Description of the Juniata Subbasin

The Juniata Subbasin drains an area of approximately 3,400 square miles from west of Bedford to Duncannon, Pa., which includes significant portions of Bedford, Blair, Fulton, Huntingdon, Perry, Juniata, and Mifflin Counties. Two different ecoregions are found within this area:

- Central Appalachian Ridges and Valleys (Ecoregion 67)
- Central Appalachians (Ecoregion 69) (Omernik, 1987)

Ecoregion 67 is characterized by almost parallel ridges and valleys formed by folding and faulting events. The predominant geologic materials include sandstone, shale, limestone, dolomite, siltstone, chert, mudstone, and marble. Springs and caves are common in this ecoregion. Ecoregion 69 is mainly a plateau formation that is predominantly sandstone, shale, conglomerate, and coal. Mining for bituminous coal can occur in this ecoregion. Six different subecoregions are found in the Juniata Subbasin:

- 67a - Northern Limestone/ Dolomite Valleys
- 67b - Northern Shale Valleys
- 67c - Northern Sandstone Ridges
- 67d - Northern Dissected Ridges and Knobs
- 69a - Forested Hills and Mountains
- 69b - Uplands and Valleys of Mixed Land Use (Omernik and others, 1992) (Figure 2).

The mixed land use in the Juniata Subbasin primarily includes forested areas concentrated in the ridges, with agricultural and urban areas in the valleys (Figure 3). Many of the forested areas are state forest or state game lands. The largest urban center is Altoona; other notable developed areas include Bedford, Everett, Tyrone, Huntingdon, Mount Union, Lewistown, and Newport. Other important land uses in this subbasin are abandoned mine land (AML) and impounded water in Raystown Lake. Raystown Branch Juniata River was dammed in 1968 primarily for flood control, but the lake also is used as a recreational impoundment. Today, some hydroelectric power is generated at this dam.

Residents of the Juniata River Watershed and others are interested in protecting the river's resources and accounting its history. *Juniata River of Sorrows* by Dennis P. McIlnay (2003) details the fishing resources available from this river and gives accounts of the troubled history of this region through the struggle for its land and resources. Through numerous floating trips down the Juniata, McIlnay provides information on fishing hot spots, boating trouble spots, and the fish and other aquatic life that reside in the mainstem Juniata River. Fish mentioned in this book include walleye, brown trout, rainbow trout, Palomino trout, muskellunge, carp, rock bass, and smallmouth and largemouth bass.

The Juniata Subbasin is unique in that there is a nonprofit group organized to promote its environmental health and stability. In 1997, the Chesapeake Bay Foundation brought together concerned citizens and

