

**Watershed Restoration Action Strategy (WRAS)  
State Water Plan Subbasin 11A  
Little Juniata River and Frankstown Branch Watersheds  
Blair, Huntingdon, Bedford, Cambria, and Centre Counties**

**Introduction**

The 738-square mile Subbasin 11A consists of two major parts, the 395-square mile Frankstown Branch of the Juniata River watershed and its major tributaries Beaverdam Branch, Blair Gap Run, Canoe Creek, Piney Creek, and Clover Creek, and the 343-square mile Little Juniata River watershed and its major tributaries, Bald Eagle Creek, Sinking Creek, and Spruce Creek. A total of 1,051 streams flow for 1,314 miles through the subbasin. The subbasin is included in **HUC Area 2050302**, Upper Juniata River, a Category I, FY99/2000 Priority watershed under the Unified Watershed Assessment developed by the Department in 1998. The Frankstown Branch and the Little Juniata River join to form the main stem Juniata River at the eastern edge of the subbasin.

Geology/Topography

The topography and geology of the subbasin is varied, as is typical of the Ridge and Valley Ecoregion, which comprises most of the subbasin. This area consists of a series of narrow northeast-southwest trending ridges and steep, narrow valleys formed during the uplift of the Appalachian Mountain chain. Most of the mountains are folded into tight loops and form dead-end valleys. The numerous folds in the mountains result in repetition of rock types throughout the basin, with sandstone-quartzite on the ridges and limestone and shale in the valleys. The steeply sloping topography can lead to increased runoff during storm events and discourage infiltration to the groundwater. The mountains are largely forested; many are state-owned, either as State Game Lands or as State Forest Lands. The Little Juniata River cuts down through the mountain east of the Borough of Tyrone and divides the ridge into Bald Eagle Mountain to the north and Brush Mountain to the south. The Frankstown Branch also cuts through the mountain east of Canoe Creek, forming the divide between Brush Mountain to the north and Lock Mountain to the south. The long, narrow Tussey Mountain forms the eastern subbasin divide.

The ridges are in Northern Sandstone Ridges (67c) subcoregion comprised of weather resistant sandstone and quartzite of the Tuscarora Formation, which often break into boulder-sized rocks that gather as talus on the slopes below the ridges. Most of these slopes are unsuitable for development or farming and are state-owned either by the PA Department of Conservation and Natural Resources (DCNR) (Rothrock State Forest) or by the Pennsylvania Game Commission, in several of their State Game Lands.

Most of the valleys in the eastern two-thirds of the subbasin are composed of limestone strata, part of the Northern Limestone/Dolomite Valleys and Low Rolling Hills subcoregion (67a). This portion has the most productive soils in the subbasin and the bulk of the agricultural land use. The low gradient streams in this limestone region flow through wedge-shaped, flat valleys.

Most of the western third of the subbasin is in the Northern Shale Valleys and Slopes (67b) subcoregion comprised of shale, sandstone and conglomerate. Strata in both 67b and 67c yield very little buffering capacity to the streams flowing through them and many streams on the ridges are naturally acidic and susceptible to acid precipitation.

The Central Appalachians Ecoregion, Forested Hills and Mountains (69a) subcoregion, a small portion of which is along the ridge and upper slope at the Cambria-Blair County line, borders the western edge of the Ridge and Valley Ecoregion. This border is also known as the Allegheny Front. This section contains bituminous coals of the Allegheny and Pottsville Group that were surface and deep mined beginning in the 1800's. Most of these mines have closed but acid mine discharges, abandoned highwalls, and coal refuse piles still remain and degrade many streams originating on the Allegheny Front. Streams originating on the Allegheny Front have very high gradients and flow in a southeasterly direction through steep-sided valleys.

Most of the soils in the subbasin have slow or very slow infiltration rates except for those of the limestone valleys, where sinkholes, depressions and faults result in faster groundwater infiltration.

