for acid impacts. The metrics used in this survey to evaluate the effects of acidity on the Little Paint Creek watershed were percent composition of mayfly, stonefly and caddisfly taxa (Percent EPT). Usually when acid impacts are present, caddisfly and mayfly numbers will decrease, while some stonefly taxa, which are acid tolerant, flourish. The results of the EPT index for fall 2010 and spring 2011 are located in Figure 28.

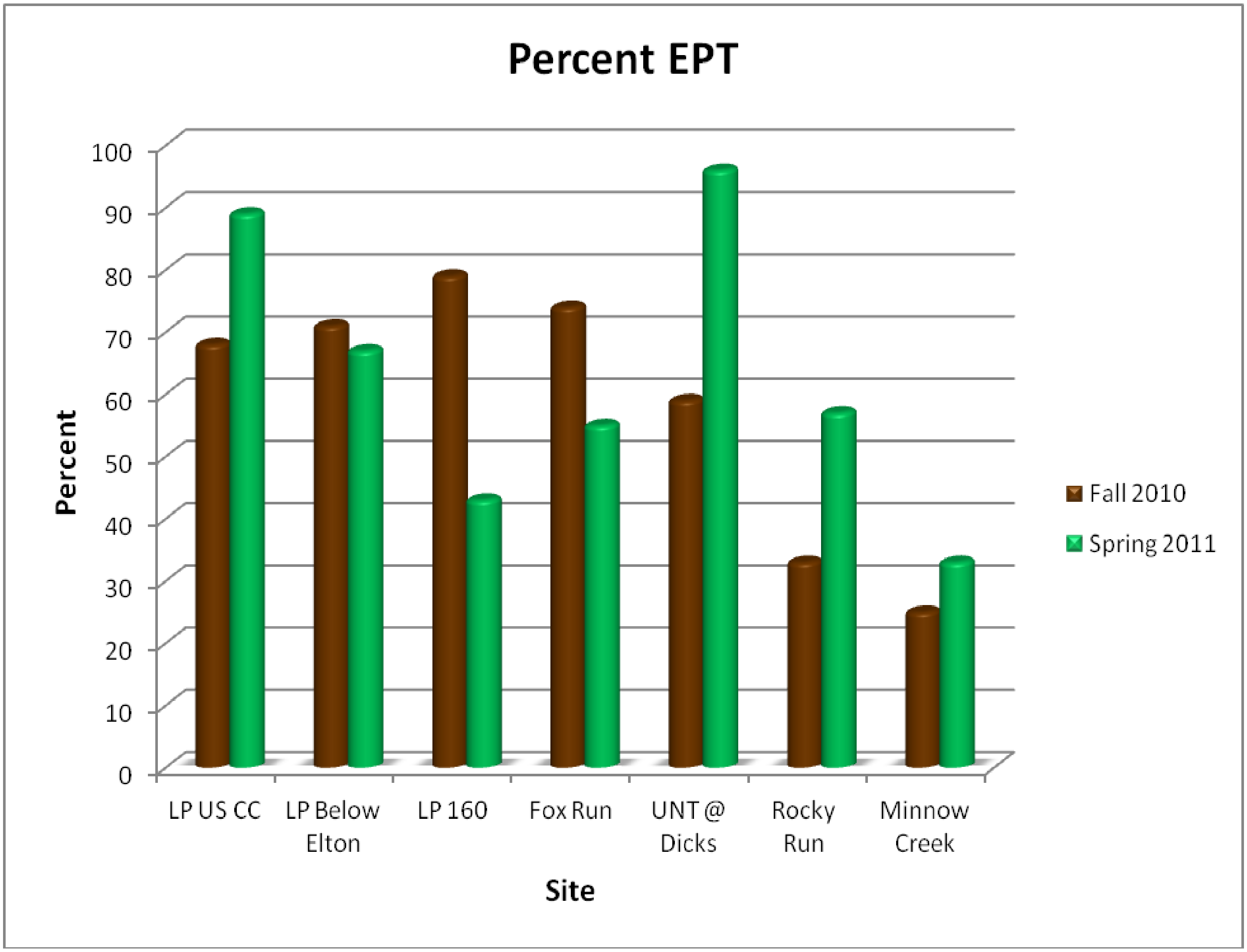
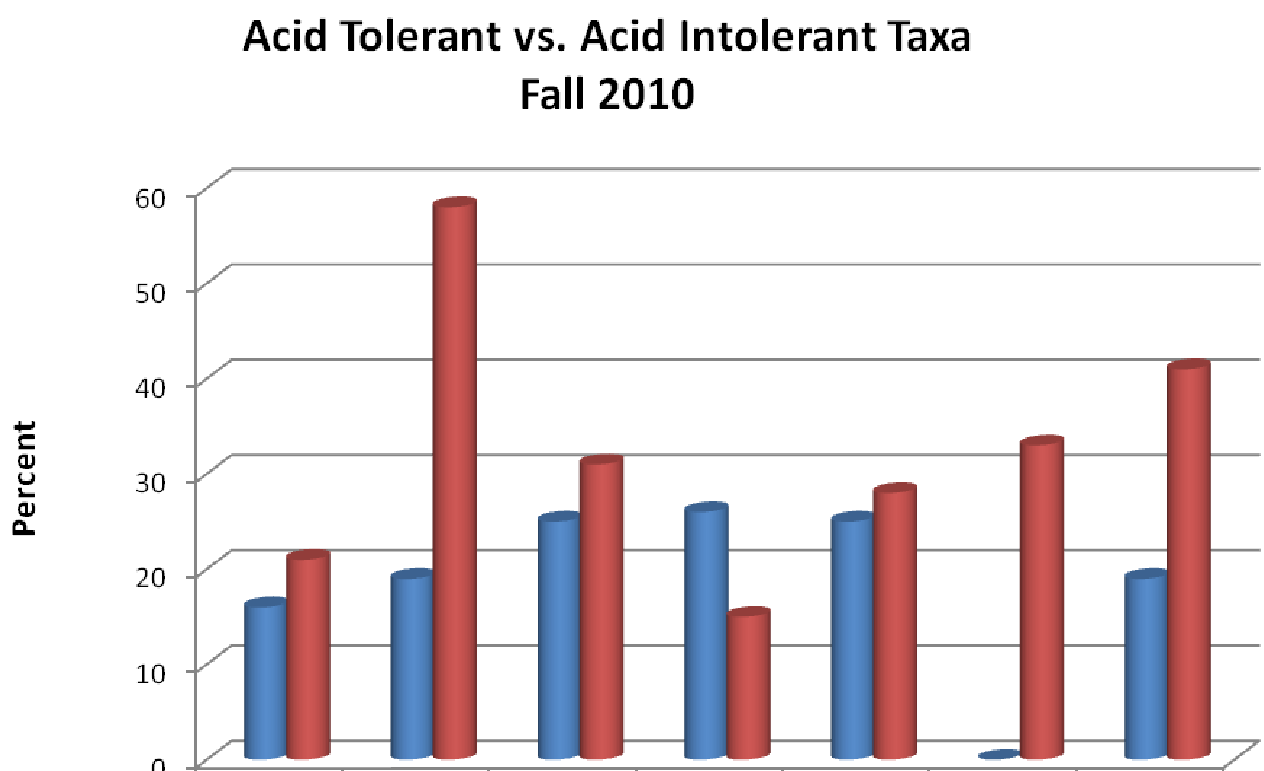


Figure 28. Percent composition of EPT (mayfly, stonefly, caddisfly) taxa

The EPT results indicate that mayflies, stoneflies and caddisflies compose the majority of taxa collected in the spring and fall in the mainstem of Little Paint Creek, Fox's Run, and the unnamed tributary near Dick's Auto. Rocky Run and Minnow Creek have less EPT taxa.

Another metric used to measure acidity is the comparison of strictly acid tolerant taxa with strictly acid intolerant taxa. These acid tolerant taxa are the taxa that have specialized to survive in acidic conditions. If the percent composition of these individuals composes most of the sample, the likelihood of acid impacts is greater. The results for the acid tolerant to acid intolerant comparisons are located in Figures 29 and 30.



	LP US CC	LP Below Elton	LP 160	Fox Run	UNT @ Dicks	Rocky Run	Minnow Creek
Acid Tolerant	16	19	25	26	25	0	19
Acid Intolerant	21	58	31	15	28	33	41

Figure 29. Percent acid tolerant taxa versus acid intolerant taxa ~ Fall 2010

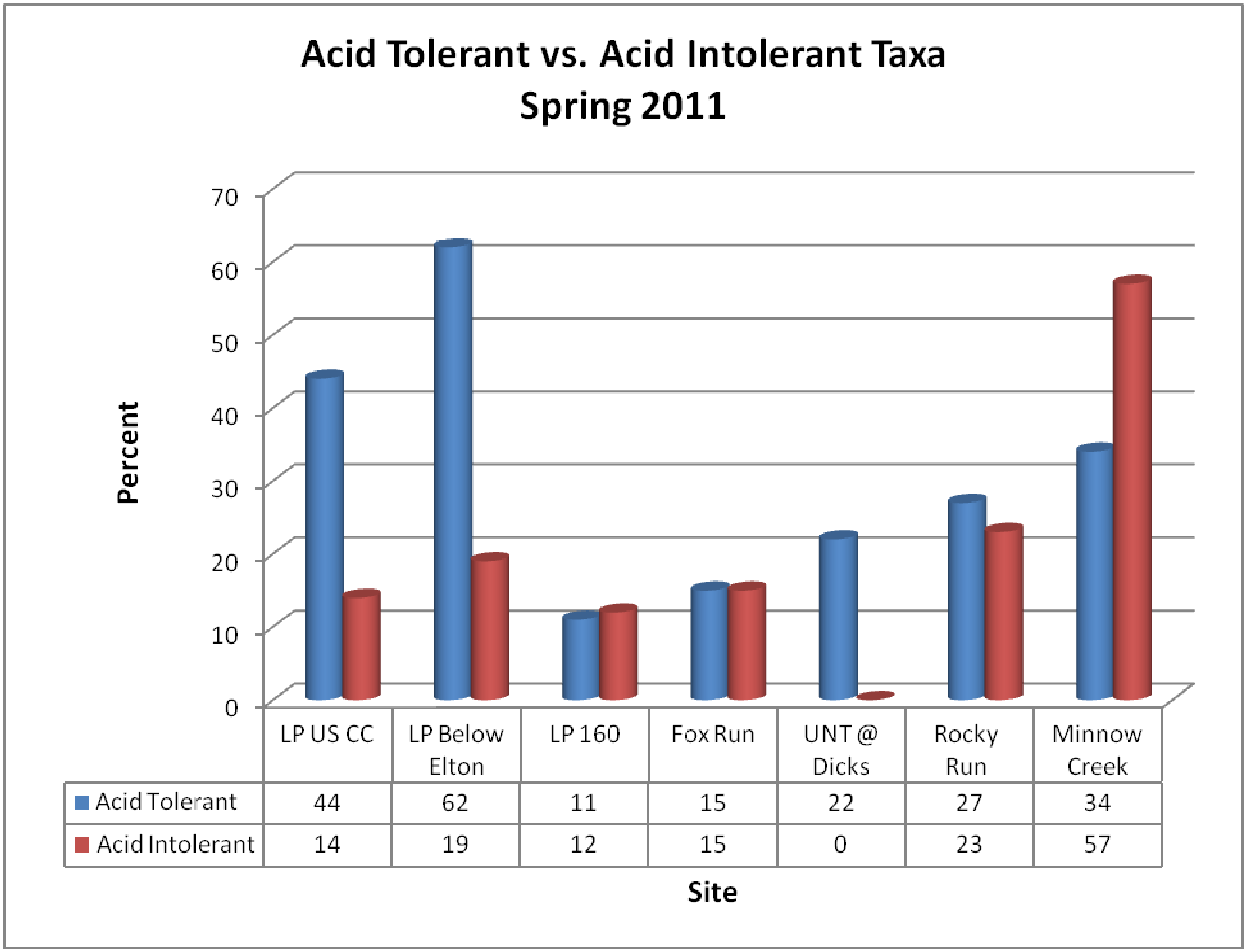


Figure 30. Percent acid tolerant taxa versus acid intolerant taxa ~ Spring 2011

In the fall sampling, acid tolerant individuals composed less percentages in all sites except Fox's Run, while in the spring sampling, acid tolerant individuals composed the majority of all taxa collected, except in the mainstem of Little Paint at State Route 160 and in Minnow Creek. When acid tolerant individuals dominate in both fall and spring samples this indicates the presence of an acid pollutant. When acid tolerant individuals dominate in the spring samples only, this indicates the possible presence of other pollutants, since the typical spring taxa that are acid tolerant are also tolerant to other pollutants. The domination of acid tolerant taxa in spring samples can indicate mild acid impacts.

Organic loading impacts are measured using the Hilsenhoff Biotic Index (HBI). HBI scores increase as organic loading increases. HBI scores above 4.0 indicate organic loading is occurring within the stream reach (Barbour et al. 1999). The results for the HBI are located in Figure 31.

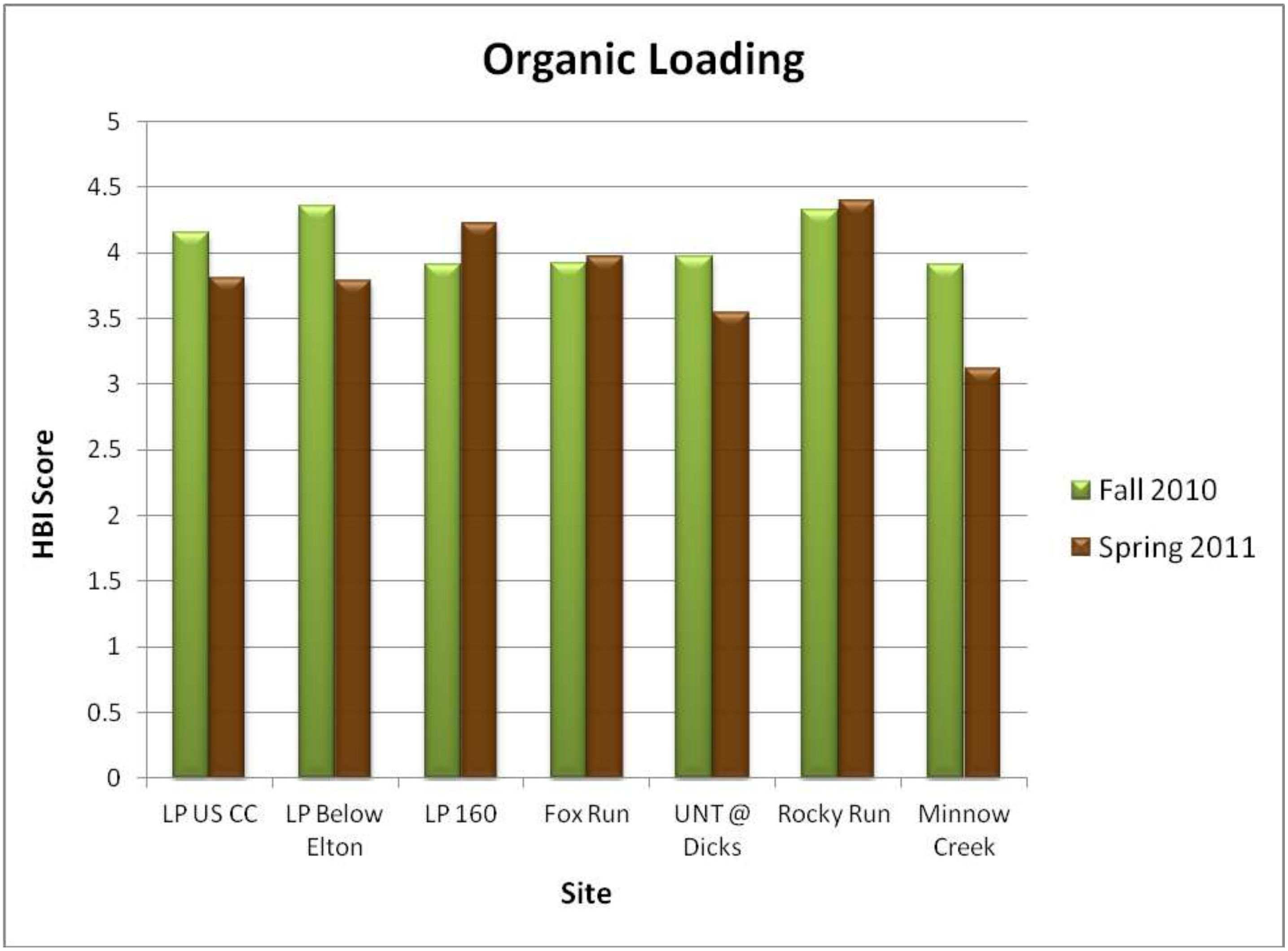


Figure 31. HBI scores for sites in the Little Paint Creek watershed

The HBI scores indicated that Little Paint Creek below the Elton Sportsmen's Dam and Little Paint Creek above the Windber Country Club had elevated HBI scores in the spring, while Little Paint Creek at Route 160 had an elevated score in the fall. Rocky Run possessed elevated scores in both sampling periods.

Other metrics were used as indicators of community disruption. Metrics such as mean diversity, percent composition of dominant taxon, species richness, and total individuals collected reflect the community's health.

Mean diversity indicates if the community is evenly distributed. Evenly distributed communities indicate healthy communities. Fox's Run, Minnow Creek, and Little Paint Creek above the Windber Country Club and at the State Route 160 crossing had evenly distributed macroinvertebrate communities (Figure 32).

