Watershed Restoration Action Strategy (WRAS)
State Water Plan Subbasin 17C
Redbank Creek Watershed (Allegheny River)
Jefferson, Armstrong, Clarion, and Clearfield Counties

Introduction

The 728 square mile subbasin 17C includes Redbank Creek and the Allegheny River and its tributaries from the confluence of Redbank Creek downstream to the above the confluence of the Clarion River. Several unnamed tributaries on west shore of the Allegheheny River upstream of the Clarion River are also included in the subbasin. The Redbank Creek watershed drains 573 square miles of this subbasin. The remaining 119 square miles are within the 63.1 square mile Bear Creek watershed and several minor tributaries. Major tributaries of the Redbank Creek include Sandy Lick Creek, 229 square miles, North Fork Redbank Creek, 98.2 square miles, and Little Sandy Creek, 73.2 square miles. The major tributary to Sandy Lick Creek, Mill Creek, drains 52.5 square miles. A total of 1,173 streams flow through the subbasin. The subbasin is included in **HUC Area 5010006**, Middle Allegheny River, Redbank Creek, classified as a Category I, FY99/2000 Priority watershed in the Unified Watershed Assessment.

Geology/Soils

The entire subbasin is within the Western Allegheny Plateau Pittsburgh Low Plateau (70c) Ecoregion, which is characterized by rounded or knobby hills, narrow valleys, entrenched rivers and fluvial terraces. Rock strata are comprised of sequences of sandstone, shale, limestone and coal. All soils in this ecoregion are derived from noncarbonate rocks and have slow to moderate rates of infiltration.

Mineable coals in the Allegheny Group and natural gas deposits are present throughout the watershed. Much of coal reserves were mined and abandoned and contribute polluted mine drainage to the subbasin. The highest total reserves were the Lower Kittanning coal. The Upper and Lower Freeport and the Brookville seams also contained mineable coals. Gas production also occurs in the subbasin.

Land Use

The subbasin has a combination of forested, agricultural, and surface mined land use. The most urbanized areas are the boroughs of DuBois and Brookville, which have industrial development and commercial facilities associated with exits off I-80. The population was 58,100 in 1990 and is projected to increase slightly to 59,000 by the year 2040.

Natural/Recreational Resources:

State Game Lands #244, 31, 108, 105, and 137 are relatively small isolated tracts scattered through the subbasin.

DEP Chapter 93 Exceptional Value (EV) and High-Quality (HQ) Stream Listings:

(EV) Streams:

- Silver Creek, source to SR1004 Bridge at Walley Mill

- South Branch North Fork
- Shippen Run
- Craft Run.

High Quality Streams:

- Silver Creek, SR1004 Bridge at Walley Mill to mouth
- Falls Creek
- Schoolhouse Run
- Little Mill Creek
- North Fork, basin, EXCEPT South Branch, Shippen Run and Craft Run
- Beaver Run, source to PA 36 Bridge

Water Quality Impairment

This largely rural landscape

Monitoring/Evaluation

Sixty percent of the subbasin was assessed under the Department's unassessed waters program in 2000. Nearly all the impairment is by metals and low pH from abandoned mine drainage. The 303d list indicates that the major problem is from precipitated metals, especially iron. Little Sandy Creek and Welch Run were listed as impaired from low pH from AMD. The South Branch Bear Creek was degraded by an industrial point source. Although agriculture land use makes up one third of the subbasin, only one stream, Huling Run, was listed as impaired by agriculture. Fivemile Run was impaired by nutrients and organic enrichment/low DO from a package plant. Discharges from gas well production and storage and disposal of brines has resulted in degraded surface and groundwater in some areas.

Future threats to water quality

The previous major threat to water quality has been from discharges from abandoned underground coal mines. The coal industry has been declining, many deep mines have closed, and operators are going out of business. The mine discharges are being cleaned up with the relatively recent development of passive treatment systems and some active chemical treatment facilities. Water quality, therefore, is expected to improve in the mined areas. Future threats to water quality from mining will likely be due to mine abandonment and cessation of pumping and treating of discharges by the current responsible owners. Water quality should also improve with the expanded schedule of well plugging contracted by the Department's Bureau of Oil and Gas Management.

Restoration Initiatives

Pennsylvania Growing Greener Grants:

- $33,476 (FY2002) to the Butler County Conservation District for an assessment abandoned oil and gas well seeps, abandoned surface mines, and deep mine discharges, and development of a restoration plan for North Branch Bear Creek.
- $131,140 (FY2002) to the Clarion County Conservation District for agricultural BMP's in Redbank Creek watershed.
- $20,000 (FY2002) to the Jefferson County Conservation District to conduct an assessment and develop a restoration plan for Soldier Run.