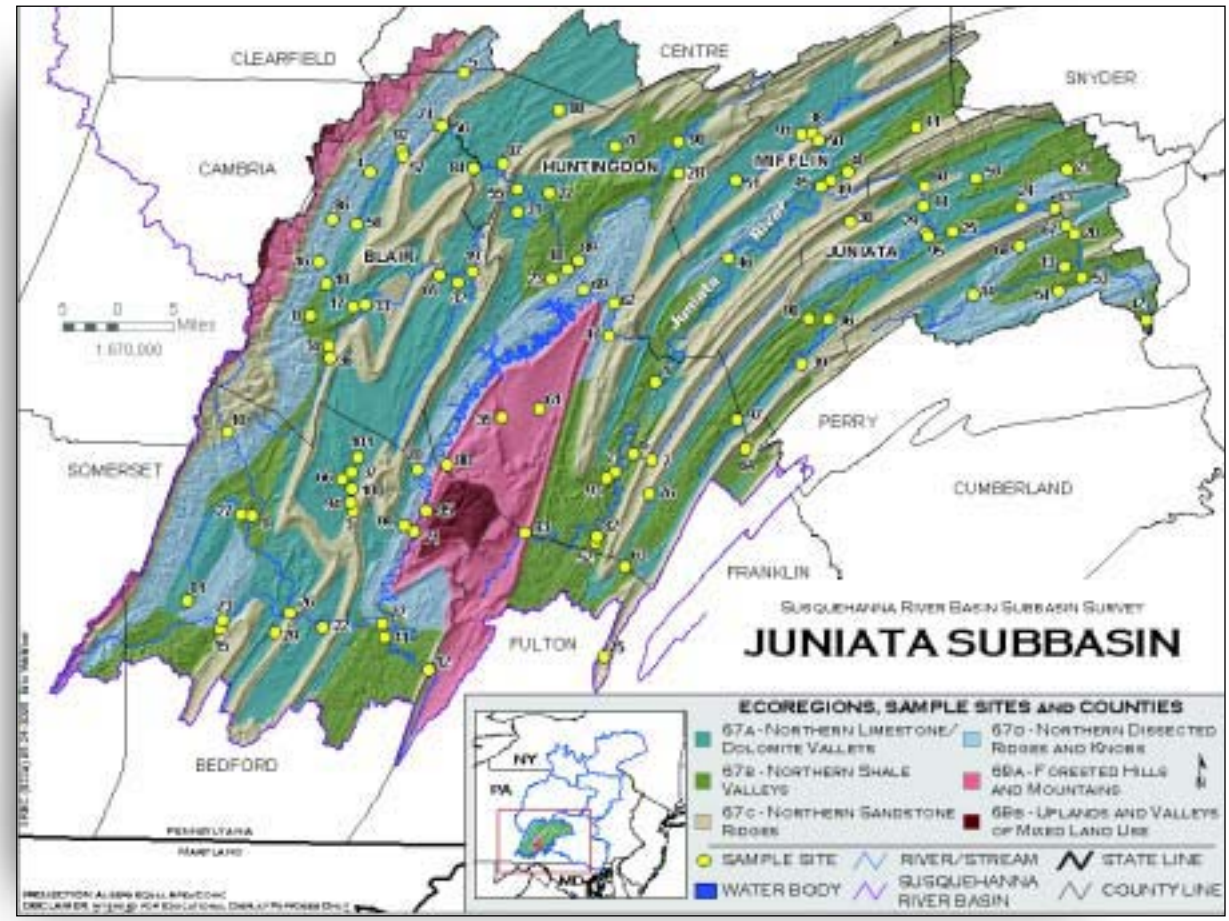

Figure 2. *Ecoregions, Subecoregions, and Counties in the Juniata Subbasin*

stakeholders from community groups, nonprofit conservation organizations, county planning offices, and county conservation districts to develop a Juniata Watershed Management Plan. This group eventually became the Juniata Clean Water Partnership (JCWP) whose mission statement is, "...building and sustaining local capacity through education, assistance, and advocacy in order to enhance, restore, and protect the natural resources of the Juniata watershed" (JCWP, 2005). Annually, JCWP holds a Juniata Watershed Summit to bring together the people and groups of the watershed to share information, provide training to implement the Juniata Watershed Management Plan, and highlight achievements in the watershed. Additionally, JCWP publishes a *Juniata Watershed Journal* newsletter seasonally that provides information on activities and projects going on at JCWP and in the watershed. Every year, JCWP organizes a Juniata Sojourn to explore the river, natural resources, and local communities by boat and promote stewardship of the land and water. Contact information for JCWP and other watershed groups within the Juniata Subbasin can be found in Table 1.