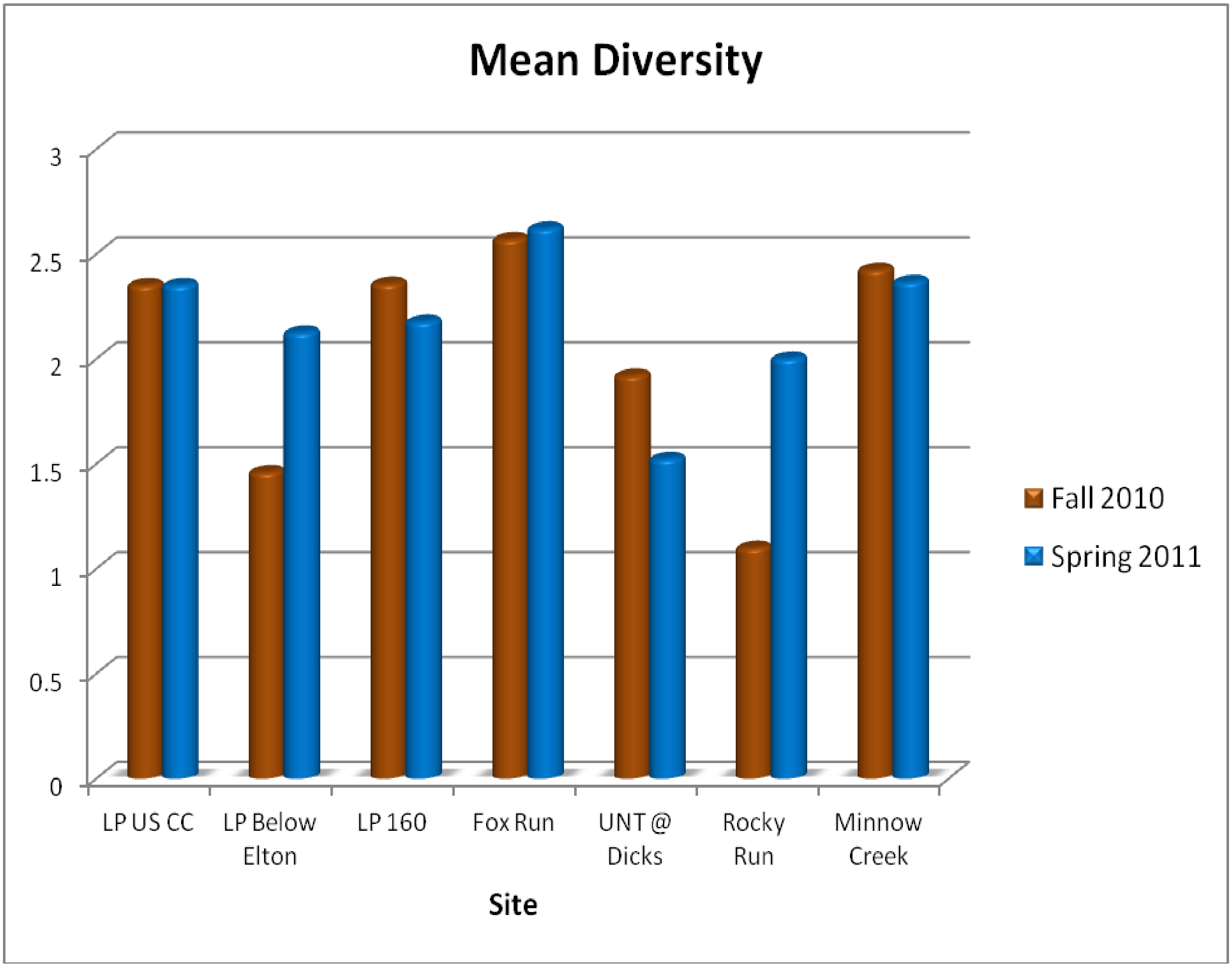
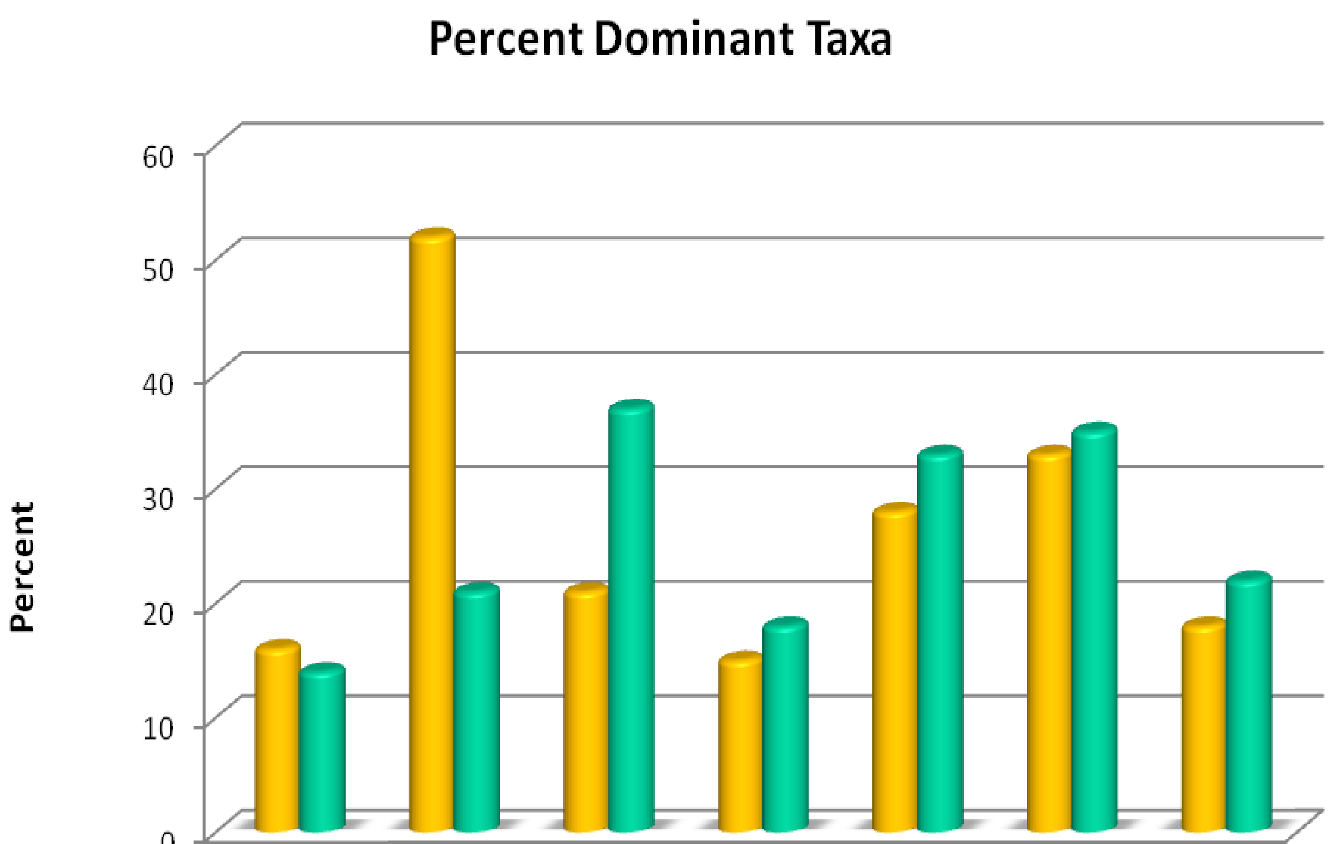


Figure 32. Mean diversity of Fall 2010 and Spring 2011 macroinvertebrates in the Little Paint Creek watershed

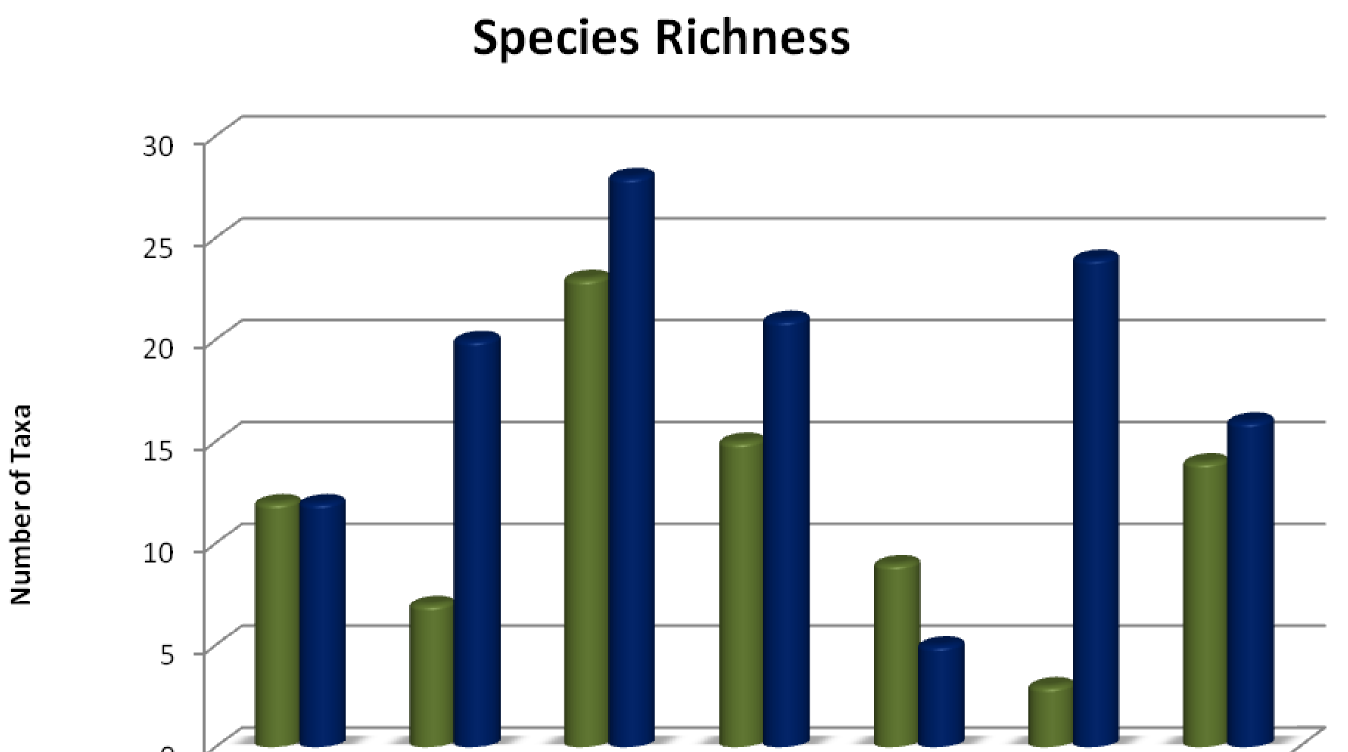
For communities that are not evenly distributed, like those in Rocky Run and the unnamed tributary to Little Paint Creek at Dick's Auto, metrics like percent dominant taxon measure the composition of the most frequently collected taxa in a site. For example, if one individual composes the majority of the sample, the community at that site will be less diverse, which can indicate a stressor. The results of this metric are located in Figure 33.



	LP US CC	LP Below Elton	LP 160	Fox Run	UNT @ Dicks	Rocky Run	Minnow Creek
Fall 2010	16	52	21	15	28	33	18
Spring 2011	14	21	37	18	33	35	22

Figure 33. Percent dominant macroinvertebrate taxa at select sites in the Little Paint Creek watershed ~ Fall 2010 and Spring 2011

Species richness and total individuals collected are measures of community diversity and robustness. When water quality increases, usually species richness increases. When organic pollutants degrade the water quality, total individuals increase. If a stream is mildly impacted by acid, species richness decreases and total individuals increase. Streams that have severe acid impacts have decreased total individuals and species richness (Barbour et al. 1999). The results for these metrics are located in Figures 34 and 35.



	LP US CC	LP Below Elton	LP 160	Fox Run	UNT @ Dicks	Rocky Run	Minnow Creek
Fall 2010	12	7	23	15	9	3	14
Spring 2011	12	20	28	21	5	24	16

Figure 34. Species richness of Fall 2010 and Spring 2011 macroinvertebrates from select sites in the Little Paint Creek watershed

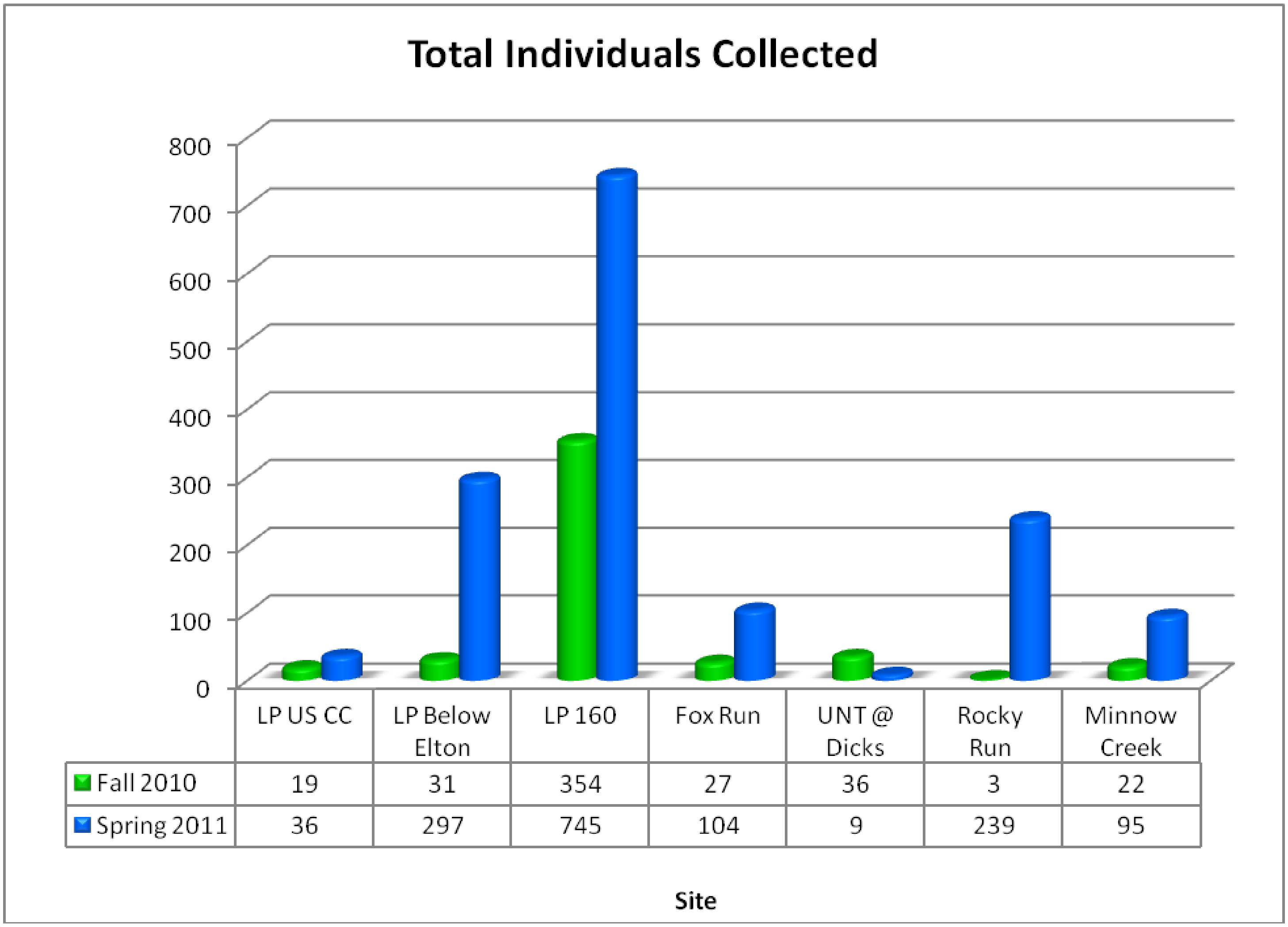


Figure 35. Total individuals collected from select sites in the Little Paint Creek watershed Fall 2010 and Spring 2011

The diversity index indicates stressed communities due to low scores in the unnamed tributary at Dick's and Little Paint Creek below the Elton Sportsmen's Dam. Rocky Run exhibited low diversity in the fall sampling period. Little Paint below the Elton Sportsmen's Dam exhibited a very high composition of the dominant taxon in the fall, which coincides with its low diversity scores. The percent dominant taxon is high on the lower Little Paint Creek mainstem sites. The species richness and total individuals collected indicate that the unnamed tributary contains the least diverse taxa in the watershed.

The macroinvertebrate indices indicated that Fox's Run contained the best overall community structure. Little Paint Creek below State Route 160 had a diverse fall community, but was dominated by tolerant taxa in spring. Even with domination by tolerant taxa in spring, this site included the best community of the mainstem sites sampled. The unnamed tributary at Dick's Automotive had the most stressed community that was sampled. Siltation, industrial runoff, and substantial lack of a riparian buffer contribute to the poor community structure. All sites indicate the presence of moderate organic loading, partially due to the suburban development occurring within the watershed. The metrics indicate a coldwater resource that is impacted by thermal sources and siltation.

Fishes

The Pennsylvania Fish and Boat Commission (PFBC) and the Windber Sportsmen's Club stock the mainstem of Little Paint Creek. As shown in Tables 3 and 4, the PFBC has been stocking 8-18 inch brook and 8-20 inch brown trout prior to and during the trout season since at least 2003 (PFBC 2011). The Windber Sportsmen's Club annually stocks Little Paint Creek with a total of 1,800 to 2,100 trout from pre-season through mid-June.

Anglers can be seen along Little Paint Creek on opening day and throughout the season.

The PFBC annually stocks the lower mainstem of Little Paint Creek from Elton Sportsmen's Dam to the T-305 (Berwick Road) with catchable size trout. The mainstem is managed as a put-and-take trout fishery for recreational anglers to enjoy primarily in the spring season. While this portion is stocked and used as a recreational fishery, there is very little information available on the fisheries and stream health that is present in the major tributaries and headwaters of Little Paint Creek.