- $204,000 (FY2002) the Jefferson County Conservation District to backfill an abandoned surface mine and eliminate a 1400-foot highwall in Conifer area of Beaver Run.
- $31,790 (FY2001) to the Jefferson County Conservation District for start-up of the North Fork Watershed Association.
- $134,100 (FY2000) Jefferson County Commissioners for cleanup of 2,080 tons of waste from two illegal dump sites in Knox Township, one of which drains to Indian Camp Run and one of which flows to Redbank Creek, to seed and mulch 4 acres currently covered by these dumps and stabilize 400 feet of streambank.
- $149,570 (FY2000) to Armstrong/Jefferson/Clarion/Clearfield County Conservation Districts for a site assessment of the Redbank Creek watershed. Agricultural BMPs will also be installed the impaired Hulings Run. A variety of conservation measures will be provided included stream crossing, stream fencing, riparian buffers and water control structures.
- The Bureau of Oil and Gas Management has received funding for expansion of their orphan oil and gas wells plugging program (FY1999). A portion of this will be spent in this subbasin

US EPA Clean Water Act Section 319 Grants:

- $38,166 (FY2001) to Headwaters Charitable Trust to investigate an abandoned mine discharge upwelling through fractures in the stream channel of Beaver Run. The location of the discharge will make remediation difficult; therefore, a special treatment option must be developed.
- $117,991 (FY1999) to Hedin Environmental for restoration of Beaver Run, a tributary of Redbank Creek, through construction of passive treatment systems on 3 acidic discharges and one alkaline high iron discharge to Beaver Run near Confer, PA. This project area is located upstream of the passive treatment system installed by Hanley Brick Co. in 1998. The proposed treatment system is a limestone amended constructed wetland followed by an aerobic limestone bed. The alkaline discharge, known as the artesian discharge, enters Beaver Run ½ mile downstream of the other discharges.

DEP Bureau of Abandoned Mine Reclamation:

- 10% set-aside program
  - BAMR will deliver 4,000 tons of limestone for an anoxic drain to reclaim a refuse pile in Beaver Run watershed
- Bond Forfeiture Program
  - In the 1990's, DEP BAMR backfilled an open pit at Confer PA using spoil and refuse. The site was not adequately stabilized due to lack of cover material.

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. Choose Subjects/Water Management/Watershed Conservation/Watershed and Nonpoint Source Management/Watershed Notebooks.

Citizen/Conservation groups

- Redbank Creek Watershed Trust
- Headwaters Charitable Trust

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 stream assessments are completed and necessary 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.

Beaver Run Restoration:

Beaver Run watershed once contained a spur of the Pittsburg and Shawmut Railroad Co. Cleaning and loading of coal for transport by the railroad resulted in large piles of coal refuse in the watershed. Surface mining in the 1950's and 1960's further disturbed the area by creating abandoned highwalls, spoil piles, and a large mine pit. Clay for use in manufacturing of bricks was also mined in the watershed.

Hanley Brick Co., former owner of a brick manufacturing plant in Summerville, PA, had several outstanding violations associated with discharges from their clay mines. Hanley had been treating a highly acidic discharge from the Hanley #4A underground clay mine with chemicals until a July 1996 flood damaged their treatment plant. Rather than spending its remaining assets to continue expensive and unreliable chemical treatment, a settlement agreement was reached with DEP in August 1997. The settlement established the Redbank Creek Watershed Trust to finance future remediation projects in the Redbank Creek watershed. The DEP Knox District Mining Office was instrumental in negotiating the settlement. As part of the $2.4 million settlement, Hanley will spend $700,000 on treatment and portal reclamation at two clay mines known as Hanley 4A and Beaver Run. The remaining money will fund the trust. A steering committee consisting of an employee of the PA Fish and Boat Commission and two residents of Summerville were appointed to a committee to oversee the trust and determine what remediation

projects to fund with the trust. Trust fund money may be used in combination with other public or private funds to finance reclamation.

Studies by the DEP Knox District Mining Office identified 10 sources of polluted mine water in Beaver Run watershed. Hedin Environmental conducted a hydrologic unit study of Beaver Run to determine restoration needs in the watershed. Mine drainage to the watershed comes from two separated by the village of Confer, called Confer West and Confer East, and a third pool called the Lower Pool, located downstream of Confer. The Eastern and Western Pools produce acidic water contaminated with elevated levels of iron and aluminum. The Lower Pool is characterized by alkaline or mildly acidic water contaminated with iron.

