

**THE PENNSYLVANIA RIVERS  
CONSERVATION PROGRAM**

**FINAL  
UPPER WEST BRANCH SUSQUEHANNA RIVER  
CONSERVATION PLAN**

**Prepared By:  
The Cambria County  
Conservation and Recreation Authority**

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# UPPER WEST BRANCH RIVERS CONSERVATION PLAN

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## ***EXECUTIVE SUMMARY***

The grant opportunity that facilitated this project was made possible through the Keystone Recreation, Park and Conservation Fund under the Administration of the PA-Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. The program was developed to conserve and enhance river resources through preparation and accomplishment of locally initiated plans. The program provides technical and financial assistance to municipalities and river support groups to carry out planning, implementation, acquisition and development activities. A registry is established to recognize local river conservation efforts.

In 1999 the Cambria County Conservation and Recreation Authority (CCCRA) applied for and obtained such a grant to conduct a study of the Upper West Branch of the Susquehanna River. The CCCRA has partnered with the Conservation Districts of Cambria and Clearfield Counties, Headwaters RC&D of Clearfield and Southern Alleghenies RC&D in this endeavor.

The planning project identifies significant natural, recreational and cultural resources. Issues, concerns and threats to river resources and values are determined locally as part of planning, as well as recommending methods to conserve, enhance and restore. The end result would be a comprehensive watershed plan that would designate segments for the Pennsylvania Rivers Registry.

This registry promotes river conservation and recognizes waterways or waterway segments in communities who have completed river conservation plans. It is also an avenue to endorse local initiatives by binding them together in a state wide recognition program. In order for a river to be placed on the registry it must have an approved plan and local municipal support. Registry status must be achieved to qualify for implementation, development, or acquisition grants.

Potential projects as identified in the Plan could be for water, waste water, recreational needs, storm water management and abandoned mine discharge remediation. Most of these types of infrastructure projects cannot be done currently at the local level due to the rural nature of the communities in the proposed watershed under current funding sources. As a result, economic development in this region is stagnant.

This project was developed as part of an integrated, multi-county approach to monitor, prioritize, and implement a strategic plan for improving water quality in the upper reaches of the West Branch Susquehanna River Basin and tributaries that have severely degraded water quality. In addition to the West Branch of the Susquehanna River from its headwaters, the project includes the tributaries of Chest Creek, Clearfield Creek, Little Clearfield Creek, Anderson Creek, and Moshannon Creek.

## **I. PROJECT AREA CHARACTERISTICS**

### **A. GENERAL WATERSHED OVERVIEW**

The Upper West Branch of the Susquehanna River is located in Central Pennsylvania. The West Branch originates near Carrolltown in Cambria County and drains a 675 square mile watershed in the study area of Cambria, Centre, Clearfield and Indiana Counties. After exiting Clearfield County, the river travels 114 miles further before meeting the North Branch of the Susquehanna River in Union County near the town of Northumberland, Pennsylvania. From here, the Susquehanna travels south another 60 miles where it flows into the Chesapeake Bay at Havre de Grace, Maryland. This study area of this project surrounds the 110 river miles of the mainstem and its major tributaries beginning at the headwaters to the confluence with Moshannon Creek, located 3 miles up river from the village of Karthaus.

Throughout the watershed, major tributary waters are received from Clearfield Creek originating in Cresson in Cambria County; from Chest Creek which begins just south of Bradley Junction in Cambria County and confluences with the West Branch in Mahaffey in Clearfield County; from Moshannon Creek which enters the West Branch near the village of Karthaus in Clearfield County; from Little Clearfield Creek which is formed by the confluence of Watts Creek with Gazzam Run near the village of Kerrmorr in Clearfield County; and Anderson Creek, where we see its headwaters flowing southward to the confluence with the West Branch in Curwensville. The Upper West Branch of the Susquehanna River Basin includes parts of four (4) counties which are Cambria, Centre, Clearfield and Indiana. The basin had a population of about 114,939 persons in 1996.

The Upper West Branch of the Susquehanna River Basin's deep canyons and winding characteristics make it a particularly scenic waterway. These rural settings allow for much natural beauty and unchanged environment. The abandoned mine drainage which now is a major factor in the degradation of the river has become one of the main issues among communities throughout the watershed.

The first reach of the river represents the upper 50 miles from headwaters at Carrolltown to the mouth of Chest Creek at Mahaffey. The waterway here generally follows U.S. Route 219 North and passes through towns such as Northern Cambria, Cherry Tree, Burnside and Mahaffey. Much of this reach is characterized as severely degraded with the absence of biological communities and high concentrations of aluminum, sulfate, and dissolved solids. It is in this section, a mere 2 miles from the headwaters, that perhaps the largest polluter of the water exists, the Barnes-Watkins coal refuse pile near Bakerton. An 80 year old relic of underground coal mining by-product, this smoldering behemoth contains 1,250,000 cubic yards of abandoned coal refuse and covers about 18 acres of ground. Situated nearly on top of the still small West Branch, this "boney dump" is continually leaching acid and metals into the stream in addition to the runoff of contaminated sediment.

The second reach extends approximately 37 miles, from the Chest Creek confluence at Mahaffey to the mouth of Clearfield Creek in Clearfield. The Curwensville Dam is located in this section. Because of the better water quality in Chest Creek and several smaller non-impaired tributaries, the stream sees some improved conditions. Improvements to this sections have been documented over the last 40 years. Most of these changes have been brought about by reclamation of abandoned coal mines. The enhancement of this section of river through Acid Mine Drainage Abatement indicates that the problems that exist upstream could also be alleviated by the same methods.

The final reach is from Clearfield to the confluence of Moshannon Creek, three miles upriver from the village of Karthaus. Thirty miles of river comprise this section. Once again, the stream here is severely impaired to a point where no aquatic life exists and dissolved solids, acidity, manganese and sulfate concentrations are high. This is largely due to the Abandoned Mine Drainage associated with Clearfield and Moshannon Creeks.

## **B. TOPOGRAPHY, GEOLOGY AND SOILS**

The West Branch of the Susquehanna River is located in the low rolling hills of the Allegheny Mountains in Pennsylvania, and flows northeast passing the steep hillsides of the Allegheny High Plateaus Section. At Renovo, the West Branch turns southeast and cuts through the Allegheny Front entering a region of broad valleys separated by long high ridges. Following the northern flank of Bald Eagle Mountain northeastward, the West Branch turns south to its confluence with the Susquehanna River near Sunbury.

The topography of the study area is typical of the Appalachian Plateau Province. The general type of topography is narrow V-shaped valleys separated by rolling plateau country extending to the higher ridges and broken uplands. The valleys are from 200 to 500 feet below the plateau, and the higher ridges stand as much as 1,000 feet above the plateau areas. The Chestnut Ridge rises to a maximum elevation of 2,405 feet in Goshen Township, the highest point in Clearfield County. The West Branch of the Susquehanna River leaves Clearfield County in Karthaus Township, in the northeast corner of the county at an elevation of 798 feet, the lowest point in Clearfield County. As the river enters the county in the southwest corner of Burnside Township, its elevation is 1,364 feet, which constitutes an elevation drop of 566 feet as it winds northeastward through the county.

This area is located in the Appalachian Plateau's physiographic province on the Pittsburgh Plateau and is underlain with coal-bearing rocks from the Pottsville, Allegheny and Conemaugh groups, with most of the commercial coals in the Allegheny group.

Soils within the study area within Cambria and Clearfield Counties are generally formed from residuum of gray and brown shale, sandstone and siltstone. Soil depths vary between 31 and 60 inches. Slopes vary from 3 to 80 percent, but generally from 3 to 65 percent. The predominant soil types in the study area are of the Rayne-Gilpin-Ernest association, followed by the Udorthents-Gilpin-Rayne, and the Cookport, Hazleton, Clymer association. A large percentage of soils adjacent to the waterways in the area are

of the Atkins-Philo-Monongahela association. These soils are generally deep, well drained, and are gently sloped soils on flood plains that are prone to erosion. Soils in this region have a moderate to high erodibility. Rayne, Allegheny and Clymer soils are among the most productive for agricultural use in the study area. SEE SOILS MAP PAGE M 9.

**C. TRIBUTARIES**

For management purposes and river conservation planning, the Upper West Branch of the Susquehanna River Basin has been separated into five major drainage watersheds. These are:

Watersheds	Drainage Area (sq. miles)
Clearfield Creek	393
Moshannon Creek	274
Chest Creek	129
Anderson Creek	77.7
Little Clearfield Creek	44.4
TOTAL	913.1

*Clearfield Creek* contains a subbasin drainage of 393 square miles. Beginning in Cambria County near the Borough of Cresson, Clearfield Creek travels 43 miles in a northward direction through the northeastern portion of Cambria County and the central portion of Clearfield County before joining the West Branch of the Susquehanna River in Clearfield. Clearfield Creek collects 40 tributaries, and is classified as a warm water fishery. The headwaters, located in Cresson Cambria County, are narrow and remotely shallow with pebble to small boulders before passing into Ashville, Cambria County, where the creek widens and accumulates larger cobble stone to even large boulders. Shrubs throughout its length extensively shade the riparian area.

*Moshannon Creek* has a length of 22.5 miles, and flows in a northerly direction from its headwaters in northern Blair County to its confluence with the West Branch, just three miles up river from the village of Karthaus. From Phillipsburg to its mouth, 27 miles of the Moshannon Creek are classified as a priority 1-A candidate for the Pennsylvania Scenic Rivers System. The Centre County Natural Inventory described that there are a number of Conservation Areas throughout the watershed. They are Black Moshannon Watershed, Six Mile Run Watershed, Black Bear Watershed, Cold Stream Watershed from U.S. Route 322 bridge to its source, Trout Run Watershed from Montola to its source, and Mountain Branch Watershed from Tim Root to its source. The riparian area is steep and forested with lowland shrubbery near creek side.

*Chest Creek* has a length of 25 miles and flows through Cambria and Clearfield Counties. The headwaters of Chest Creek begin just south of Bradley Junction. From

there, the creek flows northward through Clearfield County to its confluence with the West Branch of the Susquehanna in the town of Mahaffey. Eighteen miles of the creek from the headwaters to the Cambria-Clearfield County line, are classified as a Class II candidate for the Pennsylvania Scenic Rivers System. The creek substrate has a composition of shale, limestone, and sandstone from pebble to moderate boulder. The riparian area is steep in spots with shrubs being dominant in the headwaters, but forested through most of Clearfield County.

*Anderson Creek* has a length of 11 miles, and flows southward from the headwaters in Pine Township to the confluence in Curwensville. The city of Dubois has a 210 acre water supply reservoir on the upstream portion of the creek. This is the Dubois Reservoir, and it is a public water supply. This upstream portion of the watershed, from the reservoir to its source, is classified as a Conservation Area (DER 1979a). From its source to the reservoir, Anderson Creek is classified as a high quality cold water fishery. The rest of the creek is classified as a cold water fishery, due mainly to the mine drainage problems. The creek substrate is composed of boulder and gravel, which is coated with iron precipitate. The riparian area is very steep and shaded by shrubs and trees.

*Little Clearfield Creek* has a length of 18 miles, and is formed by the confluence of Watts Creek and Gazzam Run near the town of Kerrmorr, Clearfield County. From this confluence the creek flows northeasterly to where it meets with Clearfield Creek near the town of Dimeling, Clearfield County and is classified as a Priority III candidate for the Pennsylvania Scenic Rivers System. The creek is classified as a high quality cold waters fishery. The creek substrate is mainly rubble and the riparian area is shrubs and trees.

#### **D. POPULATION**

The Upper West Branch Watershed watershed drains 30 boroughs. The larger towns in the basin include Clearfield, Curwensville, Northern Cambria, Philipsburg, Patton, Hastings, Cresson and Gallitzin. Lawrence, in Clearfield County, and Cambria in Cambria County are the largest of the 45 townships in the watershed. The study area is mainly rural, populated by small communities and few cities throughout Cambria, Centre, Clearfield and Indiana Counties.