Figure 36. Brown trout recovered during fish survey ~ September 2010
Photo by Len Lichvar

Recent brook trout stocking history of Little Paint Creek, Section 02 (Cambria County, 18E)	
Stocking date	**Average Size**
3/20/2003	8 to 16 inches
4/17/2003	8 to 15 inches
3/24/2004	8 to 17 inches
4/22/2004	9 to 16 inches
5/20/2004	10 to 16 inches
3/24/2005	10 to 17 inches
4/21/2005	10 to 16 inches
5/19/2005	10 to 16 inches
3/23/2006	9 to 16 inches
4/20/2006	10 to 15 inches
5/18/2006	10 to 15 inches
3/22/2007	10 to 18 inches
5/11/2007	10 to 12 inches
3/20/2008	10 to 15 inches
5/9/2008	10 to 12 inches
4/10/2009	10 to 18 inches
5/14/2009	10 to 12 inches
4/9/2010	10 to 17 inches
5/13/2010	10 to 12 inches

Table 3. Brook trout stocking history of Little Paint Creek Source: PA Fish and Boat Commission

Recent brown trout stocking history of Little Paint Creek, Section 02 (Cambria County, 18E)	
Stocking date	**Average Size**
4/17/2003	8 to 16 inches
5/21/2003	9 to 15 inches
4/22/2004	9 to 17 inches
5/20/2004	9 to 15 inches
4/21/2005	9 to 16 inches
5/19/2005	10 to 15 inches
4/20/2006	10 to 20 inches
5/18/2006	10 to 15 inches
5/11/2007	10 to 18 inches
5/9/2008	10 to 12 inches
5/14/2009	10 to 12 inches
5/13/2010	10 to 12 inches

Table 4. Brown trout stocking history of Little Paint Creek Source: PA Fish and Boat Commission

Elton Sportsmen's Dam

Elton Sportsmen's Dam is a 3.5 acre earthen-fill dam on Little Paint Creek. It is owned by the Berwind Coal Company and leased to Adams Township (Wisniewski et al. 2001). According to the PFBC, its "average depth is 2.0 m with a maximum depth of 3.0 m and only surface water releases can be made. Elton Sportsmen's Dam is accessible from SR 0160. The lake is open for public fishing, including ice fishing and nights fishing, however, boats are not permitted.

Currently, fish populations in Elton Sportsmen's Dam are managed under statewide regulations. PFBC has stocked catchable brook trout, catchable brown trout, and catchable rainbow trout under the Class 1 Lake strategy since 1964. Elton Sportsmen's Dam receives one preseason planting of brook trout and brown trout and two in season plants of brown trout and rainbow trout," (Wisniewski et al. 2001). The stocked-trout fishery at Elton Sportsmen's Dam is a popular location for anglers.

Elton Sportsmen's Dam was first surveyed by PFBC in April 2000 to assess its fish community and update fisheries management strategies for the lake; however, PFBC did complete a chemical profile in April 1993. The PFBC noted that the pH of the dam's water fell from 6.9 in April 1993 to 6.3 in April 2000 and its total alkalinity decreased from 30 mg/L to 9 mg/L causing PFBC to deem the waters infertile in April 2000. The PFBC speculates that, "The low alkalinity and the presence of a coolwater environment may be reasons that Elton Sportsmen's Dam is infertile and slow fish growth occurs. The warmwater and coolwater fish community provides only a low quality fishery at Elton Sportsmen's Dam." They noted, "Little Paint Creek has also shown low alkalinity levels of 12 mg/l and 21 mg/l in past surveys," (Wisniewski et al. 2001).

Figure 37. Elton Sportsmen's Dam
Photo by Melissa Reckner

Fish Sampling

PFBC and partners sampled fish at five of the seven sampling sites in the Little Paint Creek watershed during the week of September 21, 2010. Another site, Minnow Creek, was surveyed on November 4, 2011 by Western Pennsylvania Conservancy (WPC). Fish were not collected from the small, unnamed tributary by Dick's Auto.

PFBC collected fish using an AC backpack electrofishing unit set at 450 volts and 125 watts. All fish captured were enumerated and identified to species level. Gamefish were measured to the nearest 25mm. WPC collected fish from Minnow Creek using an AC backpack electrofishing unit set at 300 volts for a total effort of 2,185 seconds. All fish were promptly returned to the streams where they were collected after measurements and identifications were completed. The species found at each survey site are located in Appendix 4. The species composition of the Little Paint Creek watershed is located in Figure 41. The composition of the individual sites is located in Figures 42 to 44 and 46 to 48.

Figure 38. PFBC, SCD, and KCST staff survey Little Paint Creek in September 2010
Photo by Len Lichvar

Figure 39. Rock bass found in Little Paint Creek below the Elton Sportsmen's Dam
Photo by Len Lichvar

Fish Species Captured During 2010 – 2011 Electrofishing Surveys		
Common Name	**Scientific Name**	**Quantity**
Blacknose Dace	*Rhinichthys atratulus*	589
Bluegill	*Lepomis macrochirus*	50
Brown Bullhead	*Ameiurus nebulosus*	3
Brook Trout (Hatchery)	*Salvelinus fontinalis*	1
Brook Trout (Wild)	*Salvelinus fontinalis*	14
Brown Trout (Hatchery)	*Salmo trutta*	5
Creek Chub	*Semotilus atromaculatus*	395
Golden Shiner	*Notemigonus crysoleucas*	1
Largemouth Bass	*Micropterus salmoides*	11
Mottled Sculpin	*Cottus bairdii*	850
Pumpkinseed	*Lepomis gibbosus*	51
Rock Bass	*Ambloplites rupestris*	3
Silverjaw Minnow	*Notropis buccatus*	1
White Sucker	*Catostomus commersonii*	72
	TOTAL INDIVIDUALS	**2046**
	TOTAL SPECIES	**14**

Table 5. Fish species captured in 2010 and 2011 surveys of Little Paint Creek and its tributaries

Figure 40. Wild brook trout of various classes captured in Fox's Run, September 2010
Photo by Len Lichvar

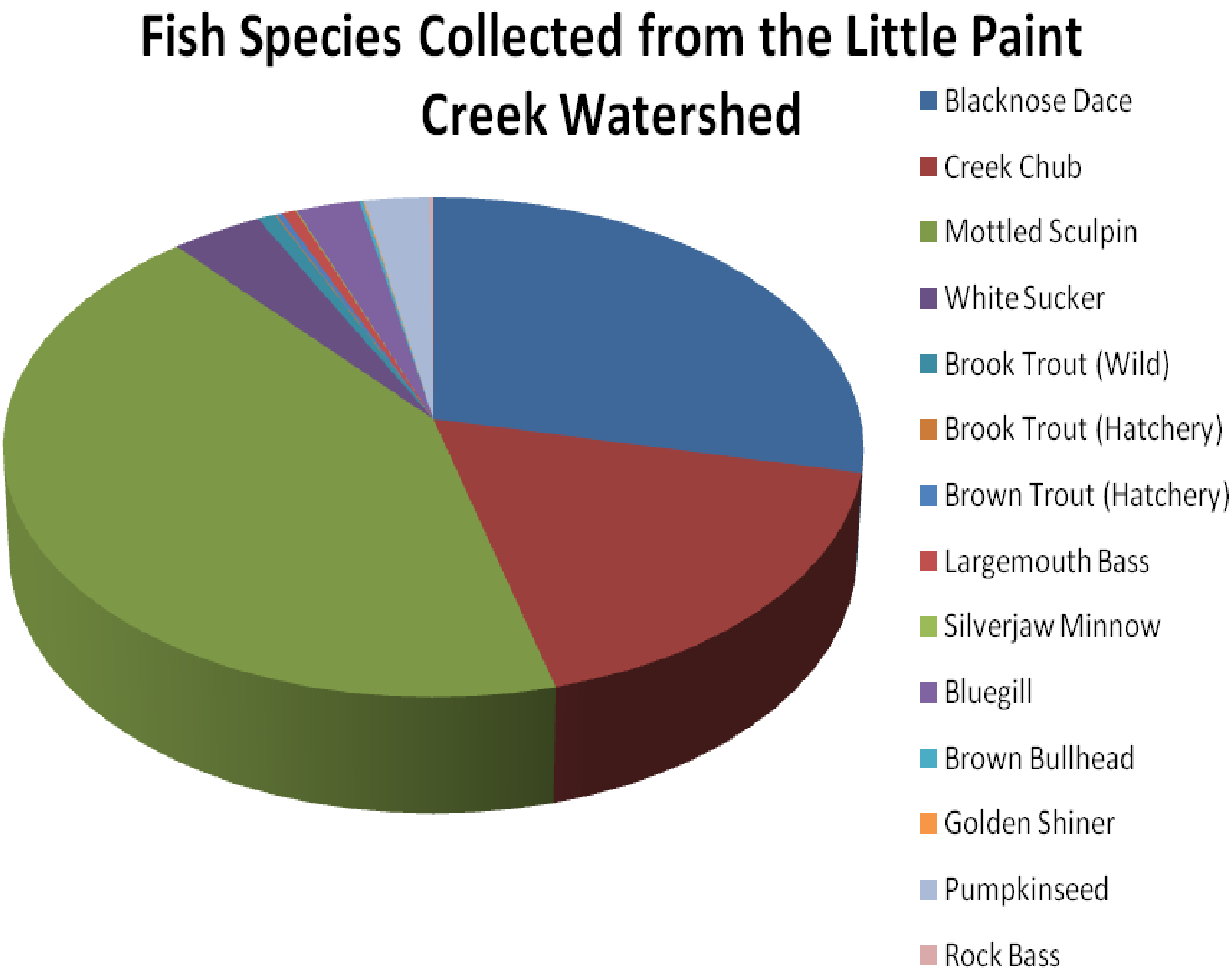

Fish Species Collected from the Little Paint Creek Watershed
Blacknose Dace
Creek Chub
Mottled Sculpin
White Sucker
Brook Trout (Wild)
Brook Trout (Hatchery)
Brown Trout (Hatchery)
Largemouth Bass
Silverjaw Minnow
Bluegill
Brown Bullhead
Golden Shiner
Pumpkinseed
Rock Bass

Figure 41.

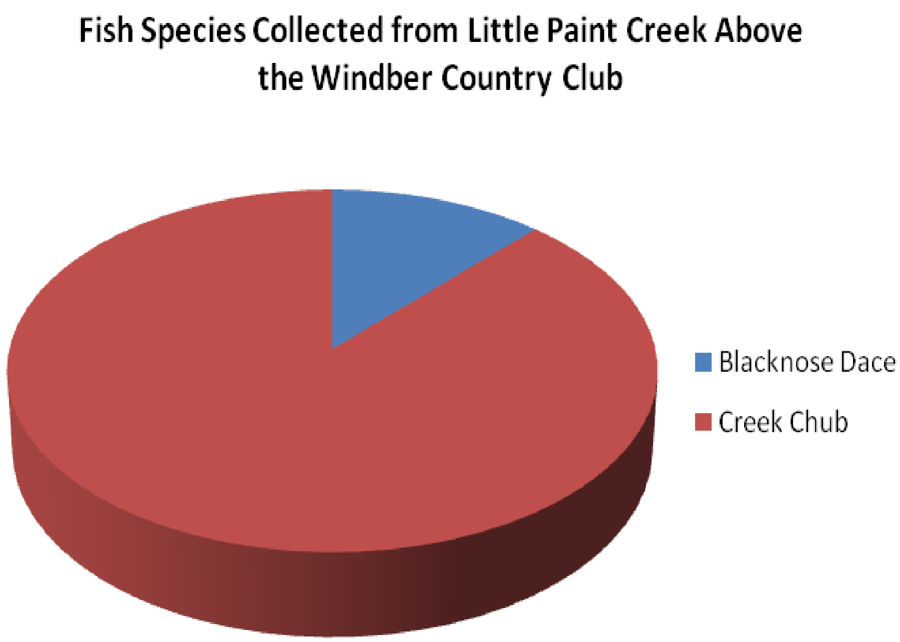


Figure 42.

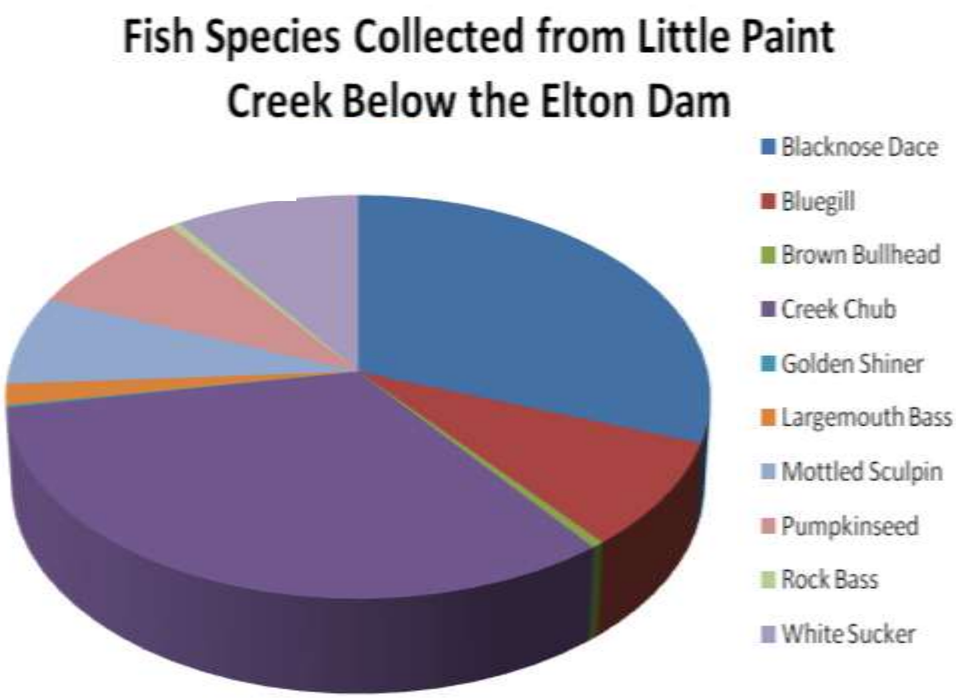


Figure 43.

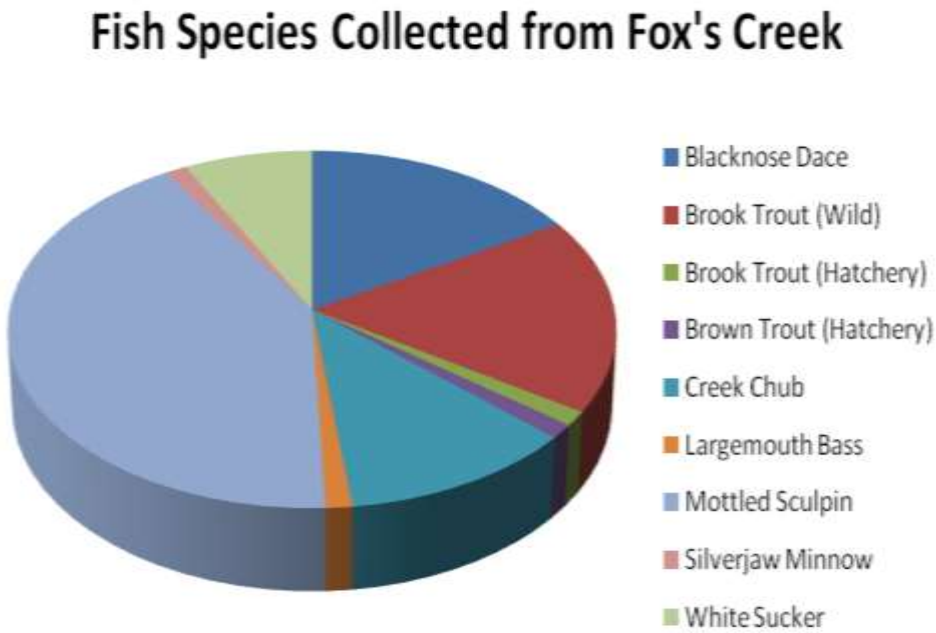


Figure 44.

Figure 45. Wild brook trout captured in Fox's Run ~ September 2010
Photo by Len Lichvar

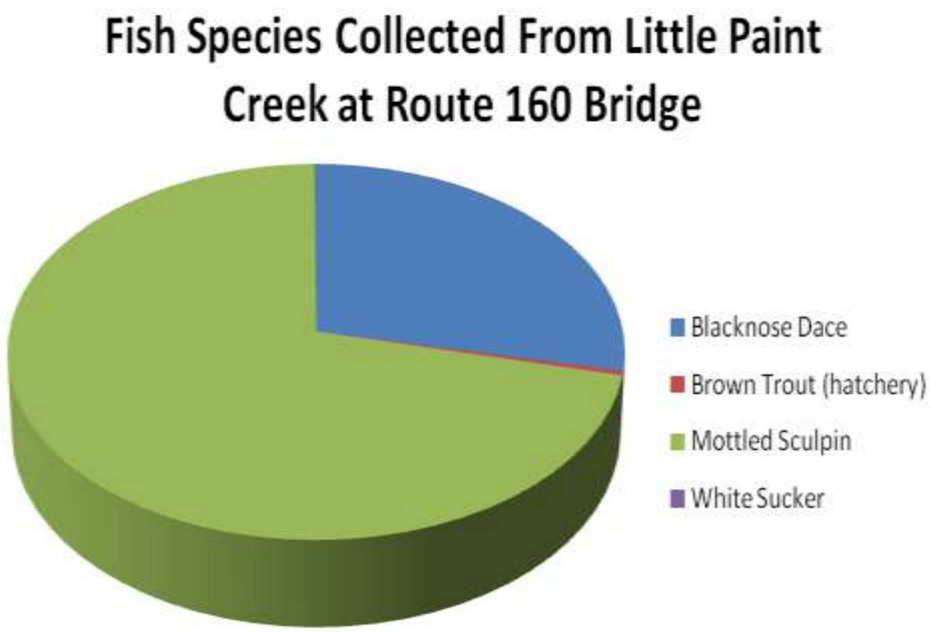


Figure 46.