Beaver Run is designated as a high quality cold water fishery and supports a reproducing population of brook trout upstream of PA Route 36. The quality of Beaver Run is substantially degraded in the village of Confer by inputs of acid mine drainage. These discharges eliminate the native trout fishery and degrade the aesthetic value of the stream with the iron precipitate which coats the stream bottom. Two-thousand feet downstream of Confer, Beaver Run is degraded by an unnamed tributary that is polluted by an artesian flow of mine water discharging from what is believed to be an abandoned well. Thirty-seven hundred feet farther downstream, Beaver Run is degraded by mine drainage flowing from fractures in the streambed. Below this last discharge, Beaver Run flows for 2.2 miles through scenic, forested land to its confluence with Redbank Creek. Beaver Run is not significantly impacted by other nonpoint source pollution.

The Redbank Creek Watershed Trust has funded construction of an automated chemical treatment system at an abandoned clay mine and construction of a passive treatment system in Confer. Long-term operation of the chemical treatment system will be funded through the trust. In 1999, the trust partnered with DEP Bureau of Abandoned Mine Reclamation to reclaim an acid producing refuse pile in Confer. Funding from a FY 1999 319 project will address four other discharges in the Beaver Run watershed. A 319 funded project scheduled to begin in fall 2000 will address treatment options for the remaining untreated discharge in Beaver Run, the mine drainage flowing from cracks in the streambed. A hydrologic assessment will be conducted to determine the source of the discharge and if remediation can be conducted without relocating the stream. Relocation of the stream would be costly (more than $250,000), risky, and may also move the discharge. When remediation of all discharges and refuse pile removal is completed, significant improvement in water quality and return of aquatic life is expected in over 6 miles of lower Beaver Run.

References/Sources of information

- State Water Plan, Subbasin 17, Central Allegheny River. Department of Environmental Protection, June 1979
- USGS Topographic Maps
- 319 project proposals and summaries
- DEP: Watershed Notebooks, Unified Assessment Document, and information from 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

Streams in Subbasin 17C: 303d/305b Listings

Stream	**Stream Code**	**Drainage area square miles**	**Miles Attained**	**Miles Impaired**	**Causes/Sources**
2-**Allegheny River**	42122		24.9 main stem; 16.0 of 14 UNTs	10.1	pH & metals from AMD
3- Fowler Run	51125	3.49		3.4 main stem; 2.9 of 3 UNTs	Metals from AMD
3-**Bear Creek**	49116	63.1	7.4 main stem	3.6	Metals, pH from AMD
4-Silver Creek & 19 UNTs	49168	7.38	All		*EV, upper basin; HQ-CWF, lower basin*
4-South Branch Bear Creek	49141	14.7	1.9 main stem; 11.54 of 10 UNTs	6.7	Cause & source unknown
4-North Branch Bear Creek	49118	16.8	0.6 main stem; 6.11 of 7 UNTs	7.7	Metals, pH from AMD
3-Dunlap Creek & one UNT	49112	1.23	All		
3-Black Fox Run	49082	8.38	4.3 main stem; 2.1 of 2 UNTs	3.4	Metals, pH from AMD
4-Fiddlers Run near upper Hillville & 4 UNTs	49086	2.12	All		
3-Catfish Run	49064	9.6	1.6 main stem; 5. 9 of 6 UNTs	1.0 main stem; 3.2 of 2 UNTs	Metals, pH from AMD
3-Sugar Creek	49035	17.5		5.2	Metals from AMD
4-Pine Run	49049	2.38			
4-Holder Run	49043	3.08			
4-Cove Run	49039	2.13			
4-Hart Run	49037	1.78			
3-Snyders Run	49019	3.78			
3-Huling Run	48997	10.8		0.48** of one UNT	Nutrients from AG
3-**Redbank Creek**	48064	**573**	1.3 main stem; 17.6 of 16 UNTs	0.8**; 13.9 of 14 UNTs	Metals from AMD