SEE TABLE B

#### **E. LAND USE**

The approximate acreage of the study area is 656,000 acres, most of which is found in Clearfield county (71%). The vast majority of land,66%, is forested with about 10-12% each for urban development and mining/wetlands. Agriculture accounts for about 9% of the land. Nearly 100,000 acres of mined land in the watershed makes this area one of the most extensively surface mined areas in the country. Most of the urban development can be found in the boroughs of Northern Cambria, Clearfield, Curwensville and Philipsburg.

SEE LAND COVER MAP M-8

Of the forested land, 9% is public, managed by the Pennsylvania Game Commission for wildlife, Department of Conservation and Natural Resources (DCNR) as state forest or state park, and the U.S. Army Corps of Engineers for flood protection.

Seven State Game Lands in the area comprise approximately 29,000 acres. The largest of these public lands is State Game Land 108 in northern Cambria County. This 15,000 acre tract borders Prince Gallitzin State Park on the southwest, south, and southeast sides. It also encompasses Clearfield Creek between the villages of Dean and Van Ormer extending to the Blair County border.

Cambria County's Prince Gallitzin State Park, operated by DCNR, covers 6,249 acres, of which 1,600 acres comprise the waters of Lake Glendale.

In the study area forest lands managed by the Bureau of Forestry are limited to two small tracts of the Moshannon State Forest near Rockton and Chestnut Grove.

Curwensville Lake, constructed in 1965, is one of four reservoirs in the West Branch Susquehanna River flood control system. The dam and gates are operated by the U.S. Army Corps of Engineers. The recreational aspect at the site, including boating and swimming, are under management of the Clearfield County Municipal Services and Recreation Authority.

(ALL ABOVE ARE DISCUSSED IN FURTHER DETAIL IN RECREATION)

## **F. EMPLOYMENT**

In the Upper West Branch Susquehanna River area coal mining remains an important employer although at drastically reduced numbers. Surface mining sites can be found by the dozens here. From the 1880's to the early 1990's underground coal miners made up about 30% of the employment rolls. Today, the mining of bituminous coal using drift mouths and shafts is all but gone.

In northern Cambria County the Precision Production Craft/Repair and Technical Sales/ Administrative Support categories are the top employment categories. The Unemployment Rate in 2000 was 4.9%.

Clearfield County's three major employers located in the watershed are Wal-Mart Associates Inc., Pennsylvania State Government, and Clearfield Hospital. In October, 2000 the unemployment rate was 5.9%.

About 2,800 people reside in the northeastern portion of Indiana County included in this study. The top occupations of the working sector here are Operator/Laborer and Management/Professional. The unemployment rate for the entire county in December, 2000 was 6.6%.



## **G. TRANSPORTATION**

The area of Cambria, Clearfield, Centre and Indiana Counties included in this plan are served by several major highways and hundreds of secondary roads. U.S. Interstate 80 bisects Clearfield County from east to west. U.S. Route 219 follows the general route of the West Branch from Carrolltown to Grampian. PA. Routes 36, 879, 286 and 969 are the remaining major arteries serving the area. Numerous highway bridge crossings can be found on the river and its tributaries ranging from single lane secondary road bridges to large 2 or 3 lane spans.

Rail freight traffic has been declining for many years. R.J. Corman Railroad is the remaining active rail concern in the area. This railroad's "Clearfield Cluster" has trackage in Indiana County leading to the main track at Cherry Tree that proceeds through Clearfield County. Corman's rolling stock can be found on all active secondary sidings in the three counties. Coal and freight remain the chief traffic on the railroad.

## **II. COMMUNITY RESOURCES**

### **A. RECREATION**

The Upper West Branch of the Susquehanna River contains several canoe access points both public and private along with several miles of Class I and Class II water. At present the following public boat access points are in operation: McGees Mills Covered Bridge, Mahaffey, Lumber City, Curwensville Lake, Irwin Park-Curwensville, North Witmer Park-Clearfield, Shawville, Deer Creek, Karthaus. The deep hollows and canyons along with the winding characteristics make the Upper West Branch Susquehanna River one of the most scenic waterways in the state. Canoeists are in agreement that the breath taking section of river near the Clearfield – Karthaus area is unrivaled in beauty and serenity. According to the Route 219 Corridor Feasibility Study (The EADS Group, 1990) several sections of the West Branch were federally identified as being eligible for wild and scenic status.

The West Branch study area lies within the proposed Lumber Heritage Region of Pennsylvania, the newest of the state's 11 Heritage Regions. The region, consisting of all or part of 14 counties, will showcase and preserve the state's rich and colorful lumbering history along with the contemporary hardwood products industry.

The Vision Statement of this entity reads as follows: *"The Lumber Heritage Region is an internationally recognized forest community with a sense of pride in our people, our quality of life, and the traditions of our rural heritage. Our sustainable forest is a destination that continues to provide unique opportunities for forest product manufacturing, education, research, and recreation. Linking forests, parks, historic resources, and communities allows residents and visitors to explore our vibrant culture and contribute to a vital economy."*

One important project of the Lumber Heritage Region is the West Branch Water Trail. (See map in following section). This river pathway begins at Cherry Tree and meets the North Branch at Northumberland. Approximately 40 % of the trail's 240 miles lies in the Upper West Branch Study Area. A detailed map will be available for canoeists and road travelers alike featuring the historic river and the role it played in the development of the region by serving as a transportation route for the early timbering era.

Besides including private and public canoe launch areas, the Water Trail map features the "Rafting Points" used by pilots of timber rafts from the 1830's to around 1906. These points (189 of them) served as milestones along the river. They were used to warn pilot and crew of dangerous rocks, sharp curves and other unusual features in the river. "Rocky Bend", "Sheeps Pen", "Big Stepping Stones" and "Wood Rock" are a few of the interesting names given to these points. On the page borders of the map a continuous narrative can be followed giving the canoeist, traveler or reader a guided tour through history and along the river.

A number of Rails to Trails can be found in the study area. The Clearfield-Grampian Trail parallels the West Branch for 10 miles. The Snow Shoe Cluster includes 7 miles of proposed trail from Wallacetown to Winburne, and the Snow Shoe Trail includes 19 miles of undeveloped trail from Winburne to Clarence. The Western Pennsylvania Conservancy, on behalf of Moshannon State Forest, purchased a portion of corridor between Moshannon Creek and the rail trail in order to provide access to a popular canoe segment of the stream. A rail trail presently in the planning stages is the Prince Gallitzin to Black Moshannon State Park trail, if the project proceeds as planned it will cover about 60 miles. Other proposed trails include the Houtzdale Line and the Dimeling to Madera Trail.

Three streams and one dam in the area have received special status from the Pennsylvania Fish and Boat Commission. Small sections of Chest Creek and Little Clearfield Creek are classed as Delayed Harvest, Artificial Lures Only. Such designations usually indicate stream areas have sufficient aquatic life and water quality to permit species such as trout to live in the waterway for a longer than normal period than other waterways permit.

There are five reservoirs/lakes in the study area, and four are open to public use. Of those, Glendale Dam at Prince Gallitzin State Park in Cambria County, is the largest. The 1,600 acre lake with its 26 mile shoreline has 8 access points, two marina slips, boat mooring and launch available. The Fish and Boat Commission classifies Glendale as a warm water fishery with species such as bass, northern pike, muskellunge, crappie bluegill and perch. The two major feeder streams to the dam, Killbuck Run and Beaverdam Run are stocked with trout.

Curwensville Lake, in Clearfield County, covers 790 acres and is classified as a warm water fishery. It is a flood control dam operated by the U.S. Army Corps of Engineers. The recreational aspect of the lake, camping, swimming and boat launch, is the responsibility of Clearfield County Municipal Services and Recreation Authority.

Janesville Dam is located at Mountz Memorial Park in south central Clearfield County. Gulich Township operated the park and lake.

The DuBois Reservoir consists of 210 acres and is located on Anderson Creek. It is closed to the public and serves as the water supply for the city of DuBois.

Two popular State Parks are located in the study area. Prince Gallitzin State Park, located in the Clearfield Creek watershed in northern Cambria County, is, as mentioned above, of considerable size and offers a great deal of activities for the user. Attendance at the park has averaged around 1.5 million people per year. At the parks' Glendale Lake boating, swimming, fishing and other water sports are available to the public. The park provides picnic and camping facilities, trails for hiking and exercise, cross country skiing, and trails for horseback riding. Activity at the park does not come to an end in the winter. Many visitors enjoy ice boating, ice skating and ice fishing. Sledding and tobogganing are also popular winter activities with over 4 acres of slopes in the Main Marina area. Over 3,000 acres of the park are open to hunting. Ten modern rental cabins are available for year round use. An environmental education specialist offers programs spring through autumn. Prince Gallitzin's 437 site campground consistently receives the largest number of campers of all the parks in the state.

Black Moshannon State Park, in Centre County, also offers many recreational opportunities. Located in the Moshannon Creek Watershed, annual usage ranges around 1 million visitors. The park offers swimming, boating, fishing, camping and hiking.

In addition to these outdoor attractions, this area of Pennsylvania is host to hundreds of thousands of hunters every year in search of large and small game, and an equal amount of anglers enjoying the many miles of fishing streams. SEE WATER USE TABLE D.

## **A. HISTORICAL**

### **WATERSHED HISTORY**

The name "Susquehanna" is derived from the Native American word for "long, crooked river". Even at headwaters the small stream snakes through dozens of bends and turns except where man has created flood projects that have straightened out the ancient path. As with most Pennsylvania rivers, the majority of documented Indian sites were located along the stream where a splashing tributary converges with it. A major Indian village was once located at the Mouth of Moshannon Creek. The only permanent Indian town in Clearfield County, called Chinklacamoose, was located near present day Clearfield. It was inhabited by the Leni – Lenape, or Delaware Indians, as the English called them. The village was burned and deserted in the 1750's.

The earliest public highways in these counties were waterways. In Cambria County, the first of these was the West Branch, declared a public highway in all its navigable branches by Section 1, Act of March 9, 1771.

## THE TIMBER BOOM

When the first white settlers arrived in the headwaters area, they found a vast wilderness of huge timber many centuries old. This majestic tract covered the hills and valleys along the river the entire distance to Karthaus and beyond. The Chest Creek and Clearfield Creek areas contained similar stands of virgin White Pine and Hemlock with a scattering of hardwoods. A number of the more enterprising pioneers wasted no time beginning to harvest these virgin trees. In the years from 1835 to 1895 the West Branch was the scene of a lumbering era never before or since witnessed. It is estimated that during this time period 100 billion board feet of lumber floated down the West Branch to markets at Lock Haven, Williamsport, and tidewater at Chesapeake Bay. It is the Upper West Branch watershed that contributed a tremendous amount of logs to this total. The hillsides and valleys of this area once contained the most valuable stands of White Pine in the eastern United States. These majestic trees were carefully felled, transported to ports such as Baltimore and used as masts or spars on Clipper Ships all over the world. The West Branch was the scene of thousands of log drives and also was a major rafting river. These timber rafts, comprised of logs coupled together by lash poles, bows and pins were the actual product; being dismantled and sold when they reached their destination. With a cook shanty in the middle and a 50 foot "oar" at each end, these 125 feet long and 28 feet wide crafts were a remarkable site. Five or six strong men at each oar, taking commands from the pilot, steered these huge crafts through the rocks and bends of the river. The headwaters of the West Branch, from the harvesting of important timber products to the extraction of high quality coal, have contributed greatly to the building of our state and nation. (See Water Trail Map following page eight. )

*In 2000, a healthy mixed hardwoods forest can be found where the majestic White Pine and Hemlock giants once dominated.*

## KING COAL AND THE RAILROAD

In the late 1880's as the timber resource was being exhausted, woodsmen began to notice outcroppings of bituminous coal along the hillsides and ravines where they were working. It did not take long for this coal, sometimes called "Black Diamonds", to become the next commodity of value along the West Branch. Openings referred to as "Drift Mouths" or "Shafts" began to spring up rapidly to begin mining of this coal. From these early times until the early 1990's coal mining was the major occupation of the region. It was this industry that sustained the population, and prompted the villages and boroughs to flourish. Ironically, coal mining also was the first source of pollution to enter the pristine headwaters. In the beginning acid mine drainage was an accepted by-product of coal mining. Naturally, the operators of these pioneer collieries are, for the most part, all gone and cannot be held responsible for the *detrimental discharges* still seeping into the waters. Mining operations of today must abide by State and Federal regulations in the treating of mine drainage.