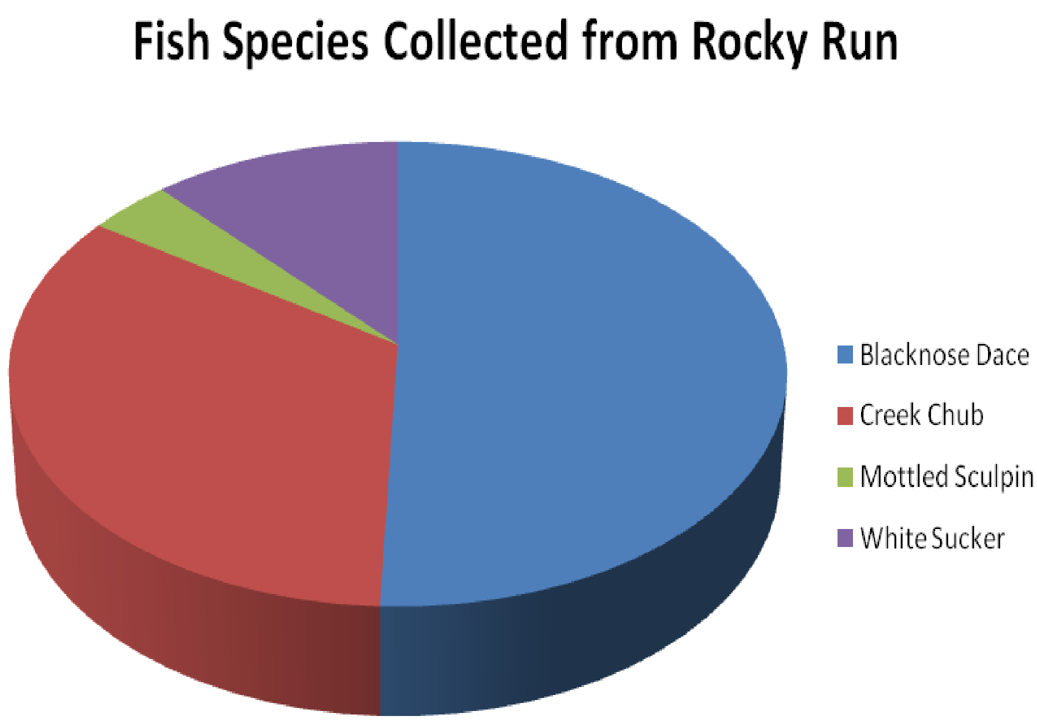


Figure 47.

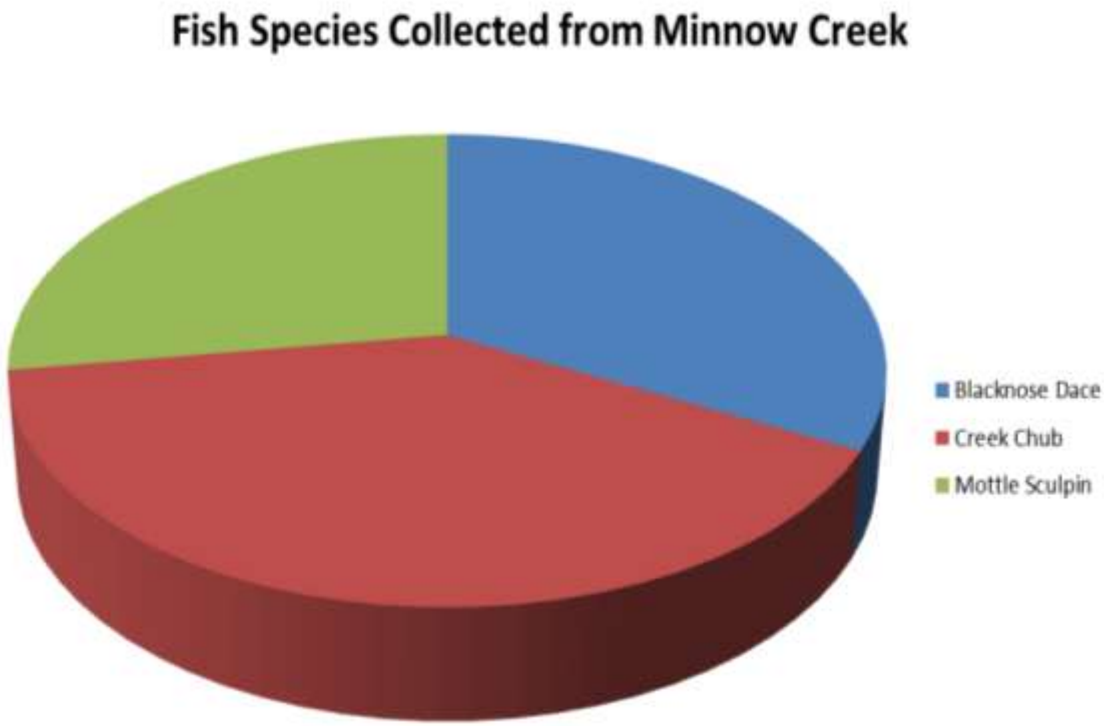


Figure 48.

Figure 49. Fish captured in the Little Paint Creek watershed.
Photo by Len Lichvar

The Little Paint Creek watershed is classified as a Coldwater Fishery by the Commonwealth of Pennsylvania. Biologically, the watershed adheres to this designation except for the mainstem of Little Paint Creek below the Elton Sportsmen's Dam. This section is dominated by warm and coolwater fish species. The macroinvertebrate community is also indicative of a cool to warmwater environment. While the macroinvertebrate community of this site signifies a warmer water environment, it is composed of primarily acid intolerant taxa, thereby signifying that the community is stable and indicates no pollutants except thermal (Barbour et al. 1999). The temperature increase of this area can be attributed to the main source of water for Little Paint Creek in this area originating from the spillway overflow of the Elton Sportsmen's Dam. This warm water is mixed with cold spring and tributary flow as the stream progresses.

Ponds at the Windber Country Club, upstream of the Elton Sportsmen's Dam also contribute to the warming of Little Paint Creek.

Tom Clark, the consultant who completed the *Paint Creek Restoration Plan* for PCRWA in 2005 used temperature loggers manufactured by Onset Computer Company to determine the impact of these man-made water impoundments. He installed one logger downstream of the Windber Country Club ponds and Elton Sportsmen's Dam and another at the mouth of Fox's Run for comparison. These loggers acquired data from July 1 - 15, 2005. Table 6 shows the average, minimum and maximum temperatures for these two sites. Data reveal that the maximum temperature of Little Paint Creek was more than eight degrees warmer than the maximum temperature of Fox's Run and only four degrees cooler than Fox's minimum temperature. The temperatures of Little Paint Creek in the stretch between the Elton Sportsmen's Dam and its confluence with Fox's Run are too warm for coldwater fish species to thrive. Ironically, this section is stocked with trout and is listed as Wild Trout Waters by PFBC (Clark 2005). Brown trout tolerate water temperatures up to 70 degrees, while brook trout will survive in temperatures below 65 degrees, though brook trout can tolerate higher temperatures if tapered into them.

	Little Paint Creek Below Impoundments	**Fox's Run Mouth**
Average Temperature	67.90 °F	62.52 °F
Minimum Temperature	62.79 °F	56.84 °F
Maximum Temperature	74.61 °F	66.58 °F

Table 6. Temperatures of Little Paint Creek below large water impoundments compared to Fox's Run, a forested tributary to Little Paint Creek.

When Little Paint Creek was sampled downstream at the State Route 160 Bridge, its fish and macroinvertebrate communities returned to coldwater / coolwater species. This site possessed hold over stocked brown trout. The macroinvertebrates were dominated by organic loading tolerant taxa, which is reflected in the organic loading metric by the elevated score. The organic components could stem from nutrient rich warm water input from the Elton dam and also from nutrient input from overland and tributary flow. The fish community at this site is dominated by mottled sculpin and blacknose dace (*R. atratulus*) indicating cold water with some organic loading.

Figure 50. Sedimentation in the headwaters of Little Paint Creek stifles aquatic life Photo by Melissa Reckner

The headwaters of Little Paint Creek (above the Windber Country Club) contain cold water, but are impacted by sedimentation. Sand and silt fill in most of the interstitial space of the bottom substrate creating an area non-conducive to trout spawning. The sedimentation impacts can be seen in the limited macroinvertebrate community and depressed fish community. The cause of this sedimentation appears to be the historic timbering of the area. While the forest is presently mature, a layer of sand has been exposed through historic timbering of the area. This sand is continuously deposited in the stream after high flow events.

Rocky Run is the most degraded of the Little Paint Creek tributaries. Even though its lower portion is forested and its physical habitat scores are high, its origins are located in an industrial area. The macroinvertebrate community fluctuates erratically and the fish community is limited to pollution tolerant species. The input of industrial runoff is the limiting factor to Rocky Run.

Fox's Run is the most pristine of the Little Paint Creek tributaries. Fox's Run has a reproducing population of wild brook trout and a macroinvertebrate community indicative of a healthy stream. The acid tolerant macroinvertebrate taxa outnumber the acid intolerant taxa due to the presence of tannic acid that is naturally present in the stream, acid deposition, and underlying geology that is a poor buffer. Tannic acid can limit biological communities; however, brook trout and other headwater species have evolved to be tolerant of these mild natural acids. Bait bucket introductions of nonnative species are evident in Fox's Run with the presence of the silverjaw minnow.

Minnow Creek is a small coldwater tributary to lower Little Paint Creek. Minnow Creek has a diverse pollution intolerant macroinvertebrate community but it is also impacted heavily by sedimentation. The sedimentation originates from overland flow from housing developments and historic timber cutting along the stream's headwaters.

The unnamed tributary at Dick's Auto has a macroinvertebrate community with very low diversity and total individuals. This stream receives sediment input from development, agricultural operations, and industrial pollution runoff from area businesses.

Visual Assessment

A visual assessment was conducted on the seven stream monitoring sites within the Little Paint Creek watershed utilizing the United States Environmental Protection Agency's Rapid Bioassessment Protocols (1999).

The unnamed tributary at Dick's Auto was the only stream surveyed that was given a poor score. This site had increased siltation, was downstream a state road, adjacent a lawn, and lacked a diverse habitat.

The mainstem of Little Paint Creek above the Windber Country Club and below the Elton Sportsmen's Dam and Rocky Run were rated fair. The channel condition of Little Paint Creek upstream of the Windber Country Club included braids, old meanders, and undercut banks, as well as large areas of sedimentation from historical and recent timbering. Sediment is a limiting factor to trout reproduction and community stability in this site. Little Paint Creek below the Elton Sportsmen's Dam had noticeable algal growth. This can be attributed to the increase in water temperature due to the Elton Sportsmen's Dam upstream. Rocky Run's water appearance was slightly turbid and green, with algae present. Its canopy cover, riparian zone, substrate, and lack of fish barriers make it suitable trout habitat, although Rocky Run's water chemistry negates that.

Little Paint Creek at State Route 160, Fox's Run, and Minnow Creek all received a good rating. While the canopy was more open at this site on Little Paint Creek, it had at least five types of habitat available for macroinvertebrates and six different in-stream covers for fish. Its channel was natural and allowed for fish passage. There were some algae growing here. Fox's Run also had at least five types of habitat available for macroinvertebrates and seven in-stream fish cover types. There was little algae growth present and the water was a little tea-colored, likely from the surrounding hemlocks. Over 75 percent of the stream was shaded within sight of the monitoring location. Minnow Creek also had at least five habitat types for macroinvertebrates and six in-stream habitat covers for fish. In Minnow Creek, seasonal low water could impede fish passage. There were eroding stream banks in this stream reach. Timbering operations in 2011 opened the canopy in areas of Minnow Creek and disturbed soils, which can contribute to sedimentation.

Visual assessment scores for all sites may be found in Appendix 5.

Invasive Species

Invasive species were not specifically assessed for the creation of this plan; however, some common invasive plant species were identified in the field in 2010 and

2011. These included Japanese knotweed, especially in the lower end of the watershed and purple loosestrife.

Figure 51. Japanese knotweed
Photo by Melissa Reckner

While the Commonwealth of Pennsylvania does not recognize Japanese knotweed (*Fallopia japonica*) as a noxious weed, it still threatens ecosystems throughout western Pennsylvania. Japanese knotweed is a bamboo-like plant that thrives in disturbed open areas. It spreads by seed or roots and forms a dense stand of vegetation that crowds out everything below (Natural Biodiversity 2011).

Japanese knotweed, or "knotweed" for short, was introduced to the United States in the late 1800s from Japan for bank stabilization and erosion control. The plant is tolerant of a wide range of soil types and can live in wet or dry areas, but is intolerant of shade. Riparian areas along stream banks are the most at risk of invasion because the plant is tolerant of flooding and can easily overtake shorelines (Natural Biodiversity 2011).

Purple loosestrife is native to Europe and Asia and introduced to the United States in the 1800s for ornamental and medicinal uses. While the magenta-colored flowers are lovely, a mature plant can produce millions of seeds, viable for as long as 20 years, and spread through rhizomes, thereby taking over wetland areas, reducing stands of native species, and diminishing habitat of waterfowl (Natural Biodiversity 2011).

Through education and identification, these species can be managed to keep the spread of the species to a minimum. It is important to educate the public about the dangers of purposely introducing non-native plant species, the benefits of planting native species, and the need to research plant species before planting or transplanting.

Wildlife

The Indiana bat (*Myotis sodalis*) is an endangered species protected by the Pennsylvania Game Commission (PGC). It is found in low numbers across eastern United States. The Indiana bat closely resembles the common little brown bat and they often hibernate together. Hibernacula are found in areas with well-developed limestone caverns and abandoned mines. Their hibernation sites must have noticeable airflow and the lowest non-freezing temperature possible. Sites often have some flowing or standing water too. Many Indiana bats will roost in trees. Females will gather under loose bark, which serve as maternity sites in the summer. The PGC found that, "their primary insect-foraging habitat was on gentle to moderate south-facing slopes covered by mixed oak or mixed northern hardwood forests." The PGC has confirmed summer live captures and winter hibernacula in Somerset County, which borders the Little Paint Creek watershed. Loss of habitat, mine collapses, traffic, windmills, and White Nose Syndrome threaten Indiana bats (Butchkoski 2010).

The small-footed bat (*Myotis leibii*) is a threatened species in Pennsylvania, though nationally, it has no special protection. The PGC has found these bats in the summer and winter in Somerset County. These bats usually roost individually, not in colonies, hibernating in caves and mines, under large rocks and in tight crevices. It flies slowly and erratically, often one to three feet above the ground, suggesting it may not be affected by windmills. More data are needed on its behavior and population (Butchkoski 2010).

The short-eared owl (*Asio flammeus*) is an endangered species protected by the PGC. Pennsylvania is the southern edge of their North American breeding range, and nests have been identified in Cambria County. Short-eared owl nests are in the ground, often at the base of a clump of grass. These owls prey primarily on meadow mice, making large open, fields, airports, and reclaimed striped mines attractive to this species. Disturbance-free nesting sites and loss of habitat threaten short-eared owls (Haffner et al. 2009).

The West Virginia water shrew (*Sorex palustris punctulatus)* is a threatened species protected by the PGC. In Pennsylvania, they are only found on the Allegheny Plateau, including portions of Cambria and Somerset Counties. The West Virginia water shrew is the second largest shrew in the state at six inches from nose to tail tip. They are a semi-aquatic shrew and have slightly webbed hind feet to help them swim. They can stay underwater for more than 45 seconds. West Virginia water shrew prefers high elevation, mountain streams of high water quality, moderate flow, and deeply undercut banks. Changes in water quality and temperature, forest fragmentation, and sedimentation threaten these shrews. Nationally, the species is considered secure (Butchkoski 2010).

Figure 52.
West Virginia water shrew
Photo by Ken Cantania for PGC.

Ospreys (*Pandion haliaetus*) are a threatened species in Pennsylvania, but nationally, they are not listed as threatened nor endangered. They are a large bird of prey that feed almost exclusively on fish, earning them the name "fish hawk." They nest near large bodies of water. Once listed as extirpated in Pennsylvania, osprey populations are rising. The PGC identifies Somerset County as a nesting county for osprey (Gross 2009).

Pennsylvania Natural Heritage Program

The Pennsylvania County Natural Heritage Inventory for Cambria County indicates that the Little Paint Creek watershed is adjacent a provisional species of concern site. As defined by the PNHP website, provision species of concern sites, "represent one or more species occurrences found outside of existing core habitat areas. These areas are in the process of being evaluated and drawn based on species habitat requirements." The Important Bird Area Number 84, the Allegheny Front, extends into the eastern most portion of the Little Paint Creek watershed. This site provides essential habitat for one or more species of bird and is important for conserving the diversity and abundance of birds (Pennsylvania Natural Heritage Program 2011).

PNDI

A Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review of the watershed on September 7, 2011 yielded no concerns.

Figure 53. The remains of a round structure along Little Paint Creek said to float coal and separate it from rock. Photo by Melissa Reckner

Erosion and Sedimentation

Erosion can be a natural source of sedimentation in a stream, but human activities are often the cause of this erosion. While it often appears natural, stream bank erosion can be caused by people's removal of stream bank vegetation or increased runoff from impervious surfaces like parking lots and roadways. Native vegetation is critical to the health of waterways. Not only do native plants provide food and cover for a variety of terrestrial and aquatic species, they stabilize the soil, slow water infiltration, filter runoff, and can withstand local climate and natural events better than introduced species. Impervious surfaces disrupt the natural infiltration of water. They allow water to enter waterways at a faster rate and in higher volumes, which carves deeper ruts in stream banks and increases sedimentation.

Poorly designed or maintained dirt and gravel roads can contribute sediment to waterways.

Poor agricultural practices can also contribute to erosion and sedimentation. Poorly maintained or reduced riparian buffer zones, as well as livestock's open access to streams can decrease soil stability and increase sedimentation.

Permitting

There are several businesses and industries operating within the Little Paint Creek watershed that utilize chemicals that could be harmful to the environment. Permitted and illegal discharges, as well as runoff and spills, are a concern for the health of waterways in the watershed. Compliance with state and local regulations is necessary to protect streams from elevated and harmful levels of these chemicals.