#### Land Use

The subbasin has a combination of highly urbanized areas in the city of Altoona and suburbs south through the borough of Hoildaysburg, large agriculture areas through the limestone soil zones, and forested areas in the mountains. Industrial and commercial development is concentrated along old US Route 220 and PA 764 through Altoona and neighboring Logan Township. Over 8% of the subbasin was considered as urban in 1990. Altoona was once an important railroad center and staging area for moving goods and people over the Allegheny Mountain to the west. Subbasin population was 145,894 in 1990 and is projected to increase to 172,613 by the year 2040.

Farms are generally concentrated in the limestone valleys. As of 1999, 545 farms totaling 90,000 acres were located in Blair County, which encompasses most of the subbasin. Cattle were reared on 310 farms and dairy cows on 160 farms. The average size farm was 165 acres. Apples are the most important crop in terms of total production, with corn for silage and grain second. The highest valued crops, however, are corn for silage and hay.

Large areas of abandoned surface and underground coal mines remain in the western edge of the subbasin. Numerous limestone, dolomite, shale and sandstone quarries are also present in the subbasin. Machine shops, manufacturing and papermaking are important industries in the subbasin.

#### Natural/Recreational Resources:

Many state-owned forested areas or park lands are located in subbasin 11A:

- Canoe Creek State Park
- Portions of State Game Lands #158, 108, 184, 198, located along the Allegheny Front,
- State Game Lands #166 near the headwaters of Canoe Creek,
- State Game Lands #147 at the headwaters of Sinking Creek,

- State Game Lands #73 and 118 along Tussey Mountain adjacent to Frankstown Branch and Clover Creek,
- State Game Lands #166 north of the Little Juniata River and PA 453
- Part of Rothrock State Forest north of the lower Little Juniata River
- Little Juniata State Forest Natural Area

PA Fish and Boat Commission Class A (highest biomass category) trout streams:

- Spruce Creek is a nationally known naturally reproducing brown trout fishery that has been visited by former President Jimmy Carter and other dignitaries.
- Clover Creek, from LR7009 to mouth, brown trout
- Piney Creek, mouth of Poverty Run to mouth, brown trout
- Tipton Run, brown trout
- Big Fill Run, confluence of Wolf Run down to mouth, brown trout
- Fox Run basin, brown trout

Chapter 93 Exceptional Value (EV) and High Quality (HQ) streams:

EV:

- Big Fill Run, source to T-606 bridge

HQ:

- Mill Run, source to Allegheny Reservoir
- Canoe Creek
- Piney Creek
- Clover Creek
- Tipton Run
- Big Fill Run, T-606 to mouth
- Spruce Creek

**Water Quality Impairment**

Several types of point and nonpoint source pollution affect subbasin 11A. Creeks through the developed areas around the City of Altoona and its suburbs are degraded by industrial and municipal point source discharges of organics and PCB's, suspended solids and organic enrichment/low dissolved oxygen (DO) from urban runoff and combined sewer overflows, siltation from road runoff, and small residential development. Rural areas are affected by discharges of metals, acid and siltation from abandoned mines, siltation from habitat and streambank modification, and agricultural grazing and crop lands. The impaired areas are limited, however, and the subbasin is largely unimpaired.

Monitoring/Evaluation

The subbasin was evaluated under the Department's unassessed waters program in 2000. Only seventeen percent of the watershed, or 218.9 miles out of 1314.3 miles assessed, were determined to be impaired.

DEP biologists use a combination of habitat and biological assessments as the primary mechanism to evaluate Pennsylvania streams under the Unassessed Waters Program. This method requires selecting stream sites that would reflect impacts from surrounding land uses that

are representative of the stream segment being assessed. The biologist selects as many sites as necessary to establish an accurate assessment for a stream segment. The length of the stream segment assessed can vary between sites. Several factors are used to determine site location and how long a segment can be, including distinct changes in stream characteristics, surface geology, riparian land use, and the pollutant causing impairment. Habitat surveys and a biological assessment are conducted at each site. Biological surveys include kick screen sampling of benthic macroinvertebrates, which are identified to family in the field, and an evaluation of their tolerances to pollution. Benthic macroinvertebrates are the organisms, mainly aquatic insects, that live on the stream bottom. Since they are short-lived (most have a one-year life cycle) and relatively immobile, they reflect the chemical and physical characteristics of a stream and chronic pollution sources or stresses. Habitat assessments evaluate how deeply the stream substrate is embedded, degree of streambank erosion, condition of riparian vegetation, and amount of sedimentation.