Railroads and the West Branch of the Susquehanna River continue to share a narrow corridor through the mountains of the study area. In fact, one of the small headsprings of the river actually flows out of the railroad tunnel near Carrolltown. The laying of track to bring the railroad to the early coal mines mentioned above was a very important step in the

process. Perhaps more importantly, this track laying was instrumental in the inevitable settling of towns and boroughs along the West Branch. So, as the river became quiet with the demise of the log drives and rafting era, the Iron Horse steam locomotive began filling the air with its sounds of progress within a few dozen feet of the old water highway. In the year 2001, one can still witness trains traveling the route at a very diminished number. After the coal mines shut down the rails and ties from Carrolltown to Cherry Tree and dozens of other small communities were unceremoniously removed.

## **HISTORIC PLACES AND SITES**

### *McGEES MILLS COVERED BRIDGE*

This bridge over the West Branch at McGees Mills is the only covered bridge crossing the Susquehanna River and the only one still being used in Clearfield County. The 122-foot span was built in 1873 by Thomas A. McGee, a son of the town's founder, Reverend James McGee. During the thaw of the winter of 1873, floodwaters rushed downstream and the bridge became one of its casualties. The county commissioners appropriated \$1,500 to repair the structure, but Mr. McGee, a lumberman, spent just \$175 of the amount to repair the arch-truss type span. This type of bridge style was patented in 1804 by Theodore Burr, the famous early bridge builder. In 1976 the bridge was closed for renovations and reopened in 1978. It was placed on the National Register of Historic Places with dedication ceremonies being held on May 15, 1982. On March 14, 1994, mother nature again created havoc in the area. During this record breaking ice and snow storm, the roof of the span collapsed. After 19 months of renovations the bridge was rededicated on October 11, 1995. This scenic spot remains one of the most popular photograph taking attractions in Clearfield and surrounding counties.

### *THE KITTANNING PATH*

An Indian trail dating from the early 1700's, this 120 mile path extended from the waters of the Juniata River near Huntingdon west to the Allegheny River at Kittanning. A 40 mile section of the trail once traversed Cambria and Indiana Counties crossing the West Branch at the intersection of U.S. Route 219 and Main Street in the village of Emeigh. Today, an untouched section of the trail remains as a visitors' stop near Eckenrode's Mill in East Carroll Township.

### *THE CHERRY TREE MONUMENT*

This monument marks the spot of a wild cherry tree that once stood at the corner of land purchased by the William Penn heirs from the Iroquois Indians at the Treaty of Fort Stanwix, New York, in 1768. This granite obelisk was erected in 1894 and today also denotes the corners of Cambria, Clearfield, and Indiana Counties. The area was once called Canoe Place, being the upstream limit of the river where canoes could be paddled to. It was here that the

ancient water travelers portaged their goods and crafts overland to the Allegheny River at Kittanning.

#### *RAFTSMEN'S MEMORIAL*

Located across the road from the Cherry Tree Monument is the Raftsmen's Memorial, dedicated in 1958. Mr R. Dudley Tonkin, local author and historian son of pioneer lumberman Vincent Tonkin, composed the words found on the granite stone:

*All that on earth do dwell,  
Speak softly-Tread lightly,  
To honor the raftsmen-the loggers  
Their mothers and wives  
Of Penns Woods  
Carry on*

#### *BILGERS ROCKS*

This unique geological phenomenon is located near Grampian in Bloom Township, Clearfield County. These rocks are estimated to be 320 million years old. The thickness of the entire sandstone unit in this area of the county measures about 50 feet thick and the outcrop at Bilger's Rocks is described as a single bed, measuring 20 to 25 feet thick. The various openings and passageways were formed through the years by weathering, frost action, water and ice. The area was named for Jacob Bilger who owned the site in the latter half of the 1800's. The Bilger's Rocks Association currently owns and cares for the 175 acre tract. The group was formed in March 1988 and with grants, donations and fundraisers purchased the property. The first Family Day was held July 7, 1990. An annual event is the successful Haunted Hayride, where spooks and spirits, also known as local civic groups and families create realistic scenes that challenge the travelers.

#### *CLEARFIELD HISTORIC DISTRICT*

The Clearfield Old Town Historic District consists of a four block area along Front Street from Pine Street to just beyond Walnut Street. This area was chosen for placement on the National Register of Historic Places because it contains a large concentration of well-made Victorian homes mostly built from 1840 through 1890. The majority of these structures are in unaltered condition and all are on their original sites.

#### *COALPORT HISTORIC DISTRICT*

The Coalport Historic District was placed on the National Register of Historic Places by virtue of its significance in the areas of commerce and architecture. Fifty three structures comprise the historic district which is located on Main Street and bordered at the south by Walnut Street and the north by Mill Street. Clearfield Creek meanders through the town a few hundred feet west of the district. Before the railroads came to town lumber and coal was rafted down this stream to market. It was this mode of transportation of coal from a "port" on the river that effected the name Coalport.

In the early days Coalport was a bustling community, with two railroads, the Pennsylvania & Northwestern and the Cresson & Irvona, serving the town. The Cambria Smokeless Mine was the first large colliery to locate in the borough. The reason for the name “Smokeless” for the mine remains unexplained. Several older citizens of town concur that coal from this mine smoked as much, when burned, as coal from any other mine.

Coalport provides an excellent example of turn-of-the-century vernacular boomtown architecture in this area of the state. Many of its original buildings are extant in spite of early fires. Some of Coalport’s buildings such as Bell’s Drug Store and McNulty’s Hardware (still operated by the fourth generation of the same family) are well preserved and reflect a strong continuity of use.

After World War Two, business activity in town began to slow down. The closing of a major employer, the Sunshine Coal Tipple, in 1970 caused the boroughs slow decline to intensify. Today, a small, thriving business community continues to exist on Coalport’s Main Street.

### **III. WATER RESOURCES**

#### **A. WATER QUALITY**

Over the last 40 years numerous studies of the water quality of the Upper West Branch have been undertaken. Agencies involved in these projects include: The Pennsylvania Fish & Boat Commission, PA Department of Environmental Protection, including the Bureaus of Mining and Reclamation, Water Quality Protection, and Watershed Conservation. More recently, the Susquehanna River Basin Commission, United States Department of the Interior, and the Cambria and Clearfield Conservation Districts (Tables 1 –5, Pages 16A – 16I) have completed studies here. Perhaps the most well known assessments are the Operation Scarlift Reports prepared by consultants for the Department of Environmental Resources in the early 1970’s. Four of these reports were completed for tributaries in the study area. They are Anderson Creek (SL101.6), Clearfield and Moshannon Creeks (SL101.7), Muddy Run (SL155), and the West Branch (SL163-3).

The former GPU Generation Corporation, now Reliant Energy, has been monitoring sites along the river and its tributaries as part of the Shawville Power Plant’s permit. Reports include insect, algae, fish and chemical parameter indicators.

The Pennsylvania Fish and Boat Commission has performed numerous aquatic assessments through the years.

Tables 1 through 5, pages 16A – 16I provide a summary of the water quality of the Upper West Branch of the Susquehanna River ending in 1997. These tables correspond with MAPS 2-7 at front of plan. For reasons unknown, several degrading sources of water pollution above or south of DATA POINT WB –15 were ignored in this table. Among these sources is the Barnes- Watkins Coal Refuse Pile near Bakerton. (In the Issues and Concerns - Public Meeting section of this plan you will find the removal of this refuse pile is included on the list of priority projects suggested by citizens.) Also, in reference to the Table 1 narrative: The Barnes & Tucker Mine mentioned is in fact the former Barnes & Tucker #15 Mine at Bakerton. In 1970, a major breakout of polluted water occurred in this area which eventually killed all aquatic life downstream to the Curwensville Dam. Since this time the breakout has been harnessed and is being pumped from the worked out mine to a water treatment plant near Duman's Dam near Nicktown. After the water is treated here it is discharged into the Blacklick Creek Watershed.

*The Water Quality and Biological Survey Of the West Branch Susquehanna River* (SRBC 1985, Publication 92) provides very good documentation for water quality and biological conditions. TABLES FROM THIS REPORT CAN BE FOUND in APPENDIX A

As of January, 2001 a Headwaters AMD Assessment and Restoration Plan Development Project of the upper 12 miles of the West Branch from Carrolltown to Cherry Tree is underway. The project is a result of a grant provided by DEP's Growing Greener Program. The West Branch Susquehanna Rescue Group of Northern Cambria is the grant sponsor and the subcontractor for the project is VAPCO Engineering of Punxsutawney, PA. Approximately 450 historic samples will be compiled into summary report tables for 53 separate discharges or stream samples. Additional samples will be collected where information is lacking. When completed in October, 2001 this project will provide the latest water sample results and restoration plans for the upper reach of the river. .

The Cambria County Conservation District was awarded a \$60,000 Growing Greener Grant to complete a watershed assessment on Clearfield Creek. Phase I will include the headwaters to the Schoff Mine near Irvona in Clearfield County. The purpose of the project is to complete a detailed restoration plan for the watershed. Remediation plans will be developed to address all sources of pollution. The Clearfield County Conservation District will complete Phase II of the project from Irvona to the Creek's confluence with the West Branch at Clearfield.

## CONSERVATION AREAS

There are six Conservation Areas located on Moshannon Creek:

1. Black Moshannon Creek Watershed
2. Six Mile Run Watershed
3. Black Bear Run Watershed
4. Cold Stream Watershed from U.S. 322 bridge to its source



5. Trout Run Watershed from Montola Dam to its source
6. Mountain Branch Watershed from Trim Root Run to its source

Despite the wide spread degradation caused by acid mine drainage, many sections of the West Branch have shown great improvement over conditions of 25 years ago. The reach of river between McGees Mills and Clearfield has improved from a point where aquatic life was absent to being able to support populations of game fish and waterfowl. The reach upstream of McGees Mills has shown improvements in biological condition and water quality, although serious problems still exist. Chest Creek, a popular fishing stream, continues to show improvement. The positive strides listed above are largely due to the regulation of existing coal mines and the reclamation of abandoned underground and surface mines. Also, the construction of municipal sewage treatment plants, especially the system that came on line in the Barnesboro, Spangler area in 1996, has contributed greatly to improving water conditions downstream.

The most important factor affecting water quality in the West Branch Susquehanna River is acid mine drainage (SRBC 1994). Acidity is the chemical parameter which is most detrimental to the water quality of the West Branch. Acidic compounds are toxic to aquatic life when present in high concentrations. But these compounds also have combined effects with other dissolved metals causing severe mortality to aquatic organisms. High acidity is a problem in almost every reach of the West Branch where water quality problems exist. Acidity treatment in the West Branch would have a very beneficial impact on the water quality. In addition to removing the high acidity, such remediation would also reduce the high levels of many other pollutants.

#### *Main Branch*

Near the headwaters at Bakerton, low alkalinity, high conductivity and concentrations of dissolved solids, calcium, sulfate and aluminum, were the highest observed in the West Branch. The dozens of AMD sites and the Barnes-Watkins refuse pile in this area are the reason for these detrimental numbers.

The tributaries to the West Branch have a great impact on the water quality of the river. Several major tributaries are badly degraded by acid mine drainage and have adverse impact on the river. Other tributaries are alkaline and have a beneficial impact on the West Branch. A number of other streams have excellent water quality but don't contribute enough flow to show improvement to the river.