Illegal Dump Sites

As of April 2010, Keep Pennsylvania Beautiful documented 203 illegal dumpsites in Cambria County. Of these, five sites are located within the Little Paint Creek watershed (Figure 54). Keep Pennsylvania Beautiful estimates that these five sites together have over six tons of trash, including more than 65 tires, two small propane cylinders, two televisions, and carpeting, clothing, recyclables, vehicle parts, and other household trash.

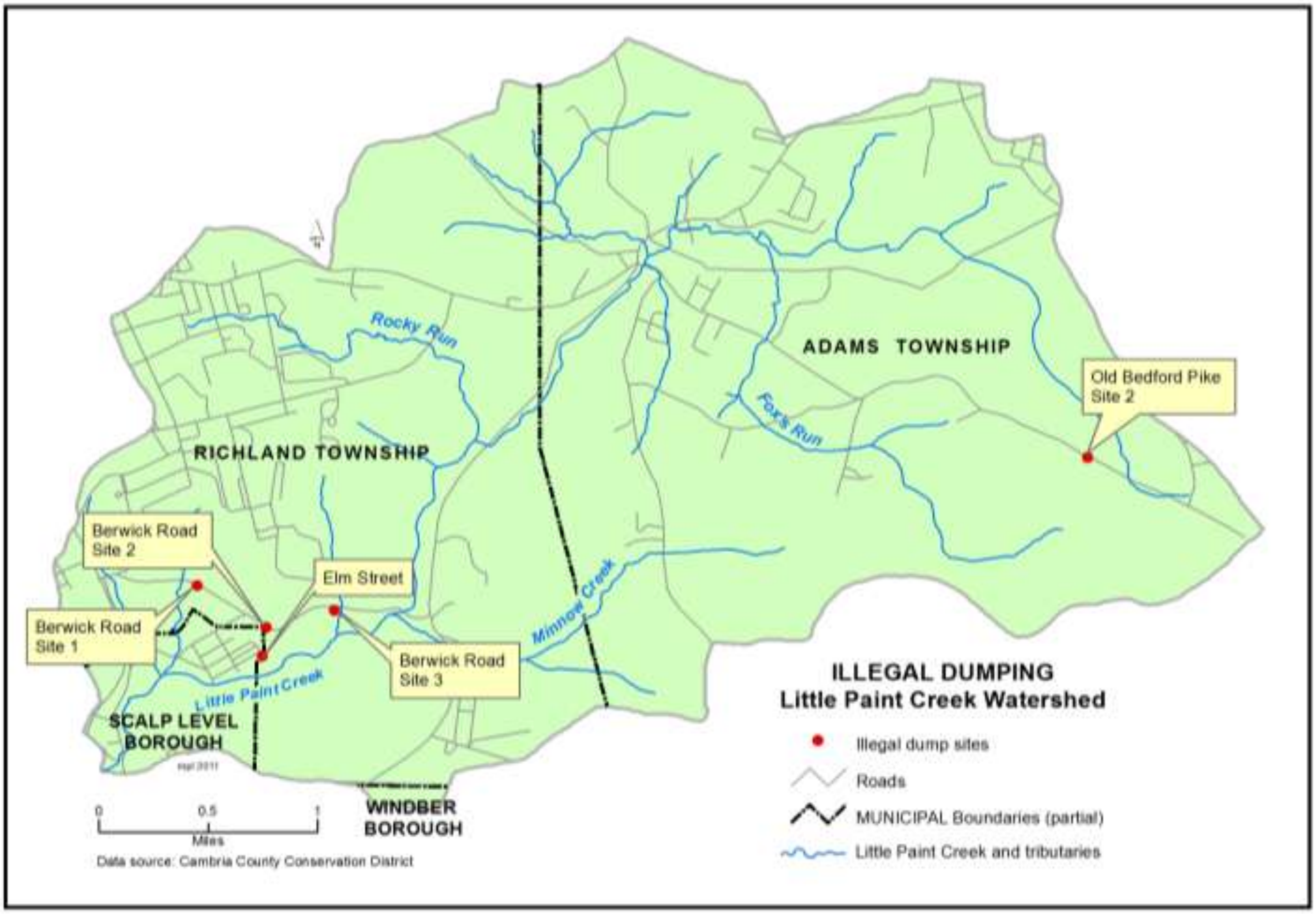


Figure 54. Illegal dump sites in the Little Paint Creek watershed

Litter along roadways and streams continue to be a problem, especially by the Richland Towne Centre shopping complex.

Figure 55. Plastic shopping bags snag in brush near the Richland Towne Centre shopping complex Photo by Melissa Reckner

Acidification

The acidic nature of several soil types in the Little Paint Creek watershed, as well as acid deposition from increased levels of Nitrogen Oxides (NOx) and Sulfur Dioxide (SO_2) in the atmosphere might negatively affect water quality.

The United States Environmental Protection Agency (EPA) classified Cambria County as "Nonattainment" in the years 2005-2011 for Particulate Matter (PM-2.5) related to 1997 National Ambient Air Quality Standard Designations and Classifications and in years 2009-2011 for PM-2.5 related to 2006 National Ambient Air Quality Standard Designations and Classifications (EPA 2011). The EPA defines particulate matter as, "a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles," (EPA 2011). Particles 2.5 micrometers or smaller are called "fine particles." They are found in smoke and haze and can form from chemical reactions between air and gasses emitted from power plants, vehicles, and industry. They reduce visibility and can cause serious health problems by getting deep into one's lungs.

Thermal Pollution

Runoff from impervious surfaces or industrial discharges could warm waterways and stress aquatic species. Some species have a narrow thermal range in which they can survive and flourish.

The destruction of riparian zones can open the canopy, exposing streams to sunlight, which can warm waters, increase algal growth and deplete dissolved oxygen.

Warm water from the Elton Sportsmen's Dam and Windber Country Club Ponds is impacting the cold water taxa in Little Paint Creek.

Stream Obstructions

The Cambria County Geographic Information System Center provided coordinates of potentially significant stream obstructions greater than two feet (Figure 56). These obstructions could hinder fish passage.

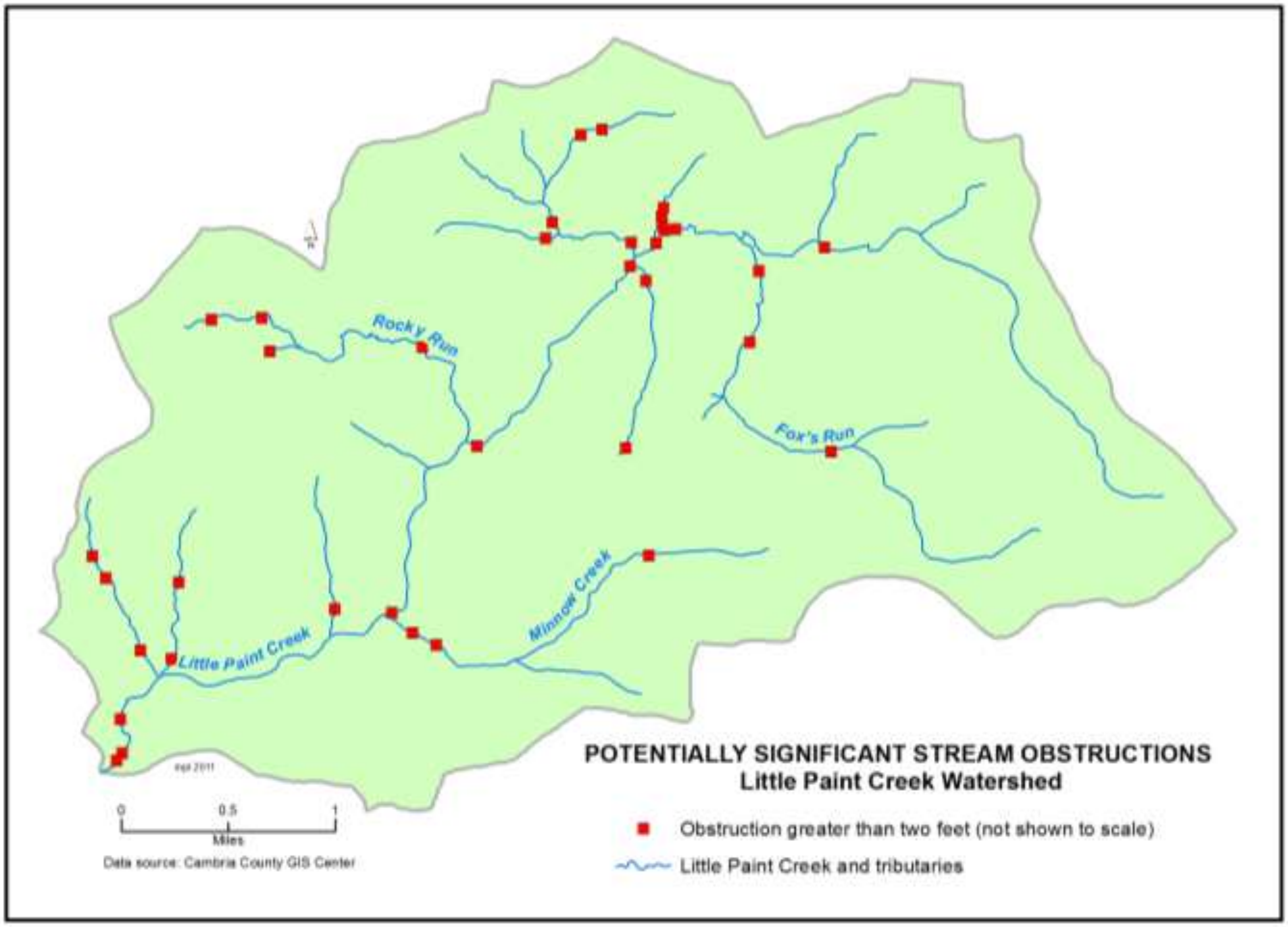


Figure 56.

Non-attaining Streams

The Pennsylvania Department of Environmental Protection (DEP) has an approved TMDL – Total Maximum Daily Load – for Little Paint Creek, caused by metals, citing bank modifications 1.55 miles from the mouth. This is the Mine 40 boney pile.

Rocky Run is listed in DEP's 2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report as a waterbody impaired by "petroleum activities, oil and grease" expected to meet uses in a reasonable time frame. It was listed in 2004 (PA DEP 2008). The source of this impairment needs identified and rectified.

Littering

The Little Paint Creek watershed benefits from the protection and care of several conservation groups including, but not limited to the Paint Creek Regional Watershed Association (PCRWA), Windber Sportsmen's Club, Conemaugh Valley Conservancy, Mountain Laurel Trout Unlimited (MLTU), and Cambria County Conservation District.

Every spring, the Conemaugh Valley Conservancy's Kiski-Conemaugh Stream Team works with PCRWA to organize a litter cleanup from along Berwick Road and a portion of Little Paint Creek. In 2011, 24 volunteers from the Stream Team, PCRWA, MLTU, Saint Francis University, and University of Pittsburgh at Johnstown's Geography Club picked up nearly 1 ton of trash and 39 tires (down from 148 tires the year before) in conjunction with the Great American Cleanup of Pennsylvania. Volunteers also removed two couches, a stretcher, an old safe that was turned over to the police, car parts, and the usual bottles and Styrofoam in 2011.

For many years, until 2009, a couple of fraternities at the University of Pittsburgh at Johnstown (UPJ) conducted a semi-annual cleanup of two miles of State Route 160, adjacent Little Paint Creek. The UPJ campus lies within the Little Paint Creek watershed. It is the largest regional campus of the University of Pittsburgh and is described as an "Extraordinarily picturesque campus featuring a pristine nature preserve with scenic hiking trails," (University of Pittsburgh 2011). Much of its 655 acres is undeveloped and forested. In fact, a portion of the campus is listed as a Wilderness Preserve for ecological and scientific study and research by Pitt students and faculty.

In 2011, PCRWA agreed to adopt a two-mile section of State Route 160, adjacent Little Paint Creek.

Figure 57. A UPJ student removes tires from along Berwick Road
Photo by Melissa Reckner

Figure 58. A UPJ student removes a bag of garbage from a posted, yet popular illegal dumpsite
Photo by Melissa Reckner

New classification for Fox's Run

The majority of the Little Paint Creek watershed flows through various anthropomorphic impacts, from urbanized industrial impacts to impoundments. While this stream has impacts, it still maintains cold water in most of its watershed. Fox's Run, however, appears to be the last refuge for wild brook trout in the watershed. PCRWA and partners should advocate for its designation as a High Quality stream through the DEP.

* As a result of its survey of Fox's Run during this project, the Pennsylvania Fish and Boat Commission listed Fox's Run (UNT 45242) as a Wild Trout Water in 2011.

Maintain Fox's Run Water Quality

Past logging and current housing development contribute sediment to Fox's Run. This needs to be controlled. PCRWA should partner with the Mountain Laurel chapter of Trout Unlimited and others to stabilize stream banks and improve fish habitat.

Maintain Trout Fishery on Little Paint Creek mainstem

The mainstem of Little Paint Creek should be maintained as a stocked trout fishery for the recreational value it provides to anglers.

Control Erosion and Sedimentation

Sedimentation from erosion and runoff is degrading aquatic habitat in Little Paint Creek and its tributaries. PCRWA should work to improve dirt and gravel roads in partnership with Adams and Richland Townships and the Cambria County Conservation District's Dirt and Gravel Road Program. Parties also need to ensure healthy, riparian buffer zones are in place. If necessary, partners should educate farmers on best management practices to reduce soil compaction and loss. Regular inspections at housing developments, like Centennial Woods, are necessary. Stormwater runoff needs to be reduced.

Figure 59. Sediment flows into Elton Sportsmen's Dam from its parking lot during a rain event
Photo by Melissa Reckner

Remove Elton Sportsmen's Dam

The *Paint Creek Restoration Plan* and PFBC *Elton Sportsmen's Dam (818E) Management Report* indicate that the Elton Sportsmen's Dam has little warmwater fishing recreation value due to low numbers of fish and the slow growth of fish. Partners and the landowner should discuss the removal of this impoundment, which would reduce thermal pollution and possibly lengthen the wild trout sections of Little Paint Creek. Full restoration and sediment removal at this site would be necessary if the dam were removed. Because of the access, it would make an ideal fishing area for handicapped people and children.

American Rivers, a national non-profit conservation organization working to protect and restore the nation's rivers and streams, has identified the Elton Sportsmen's Dam as a dam removal candidate. American Rivers noted that, in 2006, the Pennsylvania Department of Environmental Protection requested immediate repairs to this earthen dam that was built in 1956. According to American Rivers, design and construction for removal of this dam would cost approximately $80,000 (Hollingsworth-Segedy 2011).

Lessen thermal impacts of Windber Country Club ponds

There are three ponds on the Windber Country Club grounds that feed warm water to Little Paint Creek. PCRWA and partners should work with the club to install longer, deeper underground overflow pipes to cool discharge water using ambient ground temperature to lessen the thermal impacts from these ponds.

Figure 60. A fountain at a Windber Country Club pond
Photo by Melissa Reckner

Stormwater Management

In compliance with Pennsylvania Stormwater Management Act 167, the Cambria County Conservation District oversaw the completion of the *Stonycreek River Watershed Stormwater Management Plan*. This plan was developed "to control stormwater runoff from new development on a watershed-wide basis rather than on a site-by-site basis" (CCCD 2005). It helps with modeling and set standards and criteria for stormwater control. All municipalities within the Stonycreek River Watershed were required to adopt this plan.

Investigate Pollution Source(s) on Rocky Run

Rocky Run is listed on the DEP's Integrated List for non-attainment because of petroleum, grease, and oil, which likely stem from industry, business, and stormwater runoff from parking lots and roads in Richland Township. PCRWA and partners should investigate these sources with more detailed chemical analysis, particularly for surfactants and petroleum products. Then, they need to work with business leaders, municipalities, and regulatory agencies to implement best management practices and reduce the amount of contaminants entering Rocky Run.

The benthic macroinvertebrate community of Little Paint Creek below the confluence of Rocky Run will be assessed in 2012 to determine the extent of Rocky Run's impacts to the mainstem.

Remove Illegal Dumps and Conduct Litter Cleanups

Keep Pennsylvania Beautiful has identified several illegal dump sites throughout the Little Paint Creek watershed. PCRWA and its partners are aware of several of these sites. In fact, PCRWA and the Kiski-Conemaugh Stream Team organize an annual cleanup along Berwick Road and lower Little Paint Creek. These must continue and groups should remove trash at other sites in cooperation with Keep Pennsylvania Beautiful, the Pennsylvania Department of Transportation, municipalities, and private landowners. A group should adopt a portion of State Route 160, a highly visible road that dissects the Little Paint Creek watershed. Placement of signage and even cameras should be considered at the worst sites.

Remediate the Jandy Discharge

The Jandy Abandoned Mine Discharge, identified as LPC-D01 in the *Paint Creek Restoration Plan*, should be remediated. PCRWA received a DEP Growing Greener grant in 2003 to study this discharge and design a treatment method for it, which bid winner, GAI Consultants, did. With DEP's approval of the treatment method, PCRWA should seek funds to implement the study's recommendations. Water infiltrating the adjacent bony pile is the primary source of this discharge.

Reclaim Mine 40 Coal Refuse Pile

Greenley Energy Holdings of PA, Inc. owns the Mine 40 coal refuse pile. This pile is viewed as three sections, A – C. Sections A and C have been removed and reclaimed. Section B should be removed as soon as possible as it is the largest AMD impact on Little Paint Creek. PCRWA, Greenley Energy, Ebensburg Power Company and the DEP should have a meeting to discuss expediting the removal and reclamation of this site. This, coupled with the remediation of the Jandy discharge, could add 1.5 miles of fishery to Little Paint Creek (Clark 2005).

Stream Obstructions

There are three dozen documented stream obstructions greater than two feet in the Little Paint Creek watershed. The condition of these obstructions needs investigated. PCRWA and partners need to ensure fish passage is not hindered by these obstructions.