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
4-**North Fork Redbank Creek** & 28 UNTs	48851	**98.2**	All		*HQ-CWF*
5-Muddy Run near Schoffner Corner	48994	1.19			*HQ-CWF*
5-Williams Run & one UNT	48992	1.64	All		*HQ-CWF*
5-Bearpen Run	48991	1.80	All		*HQ-CWF*
5-Manner Dam Run & one UNT	48987	2.04	All		*HQ-CWF*
5-Mammy Hi Run & one UNT	48975	5.02	All		*HQ-CWF*
6-Hetrick Run & 2 UNTs	48978	2.19	All		*HQ-CWF*
6-Davis Run & one UNT	48976	1.20	All		*HQ-CWF*
5-Lucas Run	48972	3.07			*HQ-CWF*
6-Swede Run & one UNT	48973	1.14	All		*HQ-CWF*
5-South Branch North Fork Redbank Creek & 3 UNTs	48961	10.8	All		*EV*
6-Beaver Meadow Run & 2 UNTs	48965	3.29	All		*EV*
6-Bushley Run	48962	0.62	All		*EV*
5-Acy Run	48960	0.59	All		*HQ-CWF*
5-Seneca Run & 2 UNTs	48952	6.06	All		
6-Beaver Run near Egypt & 2 UNTs	48953	2.92	All		
5-Windfall Run & 9 UNTs	48934	5.98	All		*HQ-CWF*
5-Clear Run & 9 UNTs	48916	9.81	All		*HQ-CWF*
6-Dice Run	48930	1.07	All		*HQ-CWF*
6-Work Run & one UNT	48922	1.28	All		*HQ-CWF*
6-Clemens Run & 3 UNTs	48917	1.81	All		*HQ-CWF*

Stream	**Stream Code**	**Drainage area square miles**	**Miles Attained**	**Miles Impaired**	**Causes/Sources**
5-Tarklin Run near Sigel & 4 UNTs	48910	3.18	All		*HQ-CWF*
Miller Run	48915	0.97	All		*HQ-CWF*
5-Shippen Run & 6 UNTs	48903	3.38	All		*EV*
5-Craft Run & one UNT	48901	3.12	All		*EV*
5-Pekin Run & 8 UNTs	48878	10.3	All		*HQ-CWF*
6-Burns Run	48879	1.73	All		*HQ-CWF*
5-Red Lick Run & 4 UNTs	48870	3.50	All		*HQ-CWF*
5-Sugarcamp Run near Brookville & 9 UNTs	48857	3.57	All		*HQ-CWF*
4-**Sandy Lick Creek**	48527	**229**	7.5 main stem; 11.7 of 15 UNTs		
5-Coal Run	48844	3.36			
5-Muddy Run at Narrows Creek	48843	1.13			
5-Narrows Creek	48834	7.29		5.9**	Metals from AMD
5-Laborde Branch	48803	16.6		5.0**	Metals from AMD
6-Luthersburg Branch	48807	6.29		3.6**	Metals and other inorganics from AMD
7-Sugarcamp Run near Luthersburg	48809	1.21			
5-Reisinger Run	48799	2.67			
5-Pentz Run	48791	4.79			
5-Beaver Run	48788	1.58			*HQ-CWF, upper basin*
5-Clear Run	48782	3.61			
5-Slab Run	48788	1.97			
5-Wolf Run	48728	25.2			
6-Harveys Run	48757	1.56			
6-Falls Creek		14.0		0.4**	Metals from AMD *HQ-CWF*
7-Kyle Run	48746	2.46		1.3 **	Metals from AMD
7-Beaverdam Run	48734	6.37		5.6**	Siltation from AMD
5-Panther Run & 2 UNTs	48711	1.99	All		
5-Pitchpine Run & one UNT	48707	1.84	All		

Stream	**Stream Code**	**Drainage area square miles**	**Miles Attained**	**Miles Impaired**	**Causes/Sources**
5-Soldier Run	48684	12.7	4.0 main stem; 10.86 of 14 UNTs	2.8 main stem; 3.7 of 4 UNTs	Metals, pH from AMD
6-Fehley Run	48692	1.55	0.4 of one UNT	2.2 main stem	Metals, pH from AMD
6-McCreight Run	48685	1.13	0.9	1.1	Low pH from AMD
5-Trout Run	48669	10.8		10.1	Water/flow variability from natural sources
6-Front Run & 3 UNTs	48672	2.61	All		
5-Schoolhouse Run & 5 UNTs	48662	4.04	All		*HQ-CWF*
5-O'Donnell Run & 2 UNTs	48657	3.71	All		
5-Camp Run	48645	7.33			
5-Fuller Run	48642	1.62			
5-Cable Run	48636	1.02			
5-**Mill Creek** & 33 UNTs	48562	**52.5**	All		
6-Horm Run & 4 UNTs	48595	8.91	All		
7-Keys Run & 2 UNTs	48597	2.21	All		
6-Fivemile Run at South Sulger	48585	7.92	3.1 main stem; 2.6 of 4 UNTs	1.8 main stem 0.6 main stem 0.7 main stem	Nutients and organic enrichment/low DO from Package plants Metals from on-site wastewater Siltation from Habitat modification
6-Little Mill Creek & 14 UNTs	48564	9.81	All		*HQ-CWF*
7-Laurel Run & 2 UNTs	48575	3.37	All		
5-Fivemile Run at Brookville & 17 UNTs	48528	18.2	All		
6-Hunts Run	48543	0.23	All		
6- Swamp Run	48529	4.80	3.81 main stem; 4.2 of 6 UNTs	0.3 main stem	Metals from AMD
4-Coder Run	48504	10.4	3.32 main stem	1.9 main stem; 0.6 of one	Metals, pH from AMD