#### *Clearfield Creek*

Table 4 indicates the water quality in Clearfield Creek is fair in the headwaters near Ashville, but the stream is degraded by acid mine drainage as it flows downstream. This

degradation occurs despite contributions of good and excellent quality water from Beaverdam Run, North Witmer Run, and Little Clearfield Creek. Water quality is very poor at its confluence with the West Branch. Clearfield Creek is a major tributary and constitutes half the total flow of the river at this point. The creek has a major impact on the water quality of the river. Water quality data collected by GPU Generation Corporation, in 1995, showed the impacts of Clearfield Creek on the river with levels of iron manganese, aluminum, and dissolved solids, higher than found in the main stem. However, alkalinity levels were greater than zero and the lowest pH recorded at its mouth was 5.98. Cresson Shaft is the largest discharge in the headwaters above Ashville. Brubaker Run can be identified as the first significant contributor of AMD to Clearfield Creek located in the village of Dean on U.S. Route 53. The combination of Muddy Run and the Shoff Mine Blowout upstream of Madera, with loading from White Oak and the Brookwood Shaft, are the greatest contributors within the watershed. Conditions are further degraded from the contribution of Japling Run, Lost Run, Pine Run, and several discharges located along both banks of the stream. Below Dimeling, the tributaries of Krebs Run, Long Run, Roaring Run, and an unnamed tributary, all adversely affect Clearfield Creek and are tied to discharges associated with the Sky Haven Coal /Penn State Site.

#### *Little Clearfield Creek*

Little Clearfield Creek's water quality is generally very good and supports a healthy biological community; however, chemical conditions are not ideal. Sulfate and fecal strep counts exceed Commonwealth standards (SRBC 1985). In 1997, 26 sites were field-tested. Several tributaries were found to exceed pH and alkalinity standards (Warner, 1997). It is believed that acid rain may be the cause of these reductions. The pH of rainfall for this area is 4.1 (Arway, 1997). If the tributaries with lower pH values have poor buffering capabilities, acid rain could be the cause. Warner recommends that these tributaries be tested for iron, aluminum, and manganese. Additional coliform tests should be performed as well.

#### *Moshannon Creek*

Acid mine drainage has been found to be the most significant source of pollution in the Moshannon Creek Watershed (Bortnyk 1997). Iron precipitate is the most prevalent problem. The precipitate covering stream bottoms creates an unsuitable environment for aquatic life. The high levels of metals present makes the water unsuitable for drinking. The headwaters of Moshannon Creek have relatively good water quality (Merrow 1996). Bortnyk, who focused on the middle section of Moshannon Creek, found the pH for this section was 7 and the apparent good water quality is deceiving. Several large discharges are currently being treated at the Rosemary Job and Rushton Mine Complex. Wastewater treatment discharges from the plants in Houtzdale and Philipsburg may be masking effects.

#### *Anderson Creek*

The headwaters of Anderson Creek are high quality and provide a public water supply for the City of DuBois. However, acid mine drainage originating from abandoned

clay mines in Rock Run and Little Anderson Creek Watersheds severely degrade the water quality. Kratzer Run had been shown to adversely impact the stream (DER, 1979a, Gwin Engineers, 1974). However, a central sewage treatment plant, constructed in 1993 for the villages of Grampian and Stronich, may be influencing water quality results over previous studies. Water samples collected in the spring and summer of 1997 show Rock Run and Little Anderson Creek having major impacts. Little Anderson Creek's flow is substantial and is a major contributor to the main stream's reduced quality. The pH of Little Anderson Creek is 3.7 (Young 1997). At the confluence of Anderson Creek and the West Branch, aquatic life is absent and water quality is poor.

### *Chest Creek*

Chest Creek has good water quality and healthy biological conditions. Some problems occur due to organic pollution and siltation, but there are no large negative impacts due to mine drainage. Its good water quality has a beneficial affect on the West Branch. Sixty sites were field tested during the summer of 1997 (Warner, 1997). The pH values for the stream and all the tributaries were within Commonwealth standards. Dissolved oxygen levels in many parts of the stream and several tributaries were low. This may be due to the influence of sewage from the municipalities in the area of Patton, Westover, and (La Jose) Newburg. SEE APPENDIX B FOR FURTHER TRIBUTARY STUDIES

## **B. WATER SUPPLY**

Residents within the study area utilize ground water produced from either dug or drilled wells or surface water from public water systems operated by private companies and public authorities from streams or reservoirs. Both Counties measure water use differently. Clearfield County measures its use by housing units, and Cambria County measures according to gallons used per year.

The Cambria County Redevelopment Authority authorized the *Cambria County Water Supply and Wellhead Protection Program*. The Pennsylvania Department of Resources Technical Assistance Center for Small Water Systems and Cambria County funded the study.

According to the program, within the study area of this report, more than 586 million gallons of water were used by approximately 16,000 people and by the one million-plus visitors to Prince Gallitzin State Park.

In the West Branch Susquehanna River, Cambria County, study area, surface water usage accounts for 285.4 million gallons per year (GPY). Several sources are located in the watershed, including 11 reservoirs and two intakes from Chest Creek and Laurel Run. Ground water usage accounts for 228 million GPY, and mine water accounts for 72.6 million GPY. Chest Creek does have some acid mine drainage that contaminates the supplies. Also, the Carrolltown Borough Municipal Authority Reservoir has had some sewage problems in the past.

Clearfield County's statistics were provided from the County Planning Office Data Book. The majority of usage within the study area in the County was from public systems and private companies. Seventy-one percent of the housing units utilize water from these sources.

Ground water, in the form of dug or drilled wells, accounted for 19.4%. Pennsylvania American Water utilizes ground water to supply Philipsburg and the surrounding communities. Other uses accounted for 9.4%.

Cooper Township has a water supply on Black Bear Run, a tributary to Moshannon Creek.

In Clearfield County, public water supplies are located in several areas. DuBois, Curwensville, and Pike Township use Anderson Creek, by collecting surface water in reservoirs.

Communities along the Main Branch use various sources for water supply. Burnside Borough collects ground water from a spring. Mahaffey uses ground water from a well system. Westover collects surface water in a reservoir on Rogues Harbor Run. Clearfield collects surface water in a reservoir on Montgomery Run.

On Clearfield Creek, ground water from a spring in Moshannon Creek is used by the Clearfield Municipal and Recreation Authority to supply Coalport. Glenn Hope uses ground water as a source from a spring. SEE TABLE C - EXISTING DAMS AND RESERVOIRS

## **C. GROUND WATER**

Currently, there are no state or federal monitoring programs of the groundwater in the study area, and there are no groundwater protection programs implemented.

The major groundwater contaminant in the watershed is acid mine drainage. Individual septic systems and those maintained by small municipalities are a secondary cause.

Agricultural activities, landfills, and industrial facilities are limited enough to not be of major concern.

Several townships and municipalities in Clearfield County do not participate in the Act 537 Sewage Facilities Plan. Townships: Bloom, Chest and Graham. Municipalities: Burnside, Chester Hill, Clearfield, Glen Hope, Houtzdale, Lumber City, Mahaffey, New Washington, La Jose and Westover. (Gordon, 1998)

## **IV. NON POINT POLLUTION SOURCES**

### **A. AGRICULTURE**

Pollution from agriculture is very limited within the study area. There are 412 farms within the affected area in Clearfield and Cambria Counties, which account for just 48,660 acres. Of that acreage, nearly 5,000 acres are used as pasture and 200 for orchards or tree farms. The other 43,476 acres have been classified as cropland and hayland.

Livestock operations include dairy, cattle/beef, swine, sheep and poultry. Within the study area, there are no high-intensity operations with major impact on the watershed. There are 26 management plans in place in the study area. For Cambria County, 90% of the farms within the study area are utilizing conservation plans. In Clearfield County, 44%, or 7,313 acres of cropland, is currently being managed according to conservation plans.

There are over 10,000 feet of stream bank fencing in Cambria County. In Clearfield County, there is no documentation of stream bank fencing practices. The United States Department of Agriculture office does recognize a few problem areas that have a visible impact.

Farmland Security programs are active in both Clearfield and Cambria Counties. Cambria County has 4 agricultural security areas in 4 Townships (Allegheny, East Carroll, Barr and Clearfield). There are 162 farms, with 18,000 acres, involved. Cambria County has initiated a farmland preservation programs in the study area.

According to Marty Shirey, the Pesticide Inspector for the State Department of Agriculture, there are no problems within the study area.

### **B. URBAN**

Overall, there is very little development on the West Branch. Where the West Branch flows through the Boroughs of Curwensville and Clearfield, there are areas for industrial and commercial development.

In the Clearfield area, there are 3 construction areas. The first surrounds Clearfield County's Multi-Service Center, where an office complex is being built and Lock Haven University is building a new branch campus. The second is the Clearfield Area School District building a new grade school on Mount Joy Road.

Storm water problems occur in the Clearfield area, Mahaffey, Patton, Hoare's Run, and Dinkey Run, where occasional basement-type flooding occurs.

Phase I (Act 167) scope of the study has been completed for the Chest Creek Drainage.

According to Alex Graziani, Clearfield County Planning Director, the storm water management facilities are antiquated, and there is no planning by the local government. In 1997, the County did complete Phase I of Act 167 planning, but will not begin Phase II in the foreseeable future due to limited resources.

### C. RESOURCE EXTRACTION

Coal mining is the primary method of resource extraction in the study area. Hundreds of surface and deep mines in the study area have led to the amount of acid mine drainage problems in the watershed. There are still approximately three dozen active coal mining operations in the study area.

Gas and oil production is limited within the study area. There is no oil production but there are 2 major gas fields (EAPS, 1989). The Rockton field is classed as a deep producer, with well depths from 6,500 to 7,500 feet. The Troutville field is a shallow producer, with depths from 2,500 to 3,500 feet.

### D. SEPTIC SYSTEMS

Septic systems are the predominate method for treating wastewater in the Upper West Branch of the Susquehanna River. Table 3 provides an overview that nearly every municipality includes on-lot systems as the primary plan for sewage facilities.

**Table 3**

#### **Act 537 Sewage Facilities Plan & Wastewater Utilities**

**Clearfield County: Information Source, “1998 Clearfield County Municipal Handbook**

<u>Municipality</u>	<u>Act 537 Plan/Date</u>	<u>Sewer Utility</u>
Beccaria	Yes – 1989 & 1996	On-Lot/BCI Sewage Authority
Bell	Yes – 1973	On-Lot/Mahaffey Municipal Auth.
Bigler	Yes – 1996	On-Lot
Boggs	Yes – No Date	On-Lot
Brisbin Borough	Yes – No Date	Brisbin Sewer Authority
Burnside Borough	No	On-Lot

<u>Municipality</u>	<u>Act 537 Plan/Date</u>	<u>Sewer Utility</u>
Burnside	Yes – No Date	On-Lot
Chest	No	On-Lot
Chester Hill Borough Coalport Borough	No Yes – No Date	Moshannon Valley Joint Sewer Auth . BCI Municipal Authority
Cooper	Yes – No Date	On-Lot
Curwensville Borough	Yes – 1966	Curwensville Municipal Authority
Decatur	Yes – No Date	On-Lot/Moshannon Valley Joint Sewer Authority
Ferguson	No	On-Lot
Glen Hope Borough	No	On-Lot
Grampian Borough	Yes – 1990	Grampian Borough Sewer System
Greenwood	Yes – No Date	On-Lot
Gulich	Yes – 1996	On-Lot
Houtzdale Borough	No	Houtzdale Sewer Authority
Irvona Borough	Yes – No Date	BCI Municipal Authority
Jordan	Yes – No Date	On-Lot
Knox	Yes – 1968	On-Lot
Lawrence	Yes – 1996	On-Lot/Clearfield Municipal Authority
Lumber City Borough	No	On-Lot
Mahaffey	No	Mahaffey Municipal Authority
Newburg/LaJose	No	On-Lot
New Washington	No	On-Lot