Restore native habitat

While invasive species are not prevalent in the Little Paint Creek watershed, those that are should be removed for native species to flourish and care must be taken to prevent spread of invasive species. The purple loosestrife in a moist field along SR 756 could be pulled before it seeds and knotweed in the lower end of the watershed could be cut with loppers in the summer and again in the fall. Stream banks should be enhanced through the planting of native trees to provide shade and bank stabilization to improve water quality and offer habitat for terrestrial species.

Public education

PCRWA and its partners need to educate and engage the public on environmental topics like the benefits of native plants, the threats aquatic invasive species pose, the need for healthy, wide riparian zones, the proper use of pesticides, sustainable living, energy conservation, stormwater management, and most importantly, the benefits of clean, cold water.

Watershed Goals, Tasks and Potential Partners

Goal 1: New classification of Fox's Run		
Milestones		*Possible Partners*
Task 1	Review DEP's EV and HQ and PFBC's Wild Trout Waters classification stipulations	PCRWA, CVC, CCCD
Task 2	Acquire additional data if needed	PA DEP, PFBC
Task 3	Petition for appropriate classification of Fox's Run – UNT 45242	PCRWA, CVC, CCCD, WSC

Goal 2: Maintain Fox's Run water quality		
Milestones		*Possible Partners*
Task 1	Review stream bank restoration potential with partners	PCRWA, CCCD, WPC
Task 2	Educate adjacent landowners on stream friendly landscaping	PCRWA, NB, LWV—WREN
Task 3	Streambank fencing	NRCS

Goal 3: Maintain trout fishery on Little Paint Creek mainstem		
Milestones		*Possible Partners*
Task 1	Continue to monitor temperatures of Little Paint Creek above and below the Windber Country Club ponds and the Elton Sportsmen's Dam	PCRWA, CVC, landowners, WSC
Task 2	Conduct streambank restoration	MLTU, WSC
Task 3	Install habitat structures	MLTU, WSC, CCCD

Goal 4: Control erosion and sedimentation		
Milestones		*Possible Partners*
Task 1	Improve Dirt and Gravel Roads	CCCD, Municipalities
Task 2	Maintain healthy riparian buffer strips	CCCD, PCRWA
Task 3	Ensure farmers are utilizing best management practices	CCCD, NRCS, WPC
Task 4	Educate landowners and municipalities on the principals of environmentally sensitive road maintenance techniques	LWV, PCRWA, CCCD
Task 5	Regularly inspect construction projects	CCCD, PA DEP

Goal 5: Remove Elton Sportsmen's Dam		
Milestones		*Possible Partners*
Task 1	Conduct a SWOT analysis of the dam removal	PFBC, PA DEP
Task 2	Maintain open communications with adjacent landowners	PFBC, PA DEP, PCRWA, landowners, CCCD
Task 3	Remove the dam	PFBC, PA DEP, American Rivers
Task 4	Restore the area	PFBC, PCRWA, CCCD, UPJ, NB
Task 5	Study the chemical and biological and anthropological impacts	PFBC, UPJ

Goal 6: Lessen thermal impacts of Windber Country Club ponds		
Milestones		*Possible Partners*
Task 1	Evaluate extent of thermal impacts from ponds	CVC, SFU, PFBC, PCRWA
Task 2	Evaluate the efficacy of installing deeper longer overflow pipes	CVC, SFU, PCRWA
Task 3	Install overflow pipes that will use ambient ground temperature to cool discharge water from the ponds	CVC, SFU, PCRWA, WCC

Goal 7: Stormwater Management		
Milestones		*Possible Partners*
Task 1	Evaluate existing stormwater controls	Municipalities
Task 2	Implement stormwater management plans	Municipalities, CCCD
Task 3	Educate residents on BMPs (i.e. Rain barrels, rain gardens, etc.)	CCCD
Task 4	Encourage residents to use the CCCD's Stormwater Management Procedures for Small Projects self help guide	CCCD, PCRWA

Goal 8: Investigate Pollution Sources on Rocky Run		
Milestones		*Possible Partners*
Task 1	Monitor long-term trends	SFU
Task 2	Investigate chemical components during high and low flow with grab sampling	CVC, SFU
Task 3	Ensure NPDES permits are in place	CCCD
Task 4	Address concerns to regulatory agencies	PCRWA

Goal 9: Remove Illegal Dumps and Conduct Litter Cleanups		
Milestones		*Possible Partners*
Task 1	Remove known illegal dump sites	PCRWA, KPB, MLTU, municipalities
Task 2	Conduct annual road and stream-side clean-ups	PCRWA, CVC, MLTU, UPJ, SFU, PennDOT, residents
Task 3	Monitor sites and install signage	Landowners, residents

Goal 10: Remediate the Jandy Discharge		
Milestones		*Possible Partners*
Task 1	Review proposed treatment design with all partners. Adjust if necessary	PCRWA, PA DEP, NRCS, PACD, Greenley
Task 2	Secure funding for treatment system construction	PCRWA
Task 3	Monitor treatment system's impacts	CVC, PA DEP

Goal 11. Reclaim Mine 40 Coal Refuse Pile		
Milestones		*Possible Partners*
Task 1	Discuss the removal and reclamation timetable	PCRWA, PA DEP, Greenley, Ebensburg Power
Task 2	Petition legislative support for expedited removal of the refuse	PCRWA, SCRIP

Goal 12. Stream Obstructions		
Milestones		*Possible Partners*
Task 1	Inspect the condition of obstructions	PCRWA, CVC, MLTU, PFBC, CCCD
Task 2	Remove obstructions hindering fish passage and replace with appropriate mechanisms, like bottomless culverts	Municipalities, MLTU, PFBC

Goal 13. Restore native habitat		
Milestones		*Possible Partners*
Task 1	Survey extent of invasive species	NB
Task 2	Remove invasive species	PCRWA, NB, landowners
Task 3	Plant native species	NB, CCCD, landowners, UPJ

Goal 14: Public education		
Milestones		*Possible Partners*
Task 1	Conduct awareness programs	PCRWA, CVC, CCCD
Task 2	Recruit volunteers and members	PCRWA

Key to Acronyms	
CCCD	Cambria County Conservation District
CVC	Conemaugh Valley Conservancy
KPB	Keep Pennsylvania Beautiful
LWV	League of Women Voters
MLTU	Mountain Laurel Trout Unlimited
NB	Natural Biodiversity
NRCS	Natural Resource Conservation Service
PACD	Pennsylvania Association of Conservation Districts
PA DEP	Pennsylvania Department of Environmental Protection
PCRWA	Paint Creek Regional Watershed Association
PFBC	Pennsylvania Fish and Boat Commission
SCRIP	Stonycreek Conemaugh River Improvement Project
SFU	Saint Francis University
UPJ	University of Pittsburgh at Johnstown
WCC	Windber Country Club
WPC	Western Pennsylvania Conservancy
WSC	Windber Sportsmen's Club

Conclusions

Even though the Little Paint Creek watershed is influenced by industrial and recreational impacts, coldwater resources are still present in this watershed. Fox's Run is the only tributary that currently contains a sustainable wild brook trout population, but the stocked trout portion of the watershed could be extended. The removal of the Elton Sportsmen's Dam and thermal reclamation of the Windber Country Club ponds could double the length of recreational trout fishery in the watershed. Remediation of the Jandy Abandoned Mine Discharge and reclamation of the Mine 40 coal refuse pile could also extend the fishery. The Paint Creek Regional Watershed Association and its many partners need to educate businesses and landowners about collaborative ways to protect and enhance Little Paint Creek and its beautiful tributaries.

Works Cited

Barkley, Chris. Personal Interview. 15 July 2011.

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J. B. Stribling. *Rapid Bioassessment Protocols For Use In Wadeable Streams and Rivers: Periphyton, Benthic Macroinvertebrates and Fish, second edition*. United States Environmental Protection Agency, Office of Water. Washington, D.C., 1999.

Bureau of Topographic and Geologic Survey. *Geology of Pennsylvania*. Pennsylvania Department of Conservation and Natural Resources. 2011. Web. 7 September 2011.

Butchkoski, Eileen. *Indiana Bat.* Pennsylvania Game Commission. 10 February 2010. Web. 30 July 2011.

Butchkoski, Eileen. *Small-footed Bat.* Pennsylvania Game Commission. 15 January 2011. Web. 30 July 2011.

Butchkoski, Eileen. *West Virginia Water Shrew.* Pennsylvania Game Commission. 19 January 2010. Web. 30 July 2011.

Cambria County Conservation District. *Stonycreek River Watershed Act 167 – Phase 2 Stormwater Management Plan*. 2005.

Clark, Thomas J. *Paint Creek Restoration Plan.* 2005.

Deal, Amanda, Eric Null, and Leonard Lichvar. *Stonycreek River Watershed Reassessment.* Somerset, PA. May 2008.

Farley, Dr. William H. *Soil Survey of Cambria County, Pennsylvania.* United States Department of Agriculture, Soil Conservation Service. 1985.

Frens and Frens, LLC. *Physical Assessment and Feasibility Study of the Eureka Mine 40 Historic Coal Mine Site.* 1992.

Fry Communications, Inc. *The Pennsylvania Code*. Title 25, Chapter 93. Commonwealth of Pennsylvania. 8 October 2011. Web. 9 September 2011.

Gross, Doug. *Osprey*. Pennsylvania Game Commission. 28 August 2009. Web. 30 July 2011.

Haffner, Cathy and Doug Gross. *Short-eared Owl.* Pennsylvania Game Commission. 13 November 2009. Web. 30 July 2011.

Hollingsworth-Segedy, Lisa. *Preliminary Dam Removal Candidate Projects, Conemaugh Watershed*. American Rivers. 2011.

Natural Biodiversity. *BioBullies Invasive Species Information Sheets.* Web. 16 June 2011.

Penn State Marcellus Center for Outreach and Research. *Maps and Graphics.* Pennsylvania State University. University Park, Pennsylvania. 2010. Web. 8 September 2011.

Pennsylvania Department of Environmental Protection. *Instream Comprehensive Evaluation Surveys.* 19 March 2009. Web. 12 November 2011.

Pennsylvania Department of Environmental Protection. *Marcellus Shale.* 2011. Web. 4 November 2011.

Pennsylvania Department of Environmental Protection. *2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 4b Waterbodies, Expected to Meet Uses in Reasonable Time Frame.* 2008. Web. 12 October 2011.

Pennsylvania Department of Transportation. *Traffic Volume Map Cambria County Pennsylvania.* January 2011. Web. 15 October 2011.

Pennsylvania Natural Heritage Program. *Statewide County Natural Heritage Inventory Map.* Web. 7 September 2011.

United States Census Bureau. *Pennsylvania 2000.* United States Department of Commerce. September 2003. Web. 10 September 2011.

United States Environmental Protection Agency. *Nonattainment Status for Each County by Year for Pennsylvania*. 30 August 2011. Web. 22 September 2011.

United States Environmental Protection Agency. *Particulate Matter*. 6 July 2011. Web. 22 September 2011.

United States Geological Survey. *USGS Releases New Assessment of Gas Resources in the Marcellus Shale, Appalachian Basin.* United States Department of Interior. 23 August 2011. Web. 4 October 2011.

University of Pittsburgh at Johnstown. *Employment at the University of Pittsburgh at Johnstown.* University of Pittsburgh. 2008. Web. 17 July 2011.

Windber Coal Heritage Center. *History*. 2011. Web. 28 July 2011.

Wisniewski, Jason, Rick Lorson, and Gary Smith. *Elton Sportsmen's Dam (818E) Management Report.* Pennsylvania Fish and Boat Commission, Bureau of Fisheries, Fisheries Management Division, Area 8. Somerset, PA. January 2001.

Appendix 1

Little Paint Creek Monitoring Site Locations

SITE		LATITUDE	LONGITUDE	ACCURACY	METHOD
Little Paint Creek at Windber Country Club					
	Downstream	40° 16' 58.1" N	78° 46' 28.2" W	21 feet	GPS
	Middle	40° 16' 56.8" N	78° 46' 23.6" W	27 feet	GPS
	Upstream	40° 16' 55.2" N	78° 46' 23.7" W	31 feet	GPS
Little Paint Creek below Elton Sportsmen's Dam (PFBC historical site)					
	Downstream	40° 16' 51.8" N	78° 47' 25.7" W	41 feet	GPS
	Middle	40° 16' 51.9" N	78° 47' 22.2" W	34 feet	GPS
	Upstream	40° 16' 50.1" N	78° 47' 18.0" W	38 feet	GPS
UNT at Dick's Auto					
	Single point	40° 16' 52.4" N	78° 48' 6.2" W	24 feet	GPS
Fox's Run (UNT 45242)					
	Downstream	40° 16' 34.0" N	78° 47' 25.0" W	59 feet	GPS
	Middle				
	Upstream	40° 16' 33.3" N	78° 47' 27.5" W	72 feet	GPS
Little Paint Creek at Route 160 pull-off (PFBC historical site)					
	Downstream	40° 16' 4.0" N	78° 48' 55.3" W	46 feet	GPS
	Middle	40° 16' 6.6" N	78° 48' 51.0" W	28 feet	GPS
	Upstream	40° 16' 7.2" N	78° 48' 48.4" W	36 feet	GPS
Rocky Run (UNT 45234)					
	Downstream	40° 16' 5.5" N	78° 48' 59.6" W	31 feet	GPS
	Middle	40° 16' 7.8" N	78° 48' 57.6" W	24 feet	GPS
	Upstream	40° 16' 11.5" N	78° 49' 0.1" W	27 feet	GPS
Minnow Creek					
	Downstream	40° 15' 10.5" N	78° 49' 1.3" W	50 feet	GPS
	Middle	40° 15' 9.0" N	78° 48' 57.0" W	25 feet	GPS
	Upstream	40° 15' 10.4" N	78° 48' 53.8" W	32 feet	GPS

Appendix 2 – Water Chemistry

Water Chemistry Data for Little Paint Creek and Tributaries
September 22, 2010

Site Name	Water Temp (ºC)	pH	Sp. Conductance (uS/cm)	Total Alkalinity (mg/L $CaCO_3$)	Total Hardness (mg/L $CaCO_3$)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Phosphate (mg/L)	Salinity (ppt)
Little Paint above Windber Country Club	15.0	6.8	42.2	16	28	9.6	21	<0.2	<0.2	
Little Paint below Elton Sportsman's Dam	16.5	7.5	169.0	55	20	7.2	86	<0.2	<0.2	
Unnamed Tributary by Dick's Auto	15.5	7.5	368.0	52	100	8.4	208	<0.2	<0.2	0.2
Fox's Run	14.5	6.7	36.0	8	40	8.6	16	<0.2	<0.2	
Little Paint at Rt. 160 pull-off	13.8	7.4	230.0	65	100	8.8	110	<0.2	<0.2	
Rocky Run	15.3	8.12	621.0	105	188	9.2	306	<0.2	<0.2	0.3
Minnow Creek	16.3	7.95	198.6	72	88	6.9	100	<0.2	<0.2	

Notes: Warm and humid, high in low 80s. Dry. No rain in over a week and then only one day.

Data collected by:

Melissa Reckner, Kiski-Conemaugh Stream Team
Eric Null, Somerset Conservation District
Josh Penatzer, Somerset Conservation District

Hanna Combo Meter: TDS
YSI Meter: Water Temp., pH, Cond., Salinity
LaMotte Limnology Kit: Alkalinity, Hardness, D.O., N, P

Water Chemistry Data for Little Paint Creek and Tributaries
May 17, 2011

Site Name	Water Temp (ºC)	pH	Sp. Conductance (uS/cm)	Total Alkalinity (mg/L $CaCO_3$)	Total Hardness (mg/L $CaCO_3$)	Total Dissolved Solids (mg/L)	Nitrate (mg/L)	Phosphate (mg/L)	Chloride (mg/L)
Little Paint above Windber Country Club	11.1	6.99	41.0	12	44	20	0	0	14
Little Paint below Elton Sportsman's Dam	15.6	7.6	97.0	32	56	48	0	0	16
Unnamed Tributary by Dick's Auto	13.0	7.53	334.0	38	68	167	0	0	92
Fox's Run	12.1	6.86	29.0	8	36	14	0	<0.2	12
Little Paint at Rt. 160 pull-off	13.7	7.86	166.0	39	56	83	0	0	32
Rocky Run	14.1	8.39	590.0	92	104	294	0	<0.2	127
Minnow Creek	12.7	7.95	124.0	42	56	62	0	0	20

Data collected by:

Melissa Reckner, Kiski-Conemaugh Stream Team
Greg Shustrick, Somerset Conservation District

Hanna Combo Meter: TDS, Water Temp., pH, Cond.
LaMotte Limnology Kit: Alkalinity, Hardness, D.O., N, P
LaMotte Individual Kit: Chloride

Water Chemistry from select sites throughout the Little Paint Creek watershed November 15, 2010

Site	Date	pH	Temp. (°C)	Cond. (uS/cm)	TDS (ppm)
Little Paint below Windber Country Club	11/15/2010	6.08	6.0	42	21
Little Paint spring at Windber Country Club	11/15/2010	6.69	5.6	142	72
Little Paint spring below pond with Fountain at Windber Country Club	11/15/2010	7.4	6.4	70	35
Little Paint Pond 2 at Windber Country Club	11/15/2010	7.43	6.0	54	27
Little Paint at Windber Country Club Bridge downstream of ponds	11/15/2010	6.41	5.6	57	28
Little Paint Little Stonewall Pond at Windber Country Club	11/15/2010	6.41	8.0	31	15
Little Paint Pond 3 at Windber Country Club	11/15/2010	6.59	6.0	57	28
Little Paint on Old Bedford Pike	11/15/2010	6.91	7.5	84	41
Rocky Run at Schoolhouse Road	11/15/2010	7.36	7.6	626	313
Vo-Tech Pond	11/15/2010	7.41	8.5	914	456
Rocky Run at Vo-Tech Dr.	11/15/2010	7.67	7.7	676	335
Rocky Run behind Walmart along Macridge Ave.	11/15/2010	7.57	6.8	825	412
Rocky Run beside Panera Bread	11/15/2010	7.53	8.0	1033	516
Retention pond behind Richland Cinemas	11/15/2010	7.31	10.3	1612	804
UPJ's Big Pond	11/15/2010	7.48	10.2	756	376
UPJ Stream by ball fields	11/15/2010	7.29	8.0	756	376
Little Paint below Elton Sportsmen's Dam	11/15/2010	7.64	6.9	94	47