Stream	**Stream Code**	**Drainage area square miles**	**Miles Attained**	**Miles Impaired**	**Causes/Sources**
				UNT	
5-Campbell Run	48510	2.54	All		
5-Clement Run	48505	2.44		2.6 main stem & 2 UNTs	Water/flow variability from Road runoff
4-Rattlesnake Run	48497	1.70			
4-Simpson Run & one UNT	48493	2.05	All		
4-Welch Run	48486	4.24		4.5 main stem; 2.54 of 4 UNTs	Metals, pH from AMD
4-Runaway Run	48477	3.59		3.7 main stem s; 1.31 of 2 UNTs	Metals, pH from AMD
4-Carrier Run	48475	1.07			
4-Beaver Run at Heathville	48447	6.76		7.9	Metals from AMD *HQ-CWF, upper basin*
5-Eckler Run	48456	1.74			
4-Tarklin Run near Heathville	48438	2.34			
4-Patton Run	48425	2.40			
4-**Little Sandy Creek**	48289	73.2	10.56 of main stem & 22 UNTs	2.5**	Low pH from AMD
5-Middle Branch Little Sandy Creek	48414	2.23		1.4	Low pH from AMD
5-Hickok Run & one UNT	48410	1.62	All		
5-Clutch Run	48396	2.78	All		
6-Hadden Run	48397	3.22	All		
5-Indiancamp Run	48383	5.87			
5-Lick Run	48370	2.67			
5-Big Run	48327	17.7	8.2 main stem; 10.12 of 15 UNTs	2.6 main stem	Metals, pH from AMD
6-McCracken Run	48347	2.78	1.9 main stem; 2.36 of 4 UNTs	0.4 main stem	Metals, pH from AMD
5-Ferguson Run	48313	3.91	2.2 main stem; 1.55 of 3 UNTs	1.1 main stem	Metals, pH from AMD

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
6-Reitz Run	48314	1.70		2.2 main stem; 0.75 of 2 UNTs	Metals, pH from AMD
5-Cherry Run& 10 UNTs	48298	5.56	All		
5-Brocious Run & one UNT	48296	0.67	All		
5-Nolf Run	48290	3.05			
4-Pine Creek & 20 UNTs	48264	12.0	All		
4-Town Run	48226	9.41	3.3 main stem; 8.34 of 10 UNTs	3.2 main stem; 6.57 of 7 UNTs	
4-Middle Run at Fairmount City	48223	1.93	0.9 main stem	1.1 main stem; 1.2 of 2 UNTs	Metals from AMD
4-Long Run	48199	2.53			
4-Leatherwood Creek & 33 UNTs	48138	21.2	All		
5-West Fork Leatherwood Creek	48165	3.70	2.9 of 4 UNTs	0.6 main stem; 2.61 of 3 UNTs	Metals and other inorganics from AMD
5-Jack Run	48154	3.37	1.3 main stem s; 0.4 of one UNT	1.8 main stem; 1.11 of 3 UNTs	Metals from AMD
4-Middle Run at Leatherwood Station & 3 UNTs	48130	2.30	All		
4-Rock Run & 2 UNTs	48125	1.94	All		
4-Wildcat Run	48086	14.1		4.5 main stem; 6.71 of 6 UNTs	Metals, pH from AMD
5-East Fork Wildcat Run	48102		0.8 main stem; 4.01 of 6 UNTs	2.8 main stem	Metals, pH from AMD
5-Fiddlers Run at Diamond & 13 UNTs	48088	5.33	All		

The evaluation of the subbasin under the DEP unassessed waters project has not been completed.

**= Miles impaired are from a pre- 2001 303d/305b list- assessment not completed for the stream indicated.

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. Ohio River=1, Allegheny River=2

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

AG= Agriculture; AMD= Abandoned mine drainage