<u>Municipality</u>	<u>Act 537 Plan Date</u>	<u>Sewer Utility</u>
Osceola Mills Boro	Yes – 1997	System (No Treatment Plant)
Penn	Yes – No Date	On-Lot/Penn Township Sewage
Pike	Yes – 1996	On-Lot/Curwensville Municipal Authority
Ramey Borough	Yes – 1996	On-Lot
Wallaceton Borough	Yes – No Date	On-Lot
Westover Borough	No	On-Lot
Woodward	Yes – 1994	On-Lot/Woodward Township Sewer & Water Authority

**Indiana County: Information Source, Indiana County Municipal Service Authority**

Green	Yes – 1997	On-Lot/Green Township Municipal Authority
Montgomery	No*	On-Lot
Banks	No*	On-Lot
Glen Campbell Boro.	No*	On-Lot

**Cambria County: Information Source, Cambria Co. Comprehensive Water and Sewer Plan**

Susquehanna Twp.	Yes-1970-1991	West Branch Sewer Authority On-Lot, Wildcat, Direct Discharges
Elder Township	Yes-1970	Hastings Area Sewer Auth. On-Lot, Wildcat, Direct Discharges
Chest Township	Yes-1970	On-Lot, Wildcat, Direct Discharges



<u>Municipality</u>	<u>Act 537 Plan Date</u>	<u>Sewer Utility</u>
White Township	Yes-1970	Glendale Year Round Sewer Co. On-Lot, Wildcat, Direct Discharges
Reade Township	Yes-1970	On-Lot, Wildcat, Direct Discharges
No. Cambria Boro	Yes-1970-1991	West Branch Sewer Authority
Hastings Borough	Yes-1970-1997	Hastings Area Sewer Authority
Patton Borough	Yes-1970	Patton Municipal Authority
Barr Township	Yes-1970-1991	West Branch Sewer Authority On-Lot, Wildcat, Direct Discharges
West Carroll Twp.	Yes-1970-1991	West Branch Sewer Authority On-Lot, Wildcat, Direct Discharges
Carrolltown Boro	Yes-1970	Carrolltown Boro Municipal Auth.
Clearfield Twp.	Yes-1970	On-Lot, Wildcat, Direct Discharges
East Carroll Twp.	Yes-1970	Carrolltown Boro Municipal Auth. On-Lot, Wildcat, Direct Discharges
Allegheny Twp.	Yes-1970	On-Lot, Wildcat, Direct Discharges
Chest Springs Boro	Yes-1970	On-Lot, Wildcat, Direct Discharges
Loretto Borough	Yes-1970	Loretto Borough Sewer Department
Dean Twp.	Yes-1970	On-Lot, Wildcat, Direct Discharges
Ashville Boro	Yes-1970	Ashville Borough Sewer Department
Gallitzin Twp.	Yes-1970	Gallitzin Borough Sewer Department
Gallitzin Borough	Yes-1970	Gallitzin Borough Sewer Department

Cambria Township	Yes-1970	Cambria Township Sewer Authority On-Lot, Wildcat, Direct Discharges
Cresson Township	Yes-1970	Cresson Township Municipal Auth. On-Lot, Wildcat, Direct Discharges

In Centre County, Philipsburg Borough has an Act 537 Plan approved in 1989 through the Philipsburg Borough Sewer Department. Rush Township Sewer Authority's Act 537 Plan was approved in 1991.

The lack of adequate soils for natural renovation limits the ability of on-lot septic systems to function properly. The assessment was not able to adequately assess the impact of malfunctioning systems due to the overwhelming impact of acidic mine drainage and the absence of primary treatment facilities in small towns where untreated sewage is discharged directly into the river from combined sewage and storm water systems constructed decades ago.

**E. OTHER SOURCES**

Timber Harvesting and the primary processing of hardwood lumber are an active part of the local economy in the study area. The area has a rich history of logging. The watershed is included in Pennsylvania's Lumber Heritage Park. There are many second and third generation operators in the region. Cambria County is 60% forested and Clearfield 70%. The cutting of the trees does not create erosion and sedimentation problems. The creation of roads and log landings can accelerate erosion if not done properly. The latest "National Water Quality Inventory" reports that forestry activities contribute to approximately 90% of the water quality problems in surveyed rivers and streams nationwide. Sources of sediment pollution include removal of streamside vegetation, road construction and use, and mechanical preparation for the planting of trees (a southern and western practice). Road construction and road use are the primary sources of non-point source pollution contributing up to 90% of the total sediment from timber harvesting operations. Cutting of trees in the area beside a stream can elevate water temperature and destabilize stream banks. These changes can have a negative effect on aquatic life by limiting shade, food, and shelter.

The two Conservation Districts involved with this study have recognized both the economic importance of the forest industry and the impacts that this industry can have on the environment. Both County Board of Directors have a sawmill owner as a Director. Fortunately, they are graduate foresters too. They understand forest ecology, silviculture and the nature of the logging industry with regard to the extraction of trees from the forest and what it takes to get the logs to the mill.

The Cambria County Conservation District developed the first Erosion and Sediment Pollution Control Manual for Timber Harvesting almost 30 years ago. Today, the “Action Packet” used by the forest industry across PA still contains many of the same principles of the original manual. Joint Workshops have been conducted, in cooperation with the forest industry, to educate the logger as to the latest and most effective best management practices (BMP’s) that work in the region. The Tree Farm Program and the Forest Stewardship Program are also active parts of the Conservation District’s program goals. Landowners have a responsibility for forest activities on their property too. The two programs promote many BMP’s to assist landowners in making sound management choices for their woodlot.

## **V. EDUCATION AND PUBLIC PARTICIPATION**

### **A. SCHOOLS**

Obviously, public support is critical to all river conservation plans. A great deal of progress has been made in this area in the last 5 or 6 years. Generally, the public will respond to calls for volunteers if a sound organization with strong leadership approaches them. The list of watershed groups has been growing with the increased concern for the environment.

Schools throughout the study area are generally environmentally conscious. Curricula now include, beside basic sciences, environmental studies. Many schools participate in competitive environthons where skills and knowledge are tested and rewarded in the field.

Two public high schools in the watershed, Moshannon Valley and Curwensville Area, have incorporated the study of the watersheds into environmental courses. Moshannon Valley High School, with teacher Tom Marcinko, has developed an exemplary program that is receiving statewide attention. Marcinko and students at the school have studied local streams since 1991. They have flow meters installed on Mongan Run, Little Muddy Run, Beaver Run, Clearfield Creek, Six Mile Run, Black Bear Run and Red Moshannon Creek. These projects have been focused to involving students in the value of monitoring and the use of data for aiding in critical decision making. Marcinko has secured grants from the Department of Environmental Protection, the Chesapeake Bay Watershed Education Foundation, Wal-Mart, Penelec, and Headwaters Charitable Trust, to incorporate locally pertinent issues into his curriculum. Marcinko was named the Clearfield County Conservation District “Teacher of the Year” in the last few years for his efforts. He was also named the Moshannon Valley Economic Development Partnership “Person of the Year” and was a finalist for the Walt Disney “Teacher of the Year” award.

## **B. ORGANIZATIONS**

The Chest Creek Watershed Association in Patton has recently expanded to become the Chest Creek Watershed Alliance Inc. Through a Growing Greener Grant and the Cambria County Conservation District the group has been conducting public meetings to increase awareness and interest in the association. An informational kiosk is planned for placement on the flood control levee in Patton. The Association and the Patton Trout Nursery recently received a grant for stream bank restoration on Chest Creek.

The West Branch Susquehanna Rescue (WBSR) group in Northern Cambria was organized in 1994. The group maintains a membership of around 100 individuals, families and businesses. River cleanups in the headwater section from Carrolltown to Cherry Tree in the last three years have been very successful. The 1998 cleanup included 125 volunteers, 1999-206 people and last year 200 people participated in the Saturday project. Nearly 20 tons of trash have been hauled to the landfill, and some 250 tires delivered to the recycling yard. The group was awarded the Cambria County Conservation Award in 1998 and the state Conservation District Association award in 1999. Presently, the WBSR is in the midst of a river assessment project of the first 12 miles of stream made possible by a Growing Greener Grant (to be completed in October 2001). The spring of 2001 will also see the group beginning a streambank improvement project on Walnut Run in Northern Cambria, also sponsored by a Growing Greener Project Grant.

Presently, a watershed group is being formed for the Clearfield Creek area. The Cambria County Conservation District was awarded a \$5,000 Growing Greener Grant to assist in the formation of the Clearfield Creek Watershed Association. This funding will enable the group to acquire IRS 501 (c) (3) designation and function on its own. Members of the Watershed Association will collect water quality data and become an integral part in the restoration of their watershed. The watershed association will conduct a river cleanup in 2001.

The Anderson Creek Watershed Association was formed to promote the restoration and enhancement of the natural resources within Anderson Creek Watershed. This mission will be accomplished by educating the public, promoting the wise use of resources, encouraging the partnerships necessary to restore and conserve water quality and quantities and by securing the technical and financial resources to meet this challenge. The Association is organized exclusively for charitable and educational purposes including the making of distributions to organizations that qualify as exempt organizations under section 501 (c) (3) of the Internal Revenue Code, or corresponding section of any future federal tax code.

The Little Clearfield Creek Watershed Association, based in Ollanta, has a membership of more than 100 and was set up to preserve and enhance the water quality of that stream.

A \$5,000 Western Pennsylvania Coalition for Abandoned Mine Reclamation was awarded to the Emigh Run/Lakeside Watershed Association. The funding will be used to purchase water testing equipment, apply for a corporation charter and a 501 (c) (3) designation. Early projects of the organization include a park and fishing area at Morrisdale Dam and a water assessment project on Emigh Run.

The West Branch Sportsmens Club presently has 115 members. Present projects include water assessments on Hubler Run and Alder Run.

## **VI. ISSUES AND CONCERNS**

### **A. PUBLIC MEETING RESULTS**

These town meetings provided the opportunity for local residents to learn about public assessment and gave them a chance to provide suggestions for establishing a restoration program.

Meetings were held at Gearhartsville, Karthaus, Curwensville, Clearfield and Burnside – all in Clearfield County. In Cambria County, public input was gathered at Dysart and Patton and in Indiana County at Glen Campbell.

*The following issues and concerns are those raised by the public and are not the result of scientific or environmental studies.*

### **WATER QUALITY**

- A. Acid mine drainage (AMD), the number one concern at all meetings, is ruining our river. Efforts should be stepped up to remediate these pollution points. The state and federal authorities should take better care when issuing new surface and underground permits.
- B. Wild Cat sewage systems affects water quality. Residents in the rural areas are at a disadvantage with no chance to “hook up” to a municipal sewage system. A lot of the older rural systems have gone bad.
- C. Runoff from dirt roads and pastures. The poorer townships think it is actually funny to think that all of their dirt roads should be paved.
- D. Trash in and along streams was one of the top five issues discussed. The rural population attending the meetings took pride in attempting to keep the waterways near their homes clear of trash.
- E. Available potable water. Is anyone monitoring our ground water with all the surface mining and gas well drilling going on here? Water is a necessity, and we must protect our sources.
- F. Erosion at Eckenrode Mill Dam and along stream banks of Chest Creek and The West Branch.
- G. Stream encroachment by well drillers and some loggers has gone unchecked in areas.