Data collected by:

Melissa Reckner, Kiski-Conemaugh Stream Team
Eric Null, Somerset Conservation District
Josh Penatzer, Somerset Conservation District

Hanna Combo Meter: pH, Temp., Cond., TDS

Water Chemistry Data
Little Paint Creek "Mouth" near Thomas Cars Site: 7488-361
Data Collected by: Kiski-Conemaugh Stream Team
Laboratory Analysis by: Pennsylvania Department of Environmental Protection's Bureau of Laboratories

Time limit for test exceeded

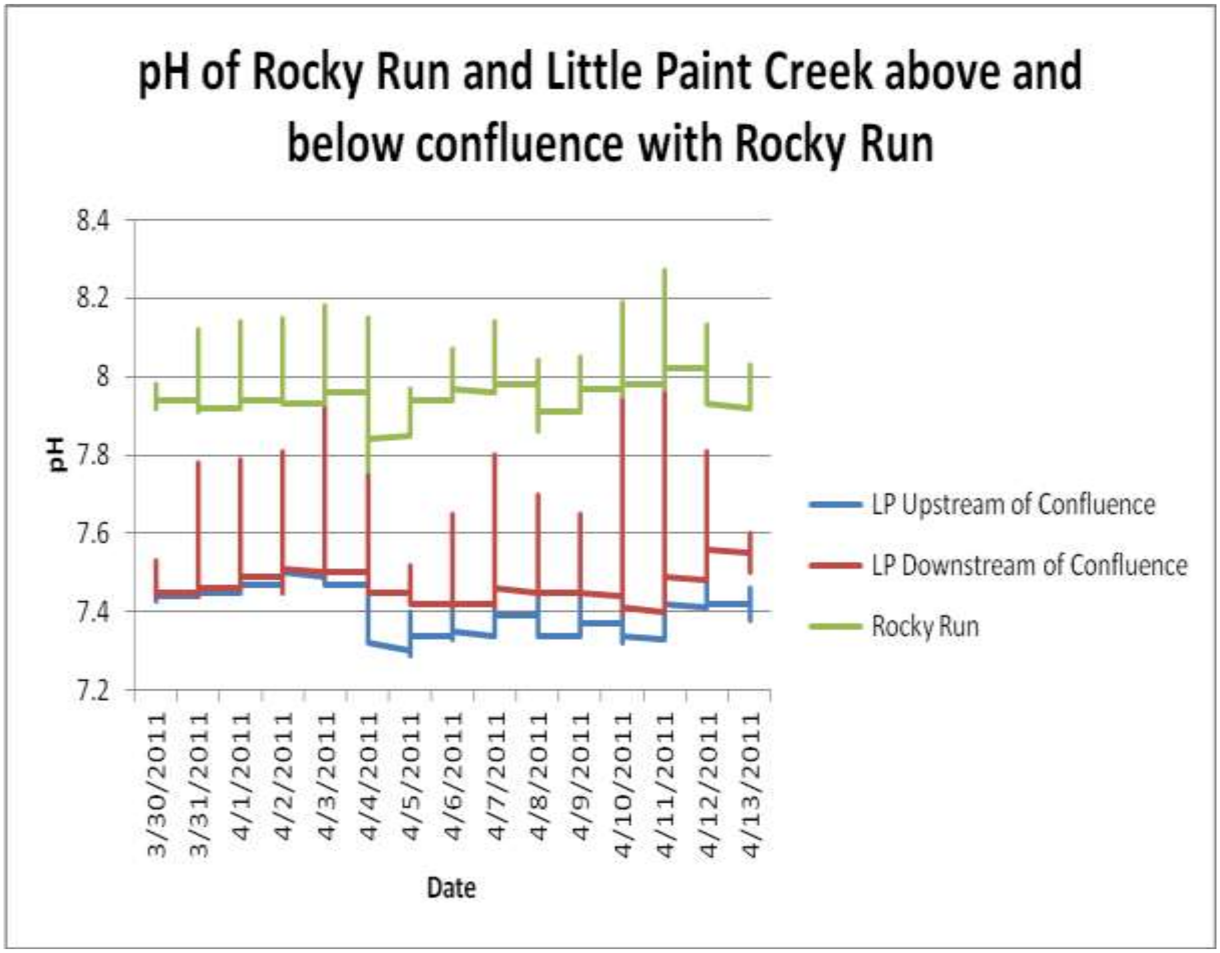
Analyzed by Ion Chromatography

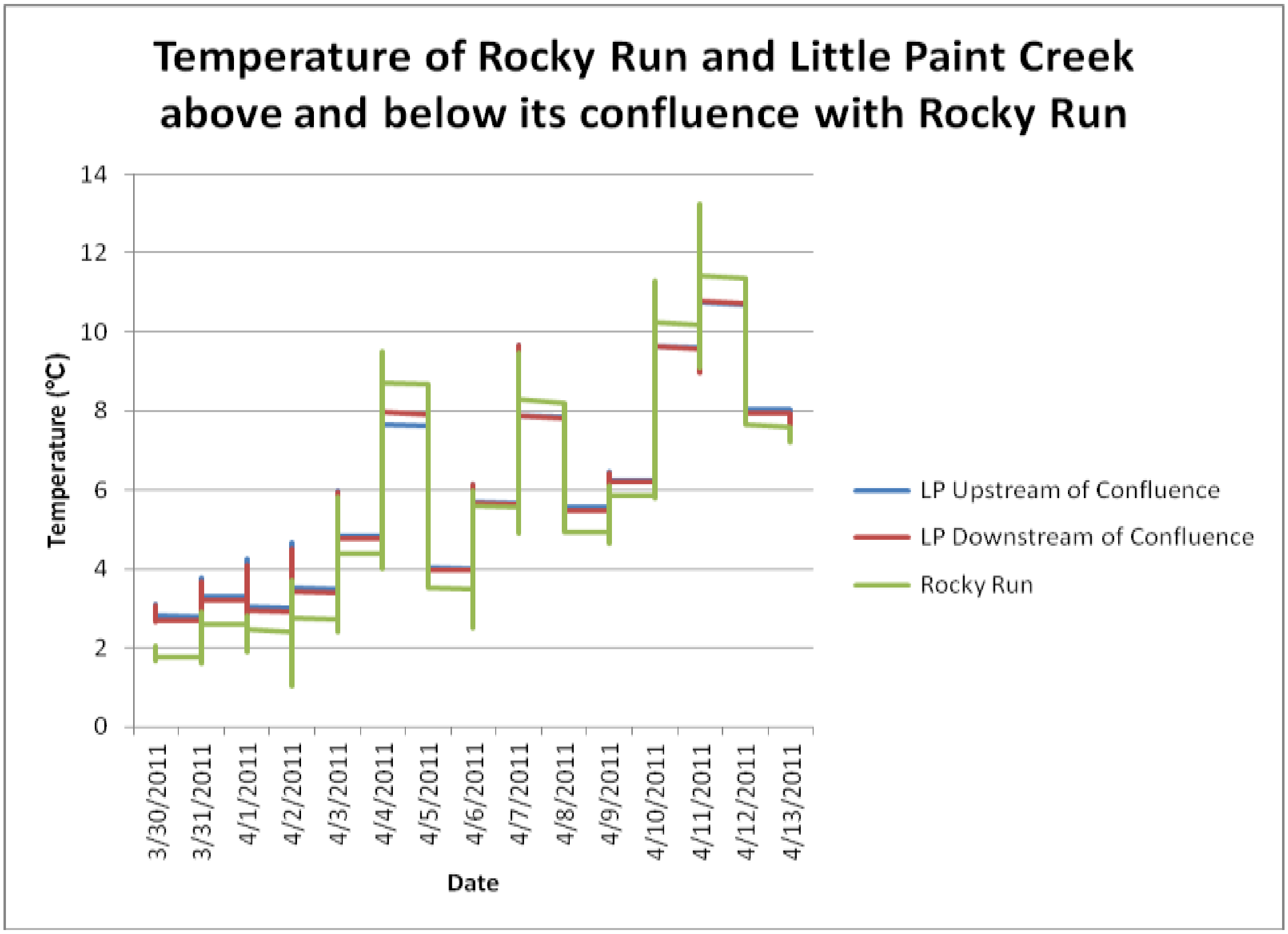
measured to endpoint 8.3

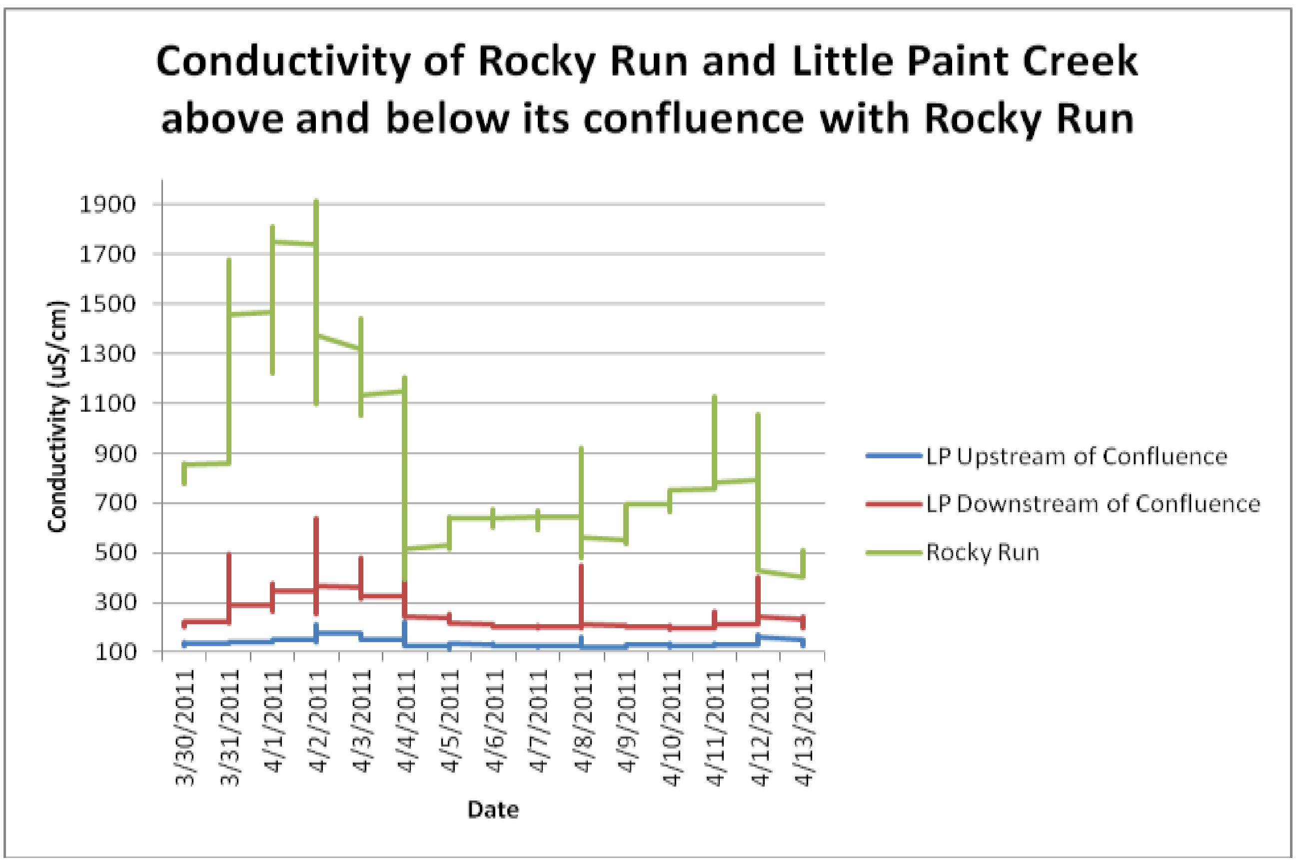
Date	Field pH	Field Conductivity (uS/cm)	Field Water Temperature (°F)	pH with 3.9 Alk.	Alk @ pH 3.9 (mg/L)	TDS @ 105 C (mg/L)	Total Suspended Solids (mg/L)	Ferrous Iron (mg/L)	Total Sulfate (mg/L)	Total Iron (mg/L)	Total Manganese (mg/L)	Total Aluminum (mg/L)	Hot Acidity (mg/L)
11/29/2006				7.4	37.6		4.0	0.340	29.6	0.839	<0.050	0.632	-23.20
12/20/2006			38.0	7.4	43.0		<3	1.330	43.1	2.000	0.050	0.855	20.40
2/27/2007			31.0	7.2	37.4		6.0	1.100	47.4	1.860	0.139	0.932	-22.60
3/31/2007			50.0	6.6	17.8		22.0	3.170	60.7	4.670	0.119	2.670	36.80
4/30/2007			57.0	6.7	20.4		8.0	4.860	53.4	6.179	0.115	2.339	1.00
5/29/2007			73.0	6.1	11.2		16.0	10.490	126.4	14.400	0.260	4.470	59.60
7/2/2007	7.40	427	57.3	6.7	23.8		16.0	5.020	110.3	9.490	0.227	2.960	29.00
8/2/2007	7.02	442	70.0	7.7	43.6		18.0	0.280	122.8	4.400	0.217	1.510	-95.40
9/3/2007	6.97		59.2	7.5	43.8		8.0	0.770	42.0	2.070	0.082	0.987	1.60
9/30/2007	6.58	402	57.3	7.1	41.2		66.0	3.340	99.8	18.200	0.164	6.920	16.40
10/28/2007	6.97	353	50.4	7.7	61.8		8.0	0.500	64.7	2.290	0.083	0.686	-14.40
11/25/2007	7.17	317	42.5	7.6	53.0		6.0	0.690	48.7	1.450	<0.050	<.500	-41.00
1/6/2008	6.88	428	42.3	7.1	28.0		8.0	0.670	32.5	1.800	0.096	0.966	-12.40
2/3/2008	6.71		38.7	7.1	28.4		4.0	1.770	38.2	2.216	0.061	0.922	-14.20
3/8/2008	6.47		46.2	7.0	23.0		4.0	0.770	27.7	1.250	0.070	0.670	-7.40
4/6/2008	6.78		48.7	6.5	16.6		20.0	5.810	77.0	7.920	0.125	2.582	4.20
5/4/2008	7.10	290	53.0	7.1	33.4		20.0	2.360	41.8	3.675	0.076	1.166	4.20
7/6/2008	7.17	341	66.3	7.5	54.6		8.0	0.840	68.8	4.406	0.093	1.269	-34.40
8/3/2008	6.91	428	70.3	7.5	40.4		12.0	0.430	99.3	6.244	0.245	2.251	-28.20
9/1/2008	7.01		55.8	7.5	53.2		18.0	0.420	99.0	5.528	0.179	1.633	-34.80
10/12/2008	7.04	389	49.7	7.5	60.8		6.0	0.520	72.5	2.688	0.104	0.676	-42.40
11/2/2008	7.20	394	46.8	7.9	68.4		12.0	0.310	189.8	1.605	0.059	<.500	-59.00

	Date	Field pH	Field Conductivity (uS/cm)	Field Water Temperature (°F)	pH with 3.9 Alk.	Alk @ pH 3.9 (mg/L)	TDS @ 105 C (mg/L)	Total Suspended Solids (mg/L)	Ferrous Iron (mg/L)	Total Sulfate (mg/L)	Total Iron (mg/L)	Total Manganese (mg/L)	Total Aluminum (mg/L)	Hot Acidity (mg/L)
	12/7/2008	7.39	372	33.8	7.7	52.2		12.0	0.430	32.9	1.022	<0.050	<.500	-37.20
	1/3/2009	6.68	230	38.1	7.3	29.8		10.0	0.490	29.3	1.203	0.054	0.673	-5.80
	2/1/2009	7.09	506	39.0	7.2	35.4		8.0	2.100	39.3	2.790	0.080	1.370	-18.60
	4/26/2009				7.3	40.6		8.0	1.350	43.2	2.268	0.138	0.999	-23.00
	10/4/2009	7.66	393	53.4	7.8	67.4		12.0	0.100	55.3	0.626	0.068	<.500	-52.30
	1/23/2010	7.23	476	39.0	7.3	35.6		<5	0.380	32.5	0.718	0.073	0.534	-19.20
	4/25/2010	7.28	333	53.2	6.8	23.0		20.0	5.400	65.0	7.404	0.130	2.887	3.80
	7/25/2010				7.3	47.2	190	132.0	0.560	21.1	5.871	0.276	2.661	-26.20
	10/24/2010	7.07	251	58.6	7.1	48.4	194	<5	0.400	40.5	1.866	0.050	0.561	-34.00
	1/16/2011	6.17	261	41.2	7.2	38.0	196	8.0	1.520	122.5	2.090	0.062	0.952	-23.20
	4/21/2011	6.79	459		6.4	24.6	166	6.0	4.480	111.7	5.501	0.091	1.726	-2.60
	7/13/2011	6.94	461	68.7	6.5	21.0	298	28.0	5.380	254.9	15.008	0.271	3.522	5.40
Count	34.00	26.00	21.00	30.00	34.00	34.00	5.00	31.00	34.00	34.00	34.00	31.00	30.00	34.00
Max		7.66	506.00	73.00	7.90	68.40	298.00	132.00	10.49	254.90	18.20	0.28	6.92	59.60
Min		6.17	230.00	31.00	6.10	11.20	166.00	4.00	0.10	21.10	0.63	0.05	0.53	-95.40
Average		6.99	378.71	50.95	7.19	38.37	208.80	17.23	2.01	71.87	4.46	0.12	1.77	-14.39

Water Chemistry Data of Rocky Run and Little Paint Creek above and below its confluence with Rocky Run
Source: Saint Francis University
March – April 2011




Temperature of Rocky Run and Little Paint Creek above and below its confluence with Rocky Run
Temperature (°C)
0
2
4
6
8
10
12
14
3/30/2011
3/31/2011
4/1/2011
4/2/2011
4/3/2011
4/4/2011
4/5/2011
4/6/2011
4/7/2011
4/8/2011
4/9/2011
4/10/2011
4/11/2011
4/12/2011
4/13/2011
Date
LP Upstream of Confluence
LP Downstream of Confluence
Rocky Run


Conductivity of Rocky Run and Little Paint Creek above and below its confluence with Rocky Run
Conductivity (uS/cm)
100
300
500
700
900
1100
1300
1500
1700
1900
3/30/2011
3/31/2011
4/1/2011
4/2/2011
4/3/2011
4/4/2011
4/5/2011
4/6/2011
4/7/2011
4/8/2011
4/9/2011
4/10/2011
4/11/2011
4/12/2011
4/13/2011
Date
LP Upstream of Confluence
LP Downstream of Confluence
Rocky Run

Appendix 3 – Macroinvertebrates

Macroinvertebrates collected September 22, 2010
by Somerset Conservation District and Kiski-Conemaugh Stream Team.