The extent of the coal measures and impairment from AMD in the subbasin are limited to streams which originate on the Allegheny Front in hwestern Blair County. Several streams in the Beaverdam Branch watershed are affected, including all of the main stems of Beaverdam Branch, Burgoon Run, Kittanning Run and Sugar Run, and portions of Glenwhite Run and two of its tributaries and portions of Scotch Gap Run. Two tributaries of the Little Juniata River, tributaries of bells Gap Run and portions of main stem Bear Loop Run, are also affected. Many of these discharges affect water supply reservoirs for the City of Altoona. The landscape of Kittanning Run in particular is scarred by large areas of refuse piles and iron precipitate encrusted outwashes near the entryways of deep mines, and many abandoned highwalls and refuse piles adjacent to surface mines. Glenwhite Run, Shaw Run and Sugar Run are also degraded by abandoned mine discharges. Two of these streams Glenwhite Run and Kittanning Run are part of a water supply reservoir complex owned by the Altoona Water Authority. Kittanning Run is bypassed around the reservoirs. Treatment of water in these reservoirs to drinking water standards is very expensive due to excessive acidity, iron and aluminum. The treatment of abandoned mine discharges in the Glenwhite Run watershed should improve water quality upstream of the reservoir.

Urban runoff and industrial municipal discharges affect many streams flowing through the Altoona metropolitan area. Streams in the Altoona area have been affected by urban runoff and combined sewer/storm (CSO) water overflows. Mill Run is an example of how changes in land use patterns from forested to urban can affect a watershed. Mill Run originates on a mountain top in Cambria County. An abandoned mine near the headwaters causes it to become slightly acidic. As it flows downstream in a ravine along PA route 36, it travels through more alkaline strata and receives limestone gravel that washes off the highway. Mill Run has an excellent native brook trout population through this forested ravine. It enters one of Altoona's water supply reservoirs, Mill Run Reservoir, then flows through an open, suburban area into the city of Altoona where it is ditched and becomes degraded by combined CSO overflows.

Despite the extensive farming in the valleys, only 24.44 stream miles out of the total 1,314 miles in the subbasin are impaired by agriculture. Much of the farmland is in pasture and the total acreage of farms is low compared to other subbbasins in Pennsylvania. The rugged mountainous terrain and the extensive forested ridges limit the amount of land suitable for agricultural use.

Watersheds affected by agriculture include portions of Piney Creek, Logan Spring Run, and Spruce Creek and its tributaries Halfmoon Creek and Warriors Mark Run. The most impaired of these is Warriors Mark Run, which enters the lower end of Spruce Creek, which has one mile of the main stem and the entire 13.63 miles of the Right Branch watershed impaired.

Approximately 17 miles are impaired by municipal or industrial point source discharges. A total of 14.62 miles of main stem Frankstown Branch is affected by paper mill waste, although the stream has improved somewhat over historical conditions since the wastewater treatment plant was upgraded. Urban runoff alone or in combination with industrial, municipal waste, or abandoned mine discharges impairs portions of Halter Creek, Mill Run, main stem Little Juniata River, Kettle Creek, and Beaverdam Branch. Industrial discharges have caused the entire Beaverdam Branch watershed to have a fish consumption advisory due PCB's.

The DEP Bureau of Mining and Reclamation conducted studies and declared upper Mill Creek and portions of Bells Gap Run as unsuitable for surface mining due to high probability of acid mine drainage if coal were mined in these watersheds. Two tributaries of Bells Gap Run are impaired by abandoned mine drainage. Both watersheds have public water supplies for the city of Altoona.

#### Future threats to water quality

Increased urbanization has the potential for additional storm water runoff problems. The coal industry has been declining, many deep mines are being closed and operators are going out of business. Future threats to water quality from mining will likely decrease due to mine abandonment and cessation of pumping and treating of discharges by the current responsible owners or through remediation funded by state and federal agencies.