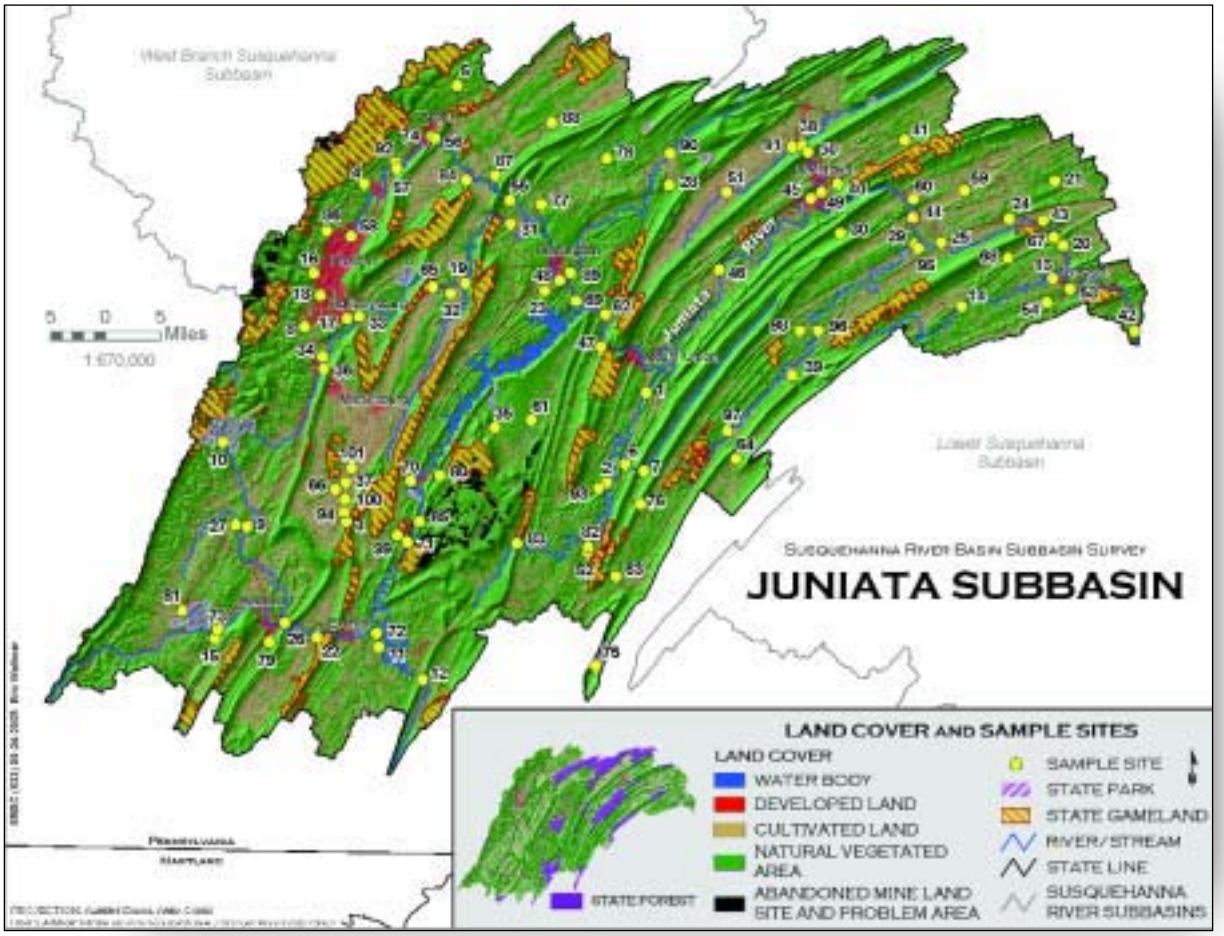

Figure 3. *Land Use in the Juniata Subbasin*

In 2004, the Juniata River experienced near-record flooding with streamflows near the mouth at Newport, Pa., being 74 percent above normal for the year (SRBC, 2004). Remnants of hurricanes Frances, Ivan, and Jeanne hit Pennsylvania from September 8-10, 17-19, and 27-28, respectively, dumping seven to ten or

Table 1. *Contact Information for Watershed Organizations and County Conservation Districts in the Juniata Subbasin*

Organization Name	County	Contact Person	Address	Phone	Email or Website
Beaverdam Branch Watershed Coalition	Blair	Ms. Mary Ann Elder	9 Grand View Court, Duncansville, PA 16635	(814) 695-8763	beaverdambranch@aol.com
Blair Senior Services (Blair Gap Run)	Blair	Ms. Cheryl Nolan	Blair County Senior Services 1320 12th Ave, Altoona, PA 16601	(814) 946-1235	
Bob's Creek Stream Guardians	Bedford	Mr. Tim Clingerman	1561 Tulls Hill Road, Bedford, PA 15522	(814) 733-2394	
Trough Creek Watershed Association	Huntingdon	Mr. Roy McCabe	P.O. Box 66, Wood, PA 16694	(814) 635-4120	ebtminer@nb.net
Juniata Clean Water Partnership (JCWP)	Huntingdon/Mifflin/ Juniata/Perry	Mr. Mike Makufka	416 Penn Street, Huntingdon, PA 16652	(814) 506-1190	mmakufka@jcwp.org / www.jcwp.org
Little Juniata Watershed Association	Huntingdon/Blair				http://www.littlejuniata.org
Shoups Run Watershed Association	Huntingdon	Ms. Gracie Angelo	RR 1 Box 258 A1A, Saxton, PA 16678	(814) 635-2600	beckydolte@adelphia.net
Six Mile Run Area Watershed Committee	Bedford				
Spruce Creek Watershed Association	Huntingdon	Ms. Sharon Dell	5269 Trout Run Lane, Spruce Creek, PA 16683		smd11@psu.edu
Yellow Creek Coalition	Bedford	Mr. Fred Sherlock	132 McElwee Drive, Hopewell, PA 16650	(814) 766-3176	
Bedford Conservation District	Bedford		702 West Pitt Street, Fairlawn Court Suite 4, Bedford, PA 15522	(814) 623-7900 ext 3	bedcocd@earthlink.net
Blair Conservation District	Blair		1407 Blair Street, Hollidaysburg, PA 16648	(814) 696-0877 ext. 5	dfisher@blairconservationdistrict.org
Fulton Conservation District	Fulton		216 N. Second St., Suite 15, McConnellsburg, PA 17233	(717) 485-3547	fultoncounty@state.pa.us
Huntingdon Conservation District	Huntingdon		RR #1, Box 7C, Huntingdon, PA 16652-9603	(814) 627-1627	c-apatters@state.pa.us
Juniata Conservation District	Juniata		RR#5, Box 35, Stoney Creek Drive, Mifflintown, PA 17059	(717) 436-8953 ext. 5	c-dlauver@state.pa.us
Mifflin Conservation District	Mifflin		20 Windmill Road, Suite 4, Burnham, PA 17009	(717) 248-4695	c-ddunmire@state.pa.us
Perry Conservation District	Perry		P.O. Box 36, New Bloomfield, PA 17068	(717) 582-8988 ext. 4	c-tbrajkov@state.pa.us
Western PA Coalition for Abandoned Mine Reclamation	Westmoreland	Coalition Regional Coordinator, Westmoreland Conservation District	Donohoe Center, RR 12 Box 202B, Greensburg, PA 15601	(412) 837-5271	Westmoreland.conservation@dep.state.pa.us