Order	Family	Genus	LP US of CC	LP Below Elton Dam	UNT @ Dick's	Fox's Run	LP @ 160	Rocky Run	Minnow Creek
Ephemeroptera	Baetidae	*Baetis*				2	63		
		Acentrella	1			2	16		2
	Baetiscidae	*Baetisca*					3		
	Ephemerellidae	*Eurylophella*				1			1
	Ephemeridae	*Ephemera*							3
	Heptageniidae	*Stenonema*	3	16		1	28		2
	Isonychidae	*Isonychia*				1	61		
	Leptophlebiidae	*Habrophlebia*				4			
Plecoptera	Capniidae	*Capnia*	1			1	2		
	Chloroperlidae	*Haploperla*	1				5	1	1
		Suwallia	1						
		Sweltsa					1		1
	Leuctridae	*Zealeuctra*	1						
	Perlidae	*Acroneuria*					1		
Trichoptera	Hydropsychidae	*Cheumatopsyche*	3	6	6	3	10		1
		Hydropsyche			2	3	76		
	Odontoceridae	*Psilotreta*			1		1		1
	Philopotomidae	*Dolophilodes*	2				12		
	Polycentropodiae	*Polycentropus*							1
	Psychomyiidae	*Psychomyia*				1			
	Rhyacophilidae	*Rhyacophilia*				1			
Amphipoda	Gammaridae	*Gammarus*		3					
Anisoptera	Gomphidae	*Lanthus*							2
Coleoptera	Elimidae	*Optioservus*		2	10	1	18	1	1
		Microcylloepus					3		
	Psephenidae	*Psephenus*					1		
Decapoda	Cambarridae		1	1			2		1

Order	Family	Genus	LP US of CC	LP Below Elton Dam	UNT @ Dick's	Fox's Run	LP @ 160	Rocky Run	Minnow Creek
Diptera	Anthericidae	*Antherix*					19		
	Chironomidae		3	2	4	2	25		4
	Empididae	*Clinocera*	1						
	Simuliidae	*Simulium*					1		
	Stratiomyidae	*Stratiomys*				1			
	Tabanidae	*Chrysops*			4				
	Tipulidae	*Dicranotoa*			7	3	4		
		Tipula			1				1
Isopoda	Asellidae	*Caecidotea*						1	
Megaloptera	Corydalidae	*Nigronia*		1			1		
	Sialidae	*Sialis*			1				
Olighochaeta			1				1		
		TOTAL INDIVIDUALS	**19**	**31**	**36**	**27**	**354**	**3**	**22**

Macroinvertebrates collected May 17, 2011
by Somerset Conservation District and Kiski-Conemaugh Stream Team.

			Site						
Order	**Family**	**Genus**	**LP US of CC**	**LP Below Elton Dam**	**UNT @ Dick's**	**Fox's Run**	**LP @ 160**	**Rocky Run**	**Minnow Creek**
Ephemeroptera	Baetidae	*Acentrella*					36	3	
		Baetis						4	
	Ephemerellidae	*Ephemerella*					4		10
		Eurylophella					3	1	
	Ephemeridae	*Ephemera*				1			5
	Heptageniidae	*Epeorus*							22
		Stenacron	2	2		1			
		Stenonema	5	12		10	6		6
	Isonychidae	*Isonychia*					16		
	Leptophlebiidae	*Habrophlebia*				8			
		Paraleptophelibia					5		2
Plecoptera	Capniidae	*Capnia*	2	6		6	2		
		Utacapnia						1	
	Chloroperlidae	*Alloperla*					10		
		Sweltsa	1					1	2
		Utaperla						1	
	Leuctridae	*Leuctra*						5	
		Paraleuctra					105		
		Zealeuctra	5	56		10	32	47	14
	Nemouridae	*Amphinemura*	4	71		5	1		21
		Prostoia				1			
	Perlidae	*Acroneuria*						1	
	Perlodidae	*Isoperla*						1	
Tricoptera	Glossosomatidae	*Glossosoma*		4					
	Hydropsychidae	*Cheumatopsyche*	4	63	1	7	5	54	6
		Hydropsyche		6			65		1
	Lepidostomatidae	*Lepidostoma*				6		5	
	Limnephilidae	*Hydatophylax*			2		1	3	1
		Pycnopsyche	1			1			
	Odontoceridae	*Marilia*		2					
	Philopotamidae	*Chimarra*		42					
		Dolophilodes						1	

			Site						
Order	**Family**	**Genus**	**LP US of CC**	**LP Below Elton Dam**	**UNT @ Dick's**	**Fox's Run**	**LP @ 160**	**Rocky Run**	**Minnow Creek**
Tricoptera (con't)		*Polycentropus*					3		
	Polycentropodidae	*Cyrnellus*						3	
		Nyctiopylax							1
	Psychomyiidae	*Lype*		1			2		
	Rhyacophilidae	*Rhyacophilia*					3	6	
	Uenoidae	*Neophylax*					23		
Anisoptera	Aeshnidae	*Boyera*		1	1				
	Gomphidae	*Lanthus*		1		3			
Coleoptera	Elmidae	*Microcylloepus*					7	3	
		Optioservus						2	
		Stenelmis							2
	Psephenidae	*Psephenus*				1	2		
Decapoda	Cambarridae		4			2	3	2	2
Diptera	Anthericidae	*Antherix*					2		
	Chironomidae		4	15	3	14	100	84	5
	Simuliidae	*Simulium*		4		19	273	4	
	Tipulidae	*Antocha*		1			31	1	1
		Cryptolabis	1			2			
		Dicranota				4			
		Hexatoma	3		2	1			
		Limnophila						5	
		Tipula						1	
Isopoda	Asellidae	*Lirceus*					2		
		Caecidotea		2					
	Gammaridae	*Gammarus*		2					
Megaloptera	Corydalidae	*Nigronia*		5		1			
Mollusca	Lymnaeidae	*Fossaria*					1		
Oligochaeta							2		
		TOTAL INDIVIDUALS	**36**	**296**	**9**	**103**	**745**	**239**	**101**

Fall 2010 and Spring 2011 Pooled Macroinvertebrate ICE Scores

(ICE – In-stream Comprehensive Evaluation)

Site	Total Taxa	ICE Score	EPT	ICE Score	Becks	ICE Score	HBI	ICE Score	Diversity	ICE Score	Sensitive Ind	ICE Score
LP US CC	12	0.363636364	7	0.368421053	2	0.0526316	4.158	0.4545455	2.351	0.822028	37	0.4378698
LP Below Elton Dam	7	0.212121212	1	0.052631579	0	0	4.355	0.4339839	1.46	0.51049	3	0.035503
UNT @ Dicks	9	0.272727273	3	0.157894737	3	0.0789474	3.972	0.4758308	1.92	0.671329	33	0.3905325
Fox Run	15	0.454545455	9	0.473684211	1	0.0263158	3.926	0.481406	2.57	0.898601	44	0.5207101
LP 160	23	0.696969697	11	0.578947368	11	0.2894737	3.915	0.4827586	2.358	0.824476	31	0.3668639
Rocky Run	3	0.090909091	1	0.052631579	0	0	4.33	0.4364896	1.099	0.384266	33	0.3905325
Minnow Creek	14	0.424242424	7	0.368421053	4	0.1052632	3.909	0.4834996	2.425	0.847902	36	0.4260355

Macroinvertebrates Collected by Thomas Clark for Paint Creek Watershed Restoration Plan

2005

Order	Family	LPC-S02	LPC-S03	LPC-S04	LPC-S05
Ephemeroptera	Baetidae	15	170	13	
	Ephemerellidae	2			
	Oligoneuridae	8	2	3	1
Plecoptera	Chloroperlidae		3		
	Leuctridae	18	2	1	
	Nemouridae				1
	Perlodidae		5		
	Taeniopterygidae				1
Tricoptera	Glossosomatidae	1	4		
	Hydropsychidae	50	14	3	2
	Hydroptilidae	1			
	Limnephilidae		3		
	Philopotamidae	2	1		
	Rhyacophilidae	6	1		
Coleoptera	Elmidae	20		5	6
	Hydrophilidae	1			
Diptera	Chironomidae	9	11	6	3
	Simuliidae	1			
	Tipulidae		1		
Odonata	Gomphidae			1	
Oligochaeta		1			
Unknown (pupae)		6	3		1
	TOTAL INDIVIDUALS	**135**	**217**	**32**	**14**
	diversity (d)	2.956	1.469	2.352	2.626
	# of taxa (R)	15	13	7	7
	density (ft^2)	70.5	110.0	16.0	6.0

Appendix 4 – Fish

Fish data for all sites except Minnow Creek acquired September 20-23, 2010 by Pennsylvania Fish and Boat Commission, Kiski-Conemaugh Stream Team, and Somerset Conservation District. Minnow Creek fish data acquired November 4, 2011 by Western Pennsylvania Conservancy and Kiski-Conemaugh Stream Team.

Fish Species and Quantity per Site

		Site					
Common Name	**Scientific Name**	**LP US of CC**	**LP Below Elton Dam**	**Fox's Run**	**LP @ 160**	**Rocky Run**	**Minnow Creek**
Blacknose Dace	*Rhinichthys atratulus*	14	179	13	289	39	55
Bluegill	*Lepomis macrochirus*		50				
Brown Bullhead	*Ameiurus nebulosus*		3				
Brook Trout (Hatchery)	*Salvelinus fontinalis*			1			
Brook Trout (Wild)	*Salvelinus fontinalis*			14			
Brown Trout (Hatchery)	*Salmo Trutta*			1	4		
Creek Chub	*Semotilus atromaculatus*	103	190	9		26	67
Golden Shiner	*Notemigonus crysoleucas*		1				
Largemouth Bass	*Micropterus salmoides*		10	1			
Mottled Sculpin	*Cottus bairdii*		42	33	726	3	46
Pumpkinseed	*Lepomis gibbosus*		51				
Rock Bass	*Ambloplites rupestris*		3				
Silverjaw Minnow	*Notropis buccatus*			1			
White Sucker	*Catostomus commersonii*		56	6	1	9	
	TOTAL INDIVIDUALS	**117**	**585**	**79**	**1020**	**77**	**168**
	TOTAL SPECIES	**2**	**10**	**9**	**4**	**4**	**3**

Fish Species and Quantity from all Survey Sites 2010 - 2011

Common Name	Scientific Name	Quantity
Blacknose Dace	*Rhinichthys atratulus*	589
Bluegill	*Lepomis macrochirus*	50
Brown Bullhead	*Ameiurus nebulosus*	3
Brook Trout (Hatchery)	*Salvelinus fontinalis*	1
Brook Trout (Wild)	*Salvelinus fontinalis*	14
Brown Trout (Hatchery)	*Salmo trutta*	5
Creek Chub	*Semotilus atromaculatus*	395
Golden Shiner	*Notemigonus crysoleucas*	1
Largemouth Bass	*Micropterus salmoides*	11
Mottled Sculpin	*Cottus bairdii*	850
Pumpkinseed	*Lepomis gibbosus*	51
Rock Bass	*Ambloplites rupestris*	3
Silverjaw Minnow	*Notropis buccatus*	1
White Sucker	*Catostomus commersonii*	72
	TOTAL INDIVIDUALS	**2046**
	TOTAL SPECIES	**14**

PA Fish and Boat Commission surveys
Fish species occurrence
Little Paint Creek Section 01 Site 0201 (River Mile 4.87)
Below Elton Sportsmen's Dam

		Date		
Common Name	**Scientific Name**	**1979**	**2001**	**2010**
Blacknose Dace	*Rhinichthys atratulus*	X	X	X
Bluegill	*Lepomis macrochirus*		X	X
Brown Bullhead	*Ameiurus nebulosus*		X	X
Brook Trout (Hatchery)	*Salvelinus fontinalis*		X	
Brown Trout (Hatchery)	*Salmo trutta*		X	
Creek Chub	*Semotilus atromaculatus*	X	X	X
Golden Shiner	*Notemigonus crysoleucas*			X
Largemouth Bass	*Micropterus salmoides*			X
Mottled Sculpin	*Cottus bairdii*	X	X	X
Pumpkinseed	*Lepomis gibbosus*			X
Rock Bass	*Ambloplites rupestris*		X	X
White Sucker	*Catostomus commersonii*		X	X
	TOTAL SPECIES	**3**	**9**	**10**

PA Fish and Boat Commission surveys
Fish species occurrence
Little Paint Creek Section 02 Site 0202 (River Mile 2.85)
Just upstream of State Route 160 bridge

		Date		
Common Name	**Scientific Name**	**1979**	**2001**	**2010**
Blacknose Dace	*Rhinichthys atratulus*	X	X	X
Brook Trout (Hatchery)	*Salvelinus fontinalis*		X	
Brook Trout (Wild)	*Salvelinus fontinalis*	X		
Brown Trout (Hatchery)	*Salmo trutta*		X	X
Brown Trout (Wild)	*Salmo trutta*		X	
Creek Chub	*Semotilus atromaculatus*	X	X	
Mottled Sculpin	*Cottus bairdii*		X	X
Northern Hog Sucker	*Hypentelium nigricans*	X		
White Sucker	*Catostomus commersonii*	X		X
	TOTAL SPECIES	**5**	**6**	**4**

Appendix 5 – Visual Assessment

May 17, 2011

Evaluators: Melissa Reckner and Greg Shustrick

Weather Conditions: Light to Moderate Rain; rain and sun the last 2-5 days

Little Paint Creek Watershed Visual Assessment

Dominant substrate: Boulder _____ Cobble _____ Gravel _____ Silt _____ Mud _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition

Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	3 2	1

aggradation: The process by which a stream's gradient steepens due to increased deposition of sediment.

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone

Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability

Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

Keys: **<u>All</u>** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Water Appearance

Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. If you dipped a glass in the water, what would the water look like?

Nutrient Enrichment

Clear water along entire reach; diverse aquatic plant community little algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrates.	Greenish water along entire reach; abundant algal growth, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms create thick algal mats in stream.
10 9 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers

No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 3 miles of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would impede fish passage.

Instream Fish Cover

>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	8 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other: ________

Embeddedness

Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as the degree to which objects in the stream bottom are surrounded by fine sediment. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. Be sure that you are looking at the entire reach, not just one riffle. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat

At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: ____________

Canopy Cover

Keys: This pertains to waterways where channel is 50' or less.

Coldwater fishery

>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Site	Dominate Substrate					Channel Conditions
	Boulder	Cobble	Gravel	Silt	Mud	
Minnow Creek	X	X	X			8
Little Paint Creek Upstream of Windber Country Club		X		X		3
Little Paint Creek Below Elton Sportsmen's Dam		X	X			8
Unnamed Tributary by Dick's Auto			X	X		6
Fox's Run		X	X			9
Little Paint Creek at SR 160		X				9
Rocky Run		X	X	X		8

Site	Riparian Zone	Bank Stability	Water Appearance	Nutrient Enrichment	Fish Barriers	Instream Fish Cover
Minnow Creek	9	3	9	9	8	7
Little Paint Creek Upstream of Windber Country Club	9	3	10	9	5	7
Little Paint Creek Below Elton Sportsmen's Dam	9	8	3	6	9	7
Unnamed Tributary by Dick's Auto	8	7	4	5	9	4
Fox's Run	9	8	8	9	8	8
Little Paint Creek at SR 160	9	8	6	6	9	8
Rocky Run	10	9	4	3	9	4

Site	Embedded-ness	Insect / Invertebrate Habitat	Canopy Cover Coldwater Fishery	Total Score	Rating
Minnow Creek	9	9	9	8.0	**Good**
Little Paint Creek Upstream of Windber Country Club	5	9	8	6.8	**Fair**
Little Paint Creek Below Elton Sportsmen's Dam	9	8	6	7.3	**Fair**
Unnamed Tributary by Dick's Auto	3	4	5	5.5	**Poor**
Fox's Run	9	10	10	8.8	**Good**
Little Paint Creek at SR 160	9	9	7	8.0	**Good**
Rocky Run	9	4	10	7.0	**Fair**

TOTAL SCORE:
(Add all scores and divide by number of scores given)

< 6.0 = POOR
6.1 – 7.4 = FAIR
7.5 – 8.9 = GOOD
> 9.0 = EXCELLENT

Appendix 6 – Stream Widths

	Little Paint Creek Above Windber Country Club	Little Paint Creek Below Elton Sportsmen's Dam	Fox's Run	Rocky Run	Little Paint Creek at SR 160 Bridge	Minnow Creek
Date	9/21/10	9/20/10	9/21/10	9/23/10	9/20/10	11/4/11
Average	2.8	5.72	3.7	2.3	~ 4.5	3.8


L. Lichvar


M. Reckner


M. Reckner


M. Reckner


M. Reckner


M. Reckner


E. Null