Urbanization and paving can have a severe effect on stream aquatic life. Studies by the Maryland Department of Natural Resources showed that a reduction in stream aquatic species diversity may begin with as little as 2% impervious cover. Maryland streams with above 15% impervious cover were rated fair to poor for aquatic species. When the impervious cover reached 25%, species diversity was significantly reduced. Riparian vegetation removal and paving affect both stream water temperature and habitat for aquatic species. Organisms most affected include many species of reptiles and amphibians, brook trout, and stoneflies. Stormwater runoff from paved areas can also wash out oil and grease and other pollutants into streams. The paved areas also restrict replenishment of groundwater and contribute to flash flooding during storm events and extreme fluctuations in stream water levels. Extreme flow fluctuations cause difficulties in the attachment of bottom dwelling organisms to the stream substrate and also cause a scouring of the substrate. Retention of riparian vegetation in unnamed headwater tributaries, known as first order streams, which may comprise as much as 50% of the streams in a watershed, can be especially critical to the protection of organisms in the downstream watershed.

#### **Restoration Initiatives**

##### Pennsylvania Growing Greener Grants:

- \$34,113 (FY2001) to Blair Township Board of Supervisors for assessment and development of a restoration plan for the Beaverdam Branch of the Juniata River.

- \$38,500 (FY2001) to the Blair County Conservation District for an assessment of the Sugar Run watershed.
- \$29,500 (FY2000) to Duncansville Borough for restoration, protection and improvement of approximately 1700 feet of Blair Gap Run.
- \$734,215 (2000) to the Blair County Conservation District for construction of two vertical flow passive treatment systems, 4 settling basins, a wetland, a 700 foot diversion ditch, 1705 foot limestone channel to collect and treat five abandoned mine drainage discharges having a flow of 140 gal/min with 68 tons/yr acidity and aluminum levels up to 25 mg/l. A total of 12 acres will be seeded and stabilized.
- \$150,000 (1999) to the Blair County Conservation District (CD) to continue passive treatment of abandoned mine drainage in Glenwhite Run watershed.
- \$30,000 (1999) to Holidaysburg Borough for continuing educational activities for municipalities bordering the Beaverdam Branch of the Juniata River.
- \$15,630 (1999) to the Blair County Conservation District to stabilize an eroding portion of Spring Run streambank within the city of Altoona, thereby preventing erosion damage to an adjacent baseball field.
- \$184,800 (1999) to the City of Altoona to conduct restoration activities on a 2.8-mile section of Mill Run, a stream impaired by urban runoff.
- \$1,000 (1999) to Blair County Conservation District to host 2 seminars to provide ideas, assistance, and showcase success stories for local citizens interested in forming watershed associations. The long-term plan is to increase environmental awareness and implement projects to reduce sources of nonpoint source pollution.
- \$1,205 (1999) to Friends of Sinking Valley to organize a watershed group in Sinking Valley, Blair County to increase the growing population's knowledge about the watershed. The sponsors plan to survey citizens of the area and follow up with town meetings to identify present and potential future watershed problems.

US EPA Clean Water Act Section 319 Grants:

- \$41,000 (1999) to DCNR-Bureau of State Parks for an assessment and management plan for Canoe Creek Lake.
- \$101,500 (1999) to the Blair County Conservation District for passive treatment of abandoned mine discharges to the south tributary of Glenwhite Run. The project was completed in fall 1999 and is successfully treating the major discharge on the South Tributary of Glenwhite Run.

Pennsylvania Watershed Restoration Assistance Program (WRAP):

- \$6,400 (1999) to Blair County Conservation District for a display to educate the public on nonpoint source pollution prevention and the effects landowners have on their watershed
- \$1,950 (1999) to Holidaysburg Borough for pollution prevention environmental education projects.

DEP BAMR 10% set-aside

- \$250,000 to Blair County Conservation District for passive treatment of an abandoned mine discharge to Bells Gap Run.
- \$600,000 and \$273,000 to Blair County Conservation District for passive treatment of abandoned mine discharges in Glenwhite Run watershed. The first project was a pyrolucite bacteria inoculated treatment system.