- H. Flooding at Anderson Creek in Curwensville. Can steps be taken to begin a flood control project here?
- I. Flood plain development-flood control. Some of the small towns have no room left for development except on the flat areas near waterways. Is there some way to get flood control levies in these areas so small industry can possibly set up here?
- J. Restore fisheries. The Patton Trout Club project is leading the way with their work on Chest Creek.
- K. Support local project on Mosquito Creek.
- L. Mine Pools, can they be used eventually for potable water, who is monitoring these pools?
- M. The West Branch is most impacted by pollution between Shawville and Karthaus. It was brought up that according to some reports state that the first 10 miles of the river is the most adversely impacted by AMD.
- N. Prioritize AMD effected streams.
- O. Utilize volunteers. The organizations that now exist and conduct river cleanups were mentioned and noted. People at the meetings were encouraged to join these groups or start their own groups for their neighborhood streams section.
- P. Need concrete follow up efforts, don't let all this time and effort fall by the wayside.
- Q. Integrate DEP mining permit data.
- R. Information needed on the latest technology for on-lot sewage.
- S. Mine refuse piles and run-off pollution.
- T. Land owner input needed. Inform those that live around these potential projects of what is going on.
- U. Nutrient Management - at the time of these meetings this program was relatively new but interest was shown concerning it.
- V. Remove AMD pollution from Cold Stream Run.
- W. Increase efforts to eliminate or minimize the devastating effects of the Barnes-Watkins coal refuse pile in Bakerton on the headwaters of the West Branch.

## **CULTURE AND HERITAGE**

- A. Indian settlements and trails in the counties. We should preserve existing information and perhaps research these treasures more fully.
- B. Historical information about the river and its tributaries should be expanded upon and made available to the public. We have a lot of important history here.
- C. Preserve our fascinating rafting and logging heritage on the West Branch.
- D. Inaccessibility helps preserve beauty.
- E. Preserve wild areas and trails.
- F. Promote public awareness of problems and opportunities along the river.
- G. Education – possibly expand into the schools a short study of the river in a Geography or History class.
- H. Protect small farms.

- I. Request the local timber industries to assist in educating the public that not all timbering and lumber companies are bad. Show how many people are actually employed by the timber industry in the three counties.
- J. Expand upon the information the Rorabaugh family has on the lumbering industry.
- K. Charles Schwab stone dam on Laurel Run.
- L. Coke Ovens near Frugality.
- M. Eliminate sprawl by permitting green zones within towns to make them more attractive.
- N. Enhance quality of life in the small communities and townships along the stream and its tributaries.

### ***RECREATION***

- A. Improve fishing and canoeing opportunities.
- B. Explore white water rafting opportunities.
- C. Publicize and support existing Rails to Trails, support construction of new trails.
- D. Protect public hunting.
- E. Convert brownfield sites to fishing and recreation.
- F. Promote wild trout streams.
- G. Support outdoor sports activities.
- H. Support the proposed Lumber Heritage Region of Pennsylvania. The West Branch is an important part of this region and a water trail is being developed for canoeists along the river.
- I. Add and improve existing canoe access points along the river.
- J. Enhance the area around the McGees Mills Covered Bridge.
- K. Creekside development at Scout Park near Mahaffey.
- L. Develop a combined heritage/recreation development at the Last Raft site near the old Charlie McGee farm near McGees Mills along Susquehanna Road.
- M. Research and ascertain who is responsible for portaging canoeists around Shawville Power Plant Dam.

### ***NATURAL RESOURCES***

- A. Preserve our wildlife/waterfowl resource, promote co-existence with them.
- B. Monitor public access to wild areas or natural resources. Watch for abuses of the resource and a need to improve access or limit access.
- C. Acquisition of more land for public use.

### ***OTHER***

- A. Request time on County Commissioner and Township Supervisors meeting agendas to present our case.
- B. Identify watersheds, waterways, dams and wetlands that may be improved during construction of the Route 322 section of Corridor O.

## **B. SUMMARY**

### *WATER QUALITY*

After compiling the comments from the public meetings it is clear that Acid Mine Drainage is the Number One priority in the minds of local citizens. The next two concerns go hand in hand with water improvement; increase efforts to reduce wildcat septic systems and restore fisheries. Flood plain development control was brought up at several meetings. Efforts should be stepped up to recruit and organize volunteers for water and embankment cleanups, along with stepped up enforcement of the law dealing with stream encroachment by loggers and well drillers.

At the time of these meetings Nutrient Management was relatively new but much interest was expressed in this process. Interest was shown in another relatively new aspect- the concern with runoff from dirt roads and pastures.

### *CULTURE AND HERITAGE*

This category of the meeting results is secondary to the water quality subject, but nevertheless, it was made clear by the participants that culture and heritage advancement and preservation were very important. People living along the river and its tributaries are very proud of their neighborhoods and their heritage, along with the colorful history and geography of the region.

Indian trails and sites of old settlements should be further researched and preserved. The fascinating rafting and logging history on the waters here should be compiled and made available to the public. A partnership should be struck with the numerous timber manufacturing concerns in the area to educate the public as to how conscientious logging practices benefit all involved. Our local small farms must be taken care of, along with enhancing the quality of life in our small communities.

It was suggested that a program could be introduced to local schools that would expose students to the river, past and present. It was acknowledged that such a project takes careful planning, and a great deal of input from the administration and faculty of these schools. Coinciding with this school project could also be a video oral history project where students could help preserve actual memories while learning history.

Containment of sprawl and preserving our small farms and communities was spoken of numerous times.

### *RECREATION & NATURAL RESOURCES*

Most of the comments concerning recreation and natural resources were directly related to the first category dealing with water quality. All recreational use along the river



hinges directly on water appearance, condition and accessibility. Suggestions made at more than one meeting include: improving and protecting fishing, hunting and canoeing activity here is important, improve advertising of existing Rail Trails, and increase efforts to establish new trails, enhance the area around the McGees Mills Covered Bridge, develop the creekside at the Scout Park near Mahaffey.

A number of meeting attendees suggested a plan to determine the feasibility of developing the site where The Last Raft was constructed in 1938 on the old Charlie McGees farm near McGees Mills. This timber raft is the focus of one of the most colorful and intriguing true stories on the West Branch. This project was undertaken to commemorate the logging and rafting days (1830-1890) on the river. It was a great history lesson for the thousands that witnessed the journey from McGees Mills to Harrisburg. Unfortunately, the odyssey ended in disaster near Muncy where the raft collided with a bridge pier and seven people were drowned.

Unanimous support was given to the Lumber Heritage Region Plan and its project “The West Branch Water Trail” (Chapter II A). It was agreed that the plan area would benefit directly from any successes of this new Pennsylvania State Heritage Park.

The preserving and policing of existing wild areas, and reporting abuses is needed. More public land should be required along streams to allow user access.

#### *OTHER*

Attempts should be stepped up to have this plan put on the agenda of local and county officials. Officials must be kept informed of the progress of the project.

*Please refer to Table F “Implementation Strategies Table” in the Appendices section for further details of the concerns and potential projects suggested in the public meeting round.*

## **VII. REMEDIATION PLAN**

### **A. SUMMARY**

The restoration of the waters and streambanks of the Upper West Branch Susquehanna River is a monumental task that will require new institutional arrangements among local communities, with state and federal agencies. The recommended plan is simply the first step. *Please refer to the “Implementation Strategies Table” in the Appendices and Tables Section.*

As can be seen in Chapter VI., A. Issues and Concerns, a common thread does exist between the different areas, but there are also concerns and suggestions unique to each community. The importance of involving each of these communities in the development of this plan is very crucial to establishing a base of support for requesting the technical and financial support needed to begin implementation.

The plan should be implemented as a series of actions occurring simultaneously. The initial demonstration projects that are recommended should be funded at the same time that detailed watershed level analysis begins. This provides the people from the local communities in the watershed to experience first hand the type of restoration methods to be used elsewhere in the watershed. This enables each local community to determine the best use of these technologies for their particular circumstances. This strategy offers the opportunity for collaboration among many agencies and the private sector to reach a comprehensive restoration.

The plan incorporates a new approach to watershed planning and restoration.

First, the plan establishes the use of biological monitoring to assess non point source control effectiveness. By monitoring aquatic life as the primary indicator of overall water quality, the use of quantitative methods can become a tool for assessing the relative impacts of untreated and severely polluted reaches of the river.

Secondly, the plan recommends that the limited resources available for addressing mine drainage be directed toward specific demonstration projects and the design of complex treatment facilities that are needed before restoration can be successful. The plan builds upon previous studies by recognizing the continuing need for complex treatment facilities on Clearfield Creek.

Thirdly, the plan recognizes the role of a healthy mining industry. The industry is both a source of employment where existing coal reserves can be removed as part of this plan as well as a source of revenue from the excise tax on coal. New methods of analyzing overburden and special handling of toxic material can be incorporated into these mining operations thus preventing any future discharge problems.

Lastly, the plan is presented as a work in progress. There remain significant analyses to be performed throughout the entire watershed. There is more data to be collected from the hundreds of sites where non point sources emanate. This new data should be used in developing detailed watershed by watershed plans. There is a need to establish a series of two new monitoring stations at Madera on Clearfield Creek and at Barnesboro on the main reach in addition to the nine existing USGS stations so that the cumulative impact of the many changes occurring throughout the watershed, including the treatment of point sources of pollution and new sources, can be accurately reported.

The control of all non-point pollution sources in the Upper West Branch Susquehanna River is a complicated problem that this plan does not attempt to address in terms of financial needs. The construction of the five complex treatment facilities is estimated to be in excess of \$10,000,000. These facilities will address only 30% of the total metal loading in the watershed and yet are probably the most cost effective areas to start.

Appendix A outlines the funding opportunities for citizens and their governmental agencies to utilize for this purpose. Initiating such a monumental task requires a constant

championing of the task by citizens from all walks of life. Working through local community organizations and quite possibly new organizations focused to educating the general public, informing elected officials, and advocating the use of effective techniques, people will need to reach agreement on the progress as time moves along. There is no model for watershed restoration that fits the Upper West Branch of the Susquehanna to emulate. There are many examples of groups and coordinated watershed projects that have made significant and long lasting impacts. There is support for the effort by the broad-based infrastructure supporting the Chesapeake Bay Program. There are significant opportunities to link this restoration program with economic development and community development to provide affordable housing, sustainable businesses such as outdoor recreation, and the myriad of opportunities that clean water offers these communities. The out-migration of the work force and entrepreneurial training of a changing workforce are all new frontiers for this region.

## B. GOALS

The Upper West Branch of the Susquehanna is a region where severe land and water degradation is a result of past industrial practices, natural resource extraction, and historic small town development along the river. Damage includes contaminated streams and ground water, acidified streams and rivers, sewage in surface waters, and soil erosion. To correct these effects of human practices on the natural world, we need to collectively use public programs in a way that directly results in changing the use of the river to restore and protect land and water. Comprehensive approaches led by the communities within the watershed are an effective strategy for working with public agencies and private landowners.

The goal to restore the Upper West Branch of the Susquehanna River is to restore a sustainable aquatic system throughout its entire length. Restoring aquatic life within a clearly defined segment provides for a pool of organisms that can regenerate themselves as an energy source for higher organisms that eventually restores fish and ultimately other uses for humans such as drinking water.

The following sections outline the goals for each segment of the entire Upper West Branch of the Susquehanna River.

## C. ACTION ITEMS

Rehabilitating an entire watershed over time takes the effective coordination of public programs and working with ongoing land activities. Pennsylvania has adopted a comprehensive strategy for reclamation that provides an excellent framework for use in this watershed. Ongoing regulatory programs that monitor point source discharges will have an impact to the overall attainment of the goals for the non-point source pollutants in the river.

Sustainable restoration is at the heart of every modern environmental program. It represents the synthesis of environmental improvements that can achieve long term goals.

At the core of every sustainable approach is to restore a natural regeneration of flora and fauna. Public programs and private actions will need to be measured by a yardstick that uses the relative ability of a stream to regenerate its aquatic life as a measurement of success. There is strong evidence that biological monitoring provides a consistent method for assessing environmental improvements. The rapid changes in the aquatic system from pollutants can be measured long after acute events and more subtle incidences of non-point influences are evidenced by changes in population dynamics.

The proposed action plan provides a stream-by-stream approach that builds upon systematically restoring aquatic life in the entire West Branch of the Susquehanna River.

The action plan outlines high priority projects that serve to stimulate community involvement while achieving an impact to improve water quality.

This initial start action list is summarized in Table 10. Initial funding should be sought to:

Complete detailed hydrogeologic analyses on several complex areas.