more inches of rain, making this the second wettest month in the state's history (The Pennsylvania State Climatologist, 2004; National Weather Service, 2005). The flooding occurred during the sampling for this subbasin report. The streams were allowed to subside before sampling resumed; however, the streams were still above normal flow, and many of the stream channels had been changed dramatically from scour and deposition. This flooding may have impacted the biological and habitat scores of streams sampled after these flooding events.

S. LeFevre

Photo at left: September Flooding of Juniata River and Crooked Creek from remnants of Hurricane Frances, Huntingdon, Pa.

Photo below: Confluence of Crooked Creek and Juniata River at normal flow, Huntingdon, Pa.

S. LeFevre

Methods Used in the 2004 Subbasin Survey

DATA COLLECTION

During the summer and fall of 2004, SRBC staff visited and collected samples from 101 sites throughout the Juniata River Subbasin. Appendix A contains a list with the sample site number, station name (designated by approximate stream mile), description of the sampling location, latitude and longitude, drainage in square miles, and subecoregion and drainage size category. Sites that also were sampled in 1995 are listed in blue with an asterisk. Sites that were sampled after the flooding in September are in bold print. Macroinvertebrate samples were taken at 81 sites. Staff could not sample 20 sites due to high water conditions. Habitat was rated at the sites where a macroinvertebrate sample was collected.

The sites were sampled once during this Year-1 sampling effort to provide a point-in-time picture of stream characteristics throughout the whole subbasin. Samples were collected using a slightly modified version of the USEPA's Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers (RBP III) (Barbour and others, 1999).

Water Quality

A portion of the water sample from each collection site was separated for laboratory analysis, and the rest of the sample was used for field analysis. A list of the field and laboratory parameters and their units is found in Table 2. Measurements of flow, water temperature, dissolved oxygen, pH, conductivity, alkalinity, and acidity were taken in the field. Flow was measured using standard U.S. Geological Survey methodology (Buchanan and Somers, 1969). Temperature was measured in degrees Celsius with a field thermometer. A Cole-Parmer Model 5996 meter was used to measure pH. Dissolved oxygen was measured with a YSI 55 meter, and conductivity was measured with a Cole-Parmer Model 1481 meter. Alkalinity was determined by titration of a known volume of sample water to pH 4.5 with

Table 2. *Water Quality Parameters Sampled in the Juniata Subbasin*

FIELD PARAMETERS	
Flow, instantaneous cfs[a]	Conductivity, µmhos/cm[c]
Temperature, °C	Alkalinity, mg/l
pH	Acidity, mg/l
Dissolved Oxygen, mg/l[b]	
LABORATORY ANALYSIS	
Alkalinity, mg/l	Total Magnesium, mg/l
Total Suspended Solids, mg/l	Total Sodium, mg/l
Total Nitrogen, mg/l	Chloride, mg/l
Nitrite - N, mg/l	Sulfate - IC, mg/l
Nitrate - N, mg/l	Total Iron, µg/l[e]
Turbidity, NTU[d]	Total Manganese, µg/l
Total Organic Carbon, mg/l	Total Aluminum, µg/l
Total Hardness, mg/l	Total Phosphorus, mg/l
Total Calcium, mg/l	Total Orthophosphate, mg/l

[a] cfs = cubic feet per second
[b] mg/l = milligram per liter
[c] µmhos/cm = micromhos per centimeter
[d] NTU = nephelometric turbidity units
[e] µg/l = micrograms per liter