US NRCS PL-566 Program:

- \$770,000 matching funding for abatement of AMD in Glenwhite Run
- NRCS PL-566 study of agricultural impacts on Clover Creek

#### PENNVEST

- \$971,000 loan to Freedom Township Water and Sewer Authority to expand sewage treatment plant to eliminate potential wet weather overloads and to accept sewage from Blair Township to eliminate numerous malfunctioning on-lot disposal systems.
- \$1.5 million loan to Northern Blair County Regional Sewer Authority to construct 5 miles of sewage collection lines to serve 181 houses in Antis Township where there are a significant number of malfunctioning on-lot systems.

#### Other:

- Shaw Run AMD remediation funded through EPA Regional Geographic Initiative, Heinz Foundation, Western Pennsylvania Watershed Protection Program, and PA DEP Bureau of Abandoned Mine Reclamation.

#### Settlement/fines against Conrail for illegal dumping of hazardous waste (July 2000):

- \$340,000 to Blair County Conservation District for remediation of abandoned mine drainage in Glenwhite Run.
- \$125,000 to Blair County Conservation District for stream restoration on the Frankstown and Beaverdam Branches of the Juniata River.
- \$125,000 for other nonpoint source pollution control and watershed restoration projects in the subbasin.

#### League of Women Voters (WREN) Mini-grants:

- \$768 to Fort Roberdeau to develop public educational programs addressing septic tank management, sinkhole dumping, and use of lawn care chemicals.

### **Public Outreach**

#### Watershed Notebooks

DEP's website has a watershed notebook for each of its 104 State Water Plan watersheds. Each notebook provides a brief description of the watershed with supporting data and information on agency and citizen group activities. Each notebook is organized to allow networking by watershed groups and others by providing access to send and post information about projects and activities underway in the watershed. This WRAS will be posted in the watershed notebook to allow for public comment and update. The notebooks also link to the Department's Watershed Idea Exchange, an open forum to discuss watershed issues. The website is [www.dep.state.pa.us](http://www.dep.state.pa.us). Choose Subjects/Water Management/Watershed Conservation/Watershed and Nonpoint Source Management/Watershed Notebooks.

#### Citizen/Conservation groups

- Blair County Trout Unlimited
- Juniata Valley Audubon Society
- Horseshoe Curve Resource Coalition

### **Funding Needs**

The total needed dollars for addressing all nonpoint source problems in the watershed is undetermined at this time and will be so until TMDLs are developed for the watershed. However, existing programs that address nonpoint source issues in the watershed will continue to move forward.

Pennsylvania has developed a Unified Watershed Assessment to identify priority watersheds needing restoration. Pennsylvania has worked cooperatively with agencies, organizations and the public to define watershed restoration priorities. The Commonwealth initiated a public participation process for the unified assessment and procedures for setting watershed priorities. Pennsylvania's assessment process was published in the *Pennsylvania Bulletin, DEP Update* publication and World Wide Web site. It was sent to the Department's list of watershed groups, monitoring groups, and Nonpoint Source Program mailing list. Department staff engaged in a significant outreach effort which included 23 additional events to solicit public comment. The Department received 23 written comments from a variety of agencies, conservation districts and watershed groups. Pennsylvania is committed to expanding and improving this process in the future.

After development of the initial WRAS a public participation process will take place to incorporate public input into expanding and "fine tuning" the WRAS for direction on use of 319 grant funds beyond FY2000.

Restoration of streams impaired by agriculture should begin Spruce Creek watershed to protect the nationally known brown trout fishery. The impairment on the main stem and the lower end of Halfmoon Creek is concentrated in the upper third of the Spruce Creek watershed near the Blair-Centre County line. Best management practices (BMPs) should be installed to restore the nearly 15 impaired miles in Warriors Mark Run watershed, the worst of the impaired watersheds in the subbasin. Approximately 2 miles of Spruce Creek and 3 miles of its tributary Halfmoon Creek also need BMPs. BMPs will help reduce sediment and nutrients. The next most impaired watershed is Logan Spring Run, which has over 4 miles of the main stem impaired.