Complete detailed flow and quality analyses of specific discharges as well as develop specific site-by-site conceptual designs for remediation.

Design and install several restorative projects that will have a high degree for success and create an immediate in-stream improvement.

## ANDERSON CREEK

The Anderson Creek segment from the source to the DuBois Reservoir is high quality. The City of DuBois uses the stream as a source of drinking water.

The segment from below the reservoir to the confluence with Little Anderson Creek is only diminished by temperature during the late summer.

The next segment from Little Anderson Creek to Kratzer Run is severely degraded by acid mine discharges from deep mine sites concentrated around the Chestnut Grove community. Historic deep mining left larger discharges in the segment south of Rt. 153 and above the confluence with Kratzer Run. Treatment must address both the acidity and dissolved metals in the discharges. Treating these discharges would restore the entire length of Anderson Creek.

The remaining segment from the confluence of Kratzer Run to the mouth of Anderson Creek is impaired by sewage. The new wastewater facility at Grampian is correcting a significant portion of Kratzer Run.

A detailed comprehensive water analysis of the existing mine discharges is the first step.

## CHEST CREEK

Chest Creek is the only tributary where agricultural activities have made a noticeable influence to water quality.

Nitrates and suspended sediments impair the segment from the source near Chest Falls to the confluence with Rouges Harbor. Historically, surface mining and tillage for row crops have contributed to the bedload of Chest Creek. The diminished presence of surface mining and the installation of best management practices, including the conversion of row crops to forage, will address these impairments and restore Chest Creek as a very significant high quality stream.

The segment from Westover to LaJose receives significant loading from untreated sewage. Public programs such as PENNVEST can make a significant contribution to improving this segment. The low-income communities can ill afford traditional treatment systems. Less capital intensive and simpler maintenance systems need to be demonstrated in these communities.

## CLEARFIELD CREEK

Clearfield Creek provides the most significant degradation to the entire river. The initial segment, from the source to the confluence with Brubaker Run, is of high quality. The installation of best management practices on farms and the continued use of practical on-lot sewage systems can maintain this quality.

Treating sites in Brubaker Run can restore the segment from this point to the confluence with Muddy Run. The planned sewage treatment in Coalport and Irvona will further aid in restoring this entire segment. The significant addition of high quality water from several tributaries, such as Witmer Run and Cofman Run, all provide for sustaining a viable population of aquatic life by providing for escape areas during unexpected malfunctions or spills.

The segment from Muddy Run to the confluence with Little Clearfield Creek is the most important segment to restoring the river. A major project in the Muddy Run tributary must be designed and implemented. Despite 20 years of daylighting activities by active mining, the White Oak, Shoff, and Brookwood mine openings remain as serious sources of pollution. Treatment methods that can significantly and consistently reduce acidity need to be built and maintained at 3 locations. Successful restoration of the stream segment in Clearfield Creek is possible. The low gradient of Muddy Run can be exploited to settle limestone and provide for a longer benefit from lime addition. The steeper gradient of Clearfield Creek provides for more scouring and further dissolution of lime material. The use of natural and constructed wetlands for treating large discharges has not been consistently demonstrated to be an effective method for area

discharges as large as these have become. The topography along Muddy Run offers the opportunity to demonstrate and evaluate a large wetland system. The segment from Little Clearfield Creek to the confluence with the river provides for significant restoration should the Muddy Run project become reality. Minor additions from Long Run add little to diminish the improvements provided by Little Clearfield Creek.

The first step is a detailed hydrologic and water quality analyses needed to address the White Oak, Shoff, and Brookwood mine discharges.

## MOSHANNON CREEK

Moshannon Creek can be restored by carefully remediating several key tributaries in the upper reaches.

Raup Run impacts the upper Moshannon until the confluence of Whiteside Run. Additional acidity emanates from Mountain Branch.

Completion of restoration projects on Raup Run, Mountain Branch, and Whiteside Run, will restore aquatic life throughout the upper and mid-regions of Moshannon Creek.

Laurel Run degrades the Moshannon Creek at Philipsburg. Thomas (1998) found several smaller discharges that collectively could be treated to restore Laurel Run.

As you move to the lower reaches of Moshannon Creek, there is a significant loading from several tributaries, including Sulfur Run, Wolf Run, Grassflat Run, Weber Run, Hawk Run, and Emigh Run. The recommended actions include a hydrogeologic analysis of several deep mining complexes in this reach to identify alternative methods for directing these flows to locations where treatment can be effectively completed.

Although the lower reach is a complex and significant task and should be a lower priority, this reach is the beginning of one of the longest undeveloped landscapes in the entire Chesapeake Bay watershed. Restoration of this reach will have a major impact on the main river from Karthaus to Lock Haven.

## MAIN BRANCH

The Upper West Branch of the Susquehanna River, from the source to the confluence with Cush Cushion Creek, is the most important segment assessed in this study. Actually, as stated in Chapter III A- Water Quality, the first 10 miles from headwaters to near Cherry Tree are the most polluted in the reach. The 14 plus mine discharges in the Bakerton - Northern Cambria area along with the Barnes – Watkins refuse pile need to be recognized, studied and dealt with. Sewage pollutants in Burnside and along Cush Cushion Creek can be addressed by demonstrating alternative methods for small

communities through PENNVEST or similar publicly supported funding. The topography of this segment offers excellent wetland treatment potential for small community systems.

The segment from Cush Cushion Creek to Bell Run is in excellent condition and addressing upstream influences will eliminate the impairment in this segment. The proper maintenance of the wastewater treatment system at Mahaffey is critical to maintaining this segment.

The segment from Bell Run to the Curwensville Lake has small discharges that can be effectively treated by passive methods. Each tributary can quickly be restored by installing these relatively low-cost, low-maintenance systems. The segment from Curwensville Lake to establishing riparian areas, the elimination of free access by cattle, and the elimination of untreated sewage along Montgomery Run and Moose Creek. Anderson Creek is heavily developed, and riparian restoration would provide important improvements.

Anderson Creek to Clearfield Creek was not assessed in the report. Historical data exists that indicates the restoration of this segment could be influenced by establishing riparian areas, the elimination of free access by cattle, and the elimination of untreated sewage along Montgomery Run and Moose Creek.

#### D. BUDGET

The overall estimate to restore the entire Upper West Branch of the Susquehanna River using currently accepted techniques for treatment could exceed \$100,000,000. (This amount does not include the \$6 Million recently projected as being required to remove the Barnes-Watkins Refuse Pile.) The initial plan recommended is estimated to be \$10,300,000. The annual cost for technical assistance simply to reach out to the public and work with landowners is \$175,000. Restoration of tributaries and 110 miles of the river to a quality capable of supporting a cold water fishery provides \$170,000,000 in benefits using angler days as an economic value. This provides both the means and opportunity to restore an entire bioregion to a healthy condition. Costs are estimated (1998) based on local experience. Large complex discharges are very difficult to estimate until detailed designs are completed based on long-term flow and quality analyses.

*Please refer to Table F “Implementation Strategies Table” for further details of the areas of concerns highlighted in this chapter.*

**Table 6**

Non Point Source Pollution Control Plan for the Anderson Creek Watershed				
Reach	Source	Control Methods - Projects	Costs	Priority
Little Anderson Creek Chestnut Grove	Mine discharge sites	Passive treatment- Design & construct one system	\$300,000	High
Kratzer Run	Mine discharge sites, on lot sewage	Passive treatment; On lot treatment- Design & construct one system	\$25,000	High
Little Anderson Creek Korb mine	Mine discharge sites	Passive treatment		
Little Anderson Creek Draucker mine	Mine discharge sites	Passive treatment- Design complex treatment facility	\$300,000	High
Little Anderson Creek Entire	Mine discharge sites All	Passive treatment Annual technical assistance for watershed outreach & technical assistance	\$25,000	High
Entire	Mine discharges	Detailed site-by-site restoration plan	\$100,000	High

**Table 7**

Non Point Source Pollution Control Plan for the Chest Creek Watershed				
Reach	Source	Control Methods – Projects	Costs	Priority
Chest Creek- Source to Westover	Agriculture	Best Management Practices	\$300,000	High
Chest Creek Westover to Mahaffey	Domestic wastewater	Passive treatment- Design one small community system & management system	\$800,000	High
Entire	All	Annual technical assistance for watershed outreach & technical assistance	\$25,000	High
Entire	All	Detailed site by site watershed plan	\$100,000	High



**Table 8**

Non Point Source Pollution Control Plan for the Clearfield Creek Watershed				
Reach	Source	Control Methods - Projects	Costs	Priority
Cresson Lake	Mine discharge sites	Passive treatment- Design & construct one system	\$300,000	High
Brubaker Run	Mine discharge sites	Passive treatment- Design & construct one system	\$300,000	High
Dysert Borehole	Mine discharge sites	Passive treatment		
Powell Run	Mine discharge sites	Passive treatment		
Turner Run	Mine discharge sites	Passive treatment		
Blue Run at Madera	Mine discharge sites	Passive treatment		
Shoff mine at Madera	Mine discharge sites	Design complex treatment facility; Construct as demonstration	\$400,000 \$3,500,000	High
Muddy Run White Oak mine	Mine discharge sites	Design complex treatment facility, repair stream bottom, re mine coal reserves	\$750,000	High
Japling-Mid Penn Brookwood mine				
Muddy Run 29 shaft at Beccaria	Mine discharge sites	Design complex treatment facility	\$200,000	High
Potts Run	Mine Discharges	Passive treatment		
Pine Run		Re mine coal reserves, passive treatment		
Upper Morgan Run	Mine discharge sites	Passive treatment		
Morgan Run	Mine discharge sites	Complex treatment- Design Passmore clay mine	\$200,000	High
Camp Run	Mine discharge sites	Passive treatment		
Roaring Run	Mine discharge sites	Alkaline addition		
Long Run		Passive treatment, Alkaline addition- Design & construct stream length	\$150,000	High
Entire	All	Annual technical assistance for watershed outreach & technical assistance	\$75,000	High
Entire	Mine discharges	Detailed site-by-site restoration plan	\$750,000	High

**Table 9**

## Non Point Source Pollution Control Plan for the Moshannon Creek Watershed

Reach	Source	Control Methods –Initial Project	Costs	Priority
Raup Run	Mine discharge sites	Passive treatment- Design & construct one system	\$300,000	High
Mountain Branch-lower Trout Run	Mine discharge sites	Alkaline addition		
Little Beaver Run	Mine discharge sites	Passive treatment		
Coal Run	Mine discharge sites	Passive treatment		
Laurel Run Little Laurel Run	Mine discharge sites	Passive treatment- Design & construct one system	\$300,000	High
Shimmel Run	Mine discharge sites	Passive treatment, Alkaline addition		
Emigh Run	Mine discharge sites	Passive treatment		
Coldstream Run	Mine discharge sites	Passive treatment- Design & construct one system	\$300,000	High
Hawk Run	Mine discharge sites	Comprehensive Hydrogeologic Analysis, design complex treatment facility, re mine coal reserves	\$200,000	High
Sulfur Run	Mine discharge sites	Comprehensive Hydrogeologic Analysis, complex treatment facility, re mine coal reserves	\$200,000	High
One Mile Wolf Run	Mine discharge sites	Passive treatment		
Ames Run	Mine discharge sites	Passive treatment		
Entire	All	Annual technical assistance for watershed outreach & technical assistance	\$50,000	High
Entire	Mine discharges	Detailed site-by-site restoration plan	\$750,000	High