Slightly over 31 miles of subbasin streams are impaired by abandoned mine drainage (AMD). The worse of the impairment is in the Beaverdam Branch watershed. The Horseshoe Curve Resources Coalition along with the Blair County Conservation District has as their goal to begin restoration of all Blair County watersheds affected by AMD by the year 2005. A NRCS PL-566 report estimated a total cost of \$1.6 million to passively treat discharges and reclaim and revegetate refuse piles in Glenwhite Run watershed. Treatment of these discharges would benefit water supply users and restore fisheries. Money for Glenwhite Run watershed restoration has been secured through state, federal, and private sources, including NRCS, EPA Clean Water Act Section 319, DEP Bureau of Abandoned Mine Reclamation 10% set-aside programs and the Heinz Foundation. Active mining that has occurred recently in Sugar Run and Kittanning Run watersheds has resulted in reclamation of some abandoned mine sites in the subbasin. Kittanning Run will be difficult to restore because of the extensive unreclaimed areas and the highly mine acidic discharges in the watershed. Sugar Run and Beaverdam Branch also are severely degraded by acid mine drainage.

#### **References/Sources of information**

- State Water Plan, Subbasin 11, Upper Juniata River. Department of Environmental Protection, January 1980
- USGS Topographic Maps
- 319 project proposals and summaries



- DEP: Watershed Notebooks, Unified Assessment Document, and information from files and databases.
- Map of Draft Level III and IV Ecoregions of Pennsylvania and the Blue Ridge Mountains, Ridge and Valley, and Central Appalachians of EPA Regions III
- Summary Report of Selected Agricultural Statistics from Published Watershed Assessment Reports in the Susquehanna and Potomac River Basins. PA Department of Environmental Resources, Division of Chesapeake Bay and Agricultural Nonpoint Source Programs, June 1990.
- DEP Bureau of Mining and Reclamation Unsuitable for Mining Technical Study Reports for Mill Run and Bells Gap Run.
- Glenwhite Run Watershed Plan and Environmental Assessment. USDA, NRCS. July 1997
- PA Fish and Boat Commission reports and files

**Streams in Subbasin 11A: 303d/305b Listings**

<b>Stream</b>	<b>Stream Code</b>	<b>Drainage area square miles</b>	<b>Miles Impaired</b>	<b>Miles Attained</b>	<b>Causes/Sources/Comments</b>
2- Juniata River				0.09 main stem	
<b>3-Frankstown Branch Juniata River</b>	16061	395	14.62 main stem  2.13 of 2 UNTs	31.63 main stem; all of 77 UNTs;  4.2 of 2 UNTs	Cause unknown, Priority organics, other inorganics & Suspended solids from IND Siltation from Road runoff
4-Beaverdam Creek & 17 UNTs	16642	20.4		All	
5-Little Beaverdam Creek	16690	0.37		All	
5-Smoky Run & 9 UNTs	16665	4.86		All	
5-Boiling Spring Run & 13 UNTs	16651	6.08		All	
5-Pine Run & 5 UNTs	16643	2.12		All	
4-South Poplar Run & 7 UNTs	16623	12.3		All	
5-Big Lick Branch & 2 UNTs	16637	1.45		All	
5-Carson Run & 6 UNTs	16627	4.91		All	
“Wolf Hollow”	16629			All	
4-Polecat Run & 17 UNTs	16599	3.97		All	
4-Pawpaw Run & 3 UNTs	16592	0.92		All	
4-South Dry Run & 17 UNTs	16573	6.43		All	
4-McDonald Run & 6 UNTs	16563	1.64		All	
4-Halter Creek	16503	33.4	3.29 main stem	6.15 main stem; All of 22 UNTs	Cause unknown from Subsurface mining; Suspended solids from URB
5-Cabbage Creek & 2 UNTs	16542	4.0		All	
5-Plum Creek	16504	17.4	1.39 main stem	6.74 main stem; All of 33 UNTs	Siltation from Bank modification & Road runoff

4-Poplar Run & 25 UNTs	16462	17.4		All	
5-Blue Knob Run & 11 UNTs	16476	4.57		All	
4-Oldtown Run & 21 UNTs	16434	11.4		All	
<b>4-Beaverdam Branch</b>	16317	87.1	6.07 main stem [All]	All of 26 UNTs	Metals, from AMD; Organic enrichment/low DO from combined sewer overflows; Cause unknown from URB [FISH]
5-Burgoon Run	16416	15.2	4.38 main stem; 0.67 of one UNT [All]	All of 5 UNTs; 0.64 of one UNT	Metals, pH & siltation from AMD [FISH]
6-Glenwhite Run	16428	5.53	3.23 main stem; 0.93 of 2 UNTs [All]	1.3 of main stem; All of 2 UNTs	Metals, pH & siltation from AMD [FISH]
6-Kittanning Run	16423	3.60	3.74 main stem [All]	All of 4 UNTs	Metals from AMD [FISH]
6-Scotch Gap Run	16422	1.40	0.25 main stem [All]	1.8 of main stem; All of 4 UNTs	Siltation & pH from AMD [FISH]
5-Mill Run	16403	13.2	4.79 main stem [All]	4.17 upper main stem; All of 10 UNTs	Unknown from URB & MUNI [FISH] <i>HQ-CWF and Unsuitable for mining, upper basin</i>
6-Dry Gap Run & one UNT	16412	1.57	[All]	All	[FISH]
5-Sugar Run at Altoona	16389	9.08	7.47 main stem [All]	All of 21 UNTs	Metals & pH from AMD [FISH]
5-Spencer Run	16378	3.82	0.81 main stem [All]	3.23 man stem; All of 7 UNTs	Siltation from Small residential development & URB [FISH]
5-Blair Gap Run & 15 UNTs	16335	27.9	[All]	All	[FISH]
6-Adams Run	16362	2.30	[All]	All	[FISH]
7-Redlick Run	16371	0.97	[All]	All	[FISH]
7-Blair Run & 7 UNTs	16363	6.63	[All]	All	[FISH]
6-Dry Run & 5 UNTs	16348	4.02	[All]	All	[FISH]

6-Gillans Run & 10 UNTs	16336	6.12	[All]	All	[FISH]
5-Brush Run & 11 UNTs	16318	11.8	[All]	All	[FISH]
4-Brush Creek & 6 UNTs	16310	3.57		All	
4-Robinson Run at Reese & 9 UNTs	16293	4.94		All	
4-Canoe Creek & 15 UNTs	16252	25.4		All	<i>HQ-CWF</i>
5-New Creek & 14 UNTs	16255	6.63		All	<i>HQ-CWF</i>
4-Township Run	16249	0.71		All	
4-Piney Creek	16203	25.4	0.8 of one UNT	All of main stem & 44 UNTs; 4.17 of one UNT	Siltation from AG- Crops & grazing <i>HQ-CWF</i>
<b>4-Clover Creek &amp; 72 UNTs</b>	16115	50.1		All	<i>HQ-CWF</i>
5-Middle Run & 3 UNTs	16182	2.69		All	<i>HQ-CWF</i>
5- Snare Run	16116	0.85		All	<i>HQ-CWF</i>
4-Schmucker Run & 2 UNTs	16111	2.68		All	
4-Yellow Spring Run & one UNT	16104	3.43		All	
4-Roaring Run & one UNT	16102	2.70		All	
4-Fox Run & 2 UNTs	16099	2.57		All	
4-Emma Creek & one UNT	16066	2.70		All	
5-Robinson Run near Alexandria & 10 UNTs	16067	9.86		All	
<b>3-Little Juniata River</b>	15664	343	5.6 main stem	26.2 main stem & all of 64 UNTs	Organic enrichment/low DO and unknown from MUNI and URB
4 Spring Run	16052	7.2	1.65 main stem	4.45 main stem; All of 8 UNTs	Siltation from Small residential development
4-Kettle Creek	16049	3.97	0.97 main stem	3.07 main stem & all of 2 UNTs	Siltation from URB
4-Homer Gap Run & 7 UNTs	16032	5.49		All	
4-Sandy Run & 14 UNTs	16016	8.64		All	