**Table 10**

Non Point Source Pollution Control Plan for the Upper West Branch Susquehanna River Watershed Executive Summary High Priority Projects				
Reach	Source	Control Methods - Projects	Costs	Priority
Chest Creek	Agriculture, domestic wastewater	Best Management Practices, technical assistance; design small community systems	\$1,200,000	High
Clearfield Creek	Mine discharges	Passive treatment; design complex treatment facilities	\$6,575,000	High
Anderson Creek	Mine discharges	Passive treatment, design complex treatment facility	\$725,000	High
Moshannon Creek	Mine discharges, domestic wastewater	Passive treatment; design complex treatment facilities	\$1,800,000	High
Entire	All	Annual need for watershed outreach & technical assistance	\$175,000	High
Entire	Mine discharges; agriculture; domestic wastewater	Detailed restoration plan for mine drainage sites in three watersheds; Design & construct 8 demonstration projects; Design 5 complex mine treatment facilities; Design one small community system for domestic wastewater; Complete comprehensive hydrogeologic analysis on two complexes for remining; Continuing technical assistance for agriculture & forestry operations	\$8,755,000	High

**UPPER WEST BRANCH SUSQUEHANNA RIVER CONSERVATION PLAN  
IMPLEMENTATION STRATEGIES**

IMPLEMENTATION STRATEGIES	POTENTIAL PARTNERSHIPS And/or RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	PROJECTED TIME FRAME
<b>WATER RESOURCE CONSERVATION</b>			
1) Enhance and support stream bank improvement projects, water quality improvement projects, and river cleanup activities. Formulate streambank protection plans	Local grassroots organizations, PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, PA Cleanways, Cambria and Clearfield Counties, West Branch Susquehanna Rescue Group, Chest Creek Watershed Assn., Anderson Creek Watershed Assn., Central Counties Concerned Sportsmen	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources	On Going, 1-5 years
2) Increase water quality monitoring activities, add monitoring stations where data is lacking.	Bureau of Abandoned Mines Reclamation, PA DEP, PA Office of Surface Mining, Environmental Engineering Firms in Study Area, West Branch Susquehanna Rescue Group, Anderson Creek Watershed Assn., Chest Creek Watershed Assn., PA Dept. of Conservation and Natural Resources.	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, Rural Abandoned Mines Program	1-3 years
3) Update floodplain area maps within the watershed. Enforce development regulations to protect floodplains.	Municipalities, Cambria and Clearfield County Conservation Districts and Planning Commissions, Federal Emergency Management Agency, U.S. Army Corps of Engineers. Local zoning boards.	County Planning Commissions	1-3 years
4) Update wetland and riparian buffer location maps. Create additional wetlands and riparian buffer areas. Publicize the economic and aesthetic values of these areas.	U.S. Dept. of Agriculture, Natural Resource Conservation Service, PA Dept. of Environmental Protection, County Planning Commissions.	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, U.S. Army Corps of Engineers, private sources	1-3 years
5) Encourage and support existing watershed organizations in the area. Encourage stream cleanups on a regular basis by these groups. Initiate process of forming new groups where gaps exist on stream miles not presently under the care of an organization.	County Conservation Districts, PA Dept. of Conservation and Natural Resources, existing, successful local watershed groups. Municipalities and townships (manpower and equipment)	PA Dept. of Conservation and Natural Resources, private sources	On Going
6) Examine local land use ordinances to assure optimum protection of water quality, stream bank conditions and water sources	Municipalities, planning commissions., watershed groups	No additional costs	1 year
7) Assist the small communities and rural townships in their dealings with businesses expressing interests in creating new landfills in the watershed, provide answers or direction to concerns of citizens dealing with existing landfills	County Conservation Districts, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, County Planning Commissions.	No additional costs	On Going
8) Research and suggest revisions in local municipality and township ordinances to comply with PA Dept. of Environmental Protection's Best Management Practices for Developing Areas.	Municipalities, planning commissions., watershed groups, County Conservation Districts and Planning Commissions	No additional costs	1-2 years
9) Suggest and make available information gathered in this study to appropriate agencies when zoning additions or changes are planned	Municipalities, planning commissions., watershed groups, County Conservation Districts and Planning Commissions	PA Dept. of Conservation and Natural Resources (possibility of no additional costs, depending on availability of copies of the plan)	On Going
10) Continue present efforts and explore additional avenues to facilitate the removal of the Barnes-Watkins Coal Refuse Pile at the West Branch headwaters	Cambria County Conservation and Recreation Authority, RNS Services, Inc., Cambria County Conservation District, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, Western Pennsylvania Commission on Abandoned Mine Reclamation (WPCAMR)	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, Rural Abandoned Mines Program.	On Going
11) Construct passive, onlot treatment systems for approximately 28 mine discharge sites in the study area.	County Conservation Districts, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, County Planning Commissions.	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, Rural Abandoned Mines Program.	1-10 years
12) Provide annual technical assistance for watershed outreach	County Conservation Districts, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection,	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, Rural Abandoned Mines Program.	1-10 years
13) Design complex treatment facility at Shoff Mine at Madera. Construct as a demonstration project.	County Conservation Districts, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, Natural Resource Conservation Service, Western Pennsylvania Coalition on Abandoned Mine Reclamation (WPCAMR)	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, Rural Abandoned Mines Program.	1-5 years
14) Design one small community system for domestic wastewater in each sub watershed	County Conservation Districts, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, Natural Resource Conservation Service, Western Pennsylvania Coalition on Abandoned Mine Reclamation (WPCAMR)	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, WPCAMR, Western PA Coalition of Abandoned Mine Reclamation	1-5 years
15) Assist small municipalities and townships with dealings concerning runoff from dirt roads and pastures, stream encroachment by gas well drillers, and nutrient management	County Conservation Districts, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, Natural Resource Conservation Service	No additional costs	On Going
16) Assist Anderson Creek Watershed group with planning for a flood control project	Clearfield County Conservation District, Federal Emergency Management Agency, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, Natural Resource Conservation Service	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources	1-3 years
17) Anticipate final report of ongoing West Branch Headwaters river assessment due in October 2001. Use these latest numbers to re-assess and reevaluate plan to remediate all or some of the 15+ coal mine drainage sources here	Cambria County Conservation and Recreation Authority, Cambria County Conservation District, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection, Western Pennsylvania Commission on Abandoned Mine Reclamation (WPCAMR)	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources, WPCAMR, Western PA Coalition of Abandoned Mine Reclamation	1-10 years
18) Encourage and assist communities and townships to pursue regional sewage treatment plants	County Conservation Districts, County Planning Commissions, County Community Development Agencies, PA Dept. of Conservation and Natural Resources, PA Dept. of Environmental Protection,	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, PennVest	1-10 years

**UPPER WEST BRANCH SUSQUEHANNA RIVER CONSERVATION PLAN  
IMPLEMENTATION STRATEGIES**

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IMPLEMENTATION STRATEGIES	POTENTIAL PARTNERSHIPS And/or RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	PROJECTED TIME FRAME
<b>BIOLOGICAL RESOURCE CONSERVATION</b>			
1) Preserve our wildlife/waterfowl resource, promote co-existence with them	PA Game Commission, National Fish and Wildlife Service, County Conservation Districts, Sportsman’s Groups, Clearfield Creek Watershed Group West Branch Susquehanna Rescue Group, Chest Creek Coalition, Anderson Creek Watershed Group..	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, National Wildlife Federation, private sources	On Going, 1-5 years
2) Identify threatened and endangered plant species in the watershed.	Western PA Conservancy, PA Game Commission, National Fish and Wildlife Service, County Conservation Districts, Sportsman’s Groups, Clearfield Creek Watershed Group West Branch Susquehanna Rescue Group, Chest Creek Coalition, Anderson Creek Watershed Group..	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources , National Wildlife Federation, private sources	1-3 years
3) Encourage and assist private landowners and developers to establish conservation easements, acquire properties that enhance open space, create riparian buffers	Municipalities, Cambria and Clearfield County Conservation Districts and Planning Commissions, Cambria County Conservation and Recreation Authority, PA Game Commission, National Fish and Wildlife Service, Sportsman’s Groups, Clearfield Creek Watershed Group West Branch Susquehanna Rescue Group, Chest Creek Coalition, Anderson Creek Watershed Group, Natural Resource Conservation Service	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources , National Wildlife Federation, private sources	1-5 years
4) Restore fisheries, assist the Patton Trout Club with their work on Chest Creek, assist all other existing sportsmen with fishing enhancement projects	Municipalities, Cambria and Clearfield County Conservation Districts and Planning Commissions, Cambria County Conservation and Recreation Authority, PA Game Commission, National Fish and Wildlife Service, Sportsman’s Groups, Clearfield Creek Watershed Group West Branch Susquehanna Rescue Group, Chest Creek Coalition, Anderson Creek Watershed Group, Natural Resource Conservation Service	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, U.S.Fish and Wildlife Service, PA Fish and Boat Commission	On Going
5) Continue to monitor fish population on the West Branch in the Burnside and McGees Mills area, access the effects of ongoing upstream cleanup projects	PA Fish and Boat Commission, West Branch Susquehanna Rescue Group, Sportsman’s groups, County Economic Development agencies	PA Fish and Boat Commission, private funding,	On Going
<b>CULTURAL, RECREATIONAL AND EDUCATIONAL RESOURCE CONSERVATION</b>			
1) Educate the public of the importance of watershed resources through school programs and public relations campaigns. Support and assist in furthering school participation in outdoor environthon competitions.	All townships and municipalities, all watershed groups, local school districts, PA Dept of Education, PA Dept. of Community and Economic Development,	Private foundations, businesses, community organizations	1-5 years
2) Identify existing Native American sites and trails, research additional information to locate and document sites. Conduct oral interviews of older citizens concerning river and woodland related history.	Watershed groups, PA Dept. of Education, Pennsylvania Historic and Museum Commission, County Historical Societies, local colleges and schools. The educational community in the region.	PA Historic and Museum Commission, private foundations, landowners	1-5 years
3) Support and continue to be a part of the Lumber Heritage Region, especially the West Branch Water Trail project. Improve canoeing opportunities by partnering further the Water Trail.	All townships and municipalities, all watershed groups, County historical societies, Canoe and adventure clubs, PA Fish and Boat Commission, County Conservation Districts, PA Dept. of Conservation and Natural Resources	PA Dept. of Environmental Protection, PA Dept. of Conservation and Natural Resources, private sources	On Going
4) Enhance and protect existing fisheries on Chest Creek and Cush Cushion Creek along with other quality fisheries	PA Fish and Boat Commission, Natural Resource Conservation Service, Sportsman’s clubs, streamside property owners County conservation districts	PA Fish and Boat Commission, private funding, sportsman’s clubs	On Going
5) Protect and enhance the Clearfield – Grampian Rail Trail, keep an ongoing watch for potential abandoned rail corridors going up for sale or donation.	Local townships and municipalities, Clearfield County Commissioners, Clearfield County Planning Commission., National Rails to Trails Association	PA. Department of Transportation TEA 21 funding, PA Dept. of Conservation and Natural Resources Key 93 Grants, private funding	1-5 years
6) Invite local lumber industries to assist in educating the public to the fact that all lumber operators are not “bad”, and explain their forest management practices	Local timber industries, Conservation Districts, Cambria County Conservation and Recreation Authority, PA Hardwoods Council, Allegheny Hardwood Utilization Group	No additional costs	1-2 years
7) Enhance the area around the McGees Mills covered bridge. Print informational pamphlets which will include the history of this unique structure and surrounding historical settings including old water splash dams and rafting points	PA Historical and Museum Commission, Local Historical Societies, schools and colleges-architectural and historical students and instructors.	PA Historic and Museum Commission, private foundations, landowners	1-5 years
8) Develop a combined heritage/recreation area at Karthaus “straight water”, Mahaffey Scout Park and the McGees Mills site of the construction of the “Last Raft”	PA Historical and Museum Commission, Local Historical Societies, schools and colleges-architectural and historical students and instructors, Lumber Heritage Region Water Trail	Lumber Heritage Region, PA Historic and Museum Commission, private foundations, landowners, PA Fish and Boat Commission	1-5 years
9) Organize and manage a system of agencies to conduct searches and attempt to purchase more land for public use such as rail trails, greenways and nature areas	PA Dept of Conservation and Natural Resources, County Community Development Agencies, County Tax Assessment Offices, County Conservation Districts.	PA Dept of Conservation and Natural Resources, private funding, Sportsman’s groups	1-? years