4-Riggles Gap Run & 9 UNTs	16006	6.34		All	
4-Sugar Run at Bellwood & 8 UNTs	15996	2.59		All	
4-Bells Gap Run	15954	23.0	3.15 of 2 UNTs	All of main stem & 15 UNTs	Metals, siltation, pH from AMD <i>Unsuitable for mining, portions of watershed</i>
5-Green Springs Run & 3 UNTs	15989	2.13		All	
5-Tubb Run & 5 UNTs	15983	2.56		All	
5-Bear Loop Run	15978	1.20	1.26 main stem	0.55 main stem & all of one UNT	Metals and other organics from AMD
5-Shaw Run & 5 UNTs	15963	3.94		All	
5-Kelso Run & 3 UNTs	15957	1.58		All	
4-Tipton Run & 8 UNTs	15908	18.1		All	<i>HQ-CWF</i>
5-Three Springs Run & 3 UNTs	15923	3.22		All	<i>HQ-CWF</i>
5-Loup Run & one UNT	15918	3.14		All	<i>HQ-CWF</i>
5-“Mulligan Hollow” & 4 UNTs	15913	2.29		All	<i>HQ-CWF</i>
4-“Fry Hollow” & 8 UNTs	15896	2.85		All	
4-Hutchinson Run & 8 UNTs	15885	3.27		All	
4-Schell Run & one UNT	15883	1.75		All	
<b>4-Bald Eagle Creek</b>	15835	52.6	2.12 main stem	9.98 main stem; All of 13 UNTs	Thermal modifications from IND
“Deepcut Hollow”	63922			All	
5-Big Fill Run & 8 UNTs	15869	13.5		All	<i>EV, upper basin; HQ-CWF, lower basin</i>
6-Wolf Run & 3 UNTs	15876	3.36		All	<i>EV</i>
6-Bright Run	15873	2.14		All	<i>EV</i>
5-Vanoscoyoc Run & 10 UNTs	15858	7.71		All	
5-“Baughman Hollow”	15856	1.07		All	

5-Gypsy Run & one UNT	15853	2.30		All	
7-“Cook Hollow”	15855	1.85		All	
5-Decker Run & 5 UNTs	15847	4.10		All	
5-Laurel Run	15846	0.53		All	
5-Sink Run & 9 UNTs	15836	6.78		All	
5-“Plummer Hollow”	15834	0.64		All	
4-Logan Spring Run	15823	7.70	4.23 main stem	All of 10 UNTs	Siltation from AG-Grazing & Habitat modification
4-Elk Run & 3 UNTs	15819	5.92		All	
4-Gensimore Run& one UNT	15808	3.89		All	
4-Sinking Run & 41 UNTs	15770	29.1		All	
<b>4-Spruce Creek</b>	15674	109	1.91 main stem	14.44 main stem & all of 19 UNTs	Siltation from AG <i>HQ-CWF</i>
5-Beaver Branch & 18 UNTs	15746	29.1		All	<i>HQ-CWF</i>
5-Halfmoon Creek	15728	23.8	2.87 main stem	8.28 main stem & all of 18 UNTs	Suspended solids from AG- Grazing & Other sources <i>HQ-CWF</i>
5-Fowler Run & 5 UNTs	15722	2.16		All	<i>HQ-CWF</i>
5-Warriors Mark Run	15679	26.8	1.0 main stem	4.56 main stem; All of 12 UNTs	Nutrients & Siltation from AG-Grazing <i>HQ-CWF</i>
6-(Left Branch) Warriors Mark Run & 4UNTs	15692			All	<i>HQ-CWF</i>
6-(Right Branch) Warriors Mark Run	15697		5.15 main stem; 8.48 of 12 UNTs		Nutrients & Siltation from AG-Grazing <i>HQ-CWF</i>
4-McLain Run & one UNT	15671	3.92		All	
4-“Teaberry Hollow”	15664	0.36		All	

Streams are listed in order from upstream to downstream. A stream with the number 2 is a tributary to a number 1 stream, 3's are tributaries to 2's, etc. Susquehanna River=1, Juniata River=2.

Stream names in Quotes are local names

Classification in Chapter 93: HQ= High Quality, CWF= Cold Water Fishes, EV= Exceptional Value

AG= Agriculture, AMD= Abandoned Mine Drainage, URB= Urban runoff/storm sewers;  
IND= Industrial point source; MUNI= Municipal point source

[FISH]= [Fish consumption advisory, source unknown, PCB]