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Little Toby Creek Priority Watershed Report 2004 Update

Introduction

This is the fourth annual update to the Little Toby Creek Watershed Report, developed by the Knox District Mining Office to update the restoration and monitoring activities occurring in the Little Toby Creek Watershed during 2004.

The Little Toby Creek watershed originates in the village of Coal Hollow, Fox Township, Elk County and flows toward the south to the town of Brockway, and then flows north for a total distance of 23 miles. It enters the Clarion River at Carman, approximately 7 miles south of Ridgway. The 126 square mile watershed is located in a sparsely populated, forested area and is classified as a Cold Water Fishery (CWF). Brockway is the largest community located within the watershed. The majority of the land within the watershed is privately owned. [Link to the Little Toby Creek Watershed Map](#)

Restoration efforts in the watershed have progressed through the construction of the Back Hayes Run treatment system, installation of turbidity curtains in the Hayes Run treatment system, initiation of the construction of the Blue Valley treatment system and fish culture station and the ongoing alkaline addition and treatment system upgrades at Squab Hollow. Future restoration efforts will include continued construction of the Blue Valley treatment system and fish culture station project, ongoing alkaline addition and treatment system upgrades at Squab Hollow, application for funding for expansion of the Brandy Camp Treatment System, continued reclamation of abandoned mine lands, and continued water quality monitoring by the Knox DMO staff.

Activities (January 1, 2004 – December 31, 2004)

Hayes Run

The Hayes Run treatment system was constructed in 1997 under a cooperative effort between NRCS and the Knox DMO and consists of an aeration channel, settling basin and wetland pond. Headwaters Resource Conservation and Development Council, Inc received a \$44,000.00 Section 319(h) Nonpoint Source Management Grant to address inefficiencies of the existing AMD treatment system on Hayes Run. Ten turbidity curtains were placed perpendicular across the width of the settling basin in order to increase the residence time of flow within the existing system to increase retention time for iron deposition.

Back Hayes Run (LT-11)

Headwaters Resource Conservation and Development Council, Inc, acting as a sponsor for the Toby Creek Watershed Association, received a \$275,000.00 Growing Greener grant for the design and construction of a passive treatment system to treat the Back Hayes Run mine discharge site. Additional funding was provided through PL-566, U.S.D.A. Natural Resource Conservation Service (NRCS) and the U.S. Department of Interior, Office of Surface Mining (OSM). The system was completed in 2004 and includes two parallel up flow SAPS, a settling basin, and an aerobic wetland. During construction, a drainpipe was uncovered (believed to be a mine pool drain) that increased the flows at the main discharge (KRU15) to maximum capacity for the system as designed. Excess flow encountered is currently being piped into a constructed waterway from an overflow pipe, because the as built free board in the settling basin is inadequate with the increased flows. An additional flume will be built from the settling basin as soon as weather permits in 2005 to provide additional free board and prevent water from overtopping the basin during precipitation events. Sampling at the Back Hayes Run is ongoing and water quality data from this site will be evaluated in the 2005 Update.

Brandy Camp Treatment Facility and Blue Valley Fish Culture Station Project

The TCWA received a \$1,100,000 Growing Greener grant to treat a 300gpm alkaline mine discharge and use the treated water as influent water for a fish culture station to raise approximately 200,000 stocking trout annually. BAMR has committed \$200,000 to the construction of the facility, and the PA Fish and Boat Commission is authorized to spend \$1.6 million on the project. Approximately \$4,000,000 is needed to fully fund this project. The site currently contains a passive aeration channel, retention pond, and wetland. The proposed treatment system would include a collection sump to intercept the water (containing 15-20 mg/l of iron) from the mine portal discharge. The water would then be heavily aerated to increase iron precipitation and the dissolved oxygen concentration and then flow into a settling unit. Filtration through a greensand filter may be necessary to achieve total iron levels < 0.1 mg/l. The water would then flow into the fish culture station. An effluent treatment system will also be installed to treat the fish culture station effluent. The project proposes that the Pennsylvania Fish and Boat Commission (PFBC) will operate this facility once it is on-line. Construction of the passive treatment system began in 2004, and completion is contingent upon funding.

Sweet Soil, Inc. - Squab Hollow

BAMR is working with Sweet Soil, Inc. to remediate AMD at the Squab Hollow site, located on Benninger Creek (a tributary to Brandy Camp Creek). The project has resulted from a pilot study completed in the East Branch Clarion River Watershed in 2003. Plans include the application of alkaline residuals from Weyerhaeuser (the local paper mill) to previously mined land containing acid forming materials. The residuals will neutralize the acid forming material causing water pollution and minimize the need for perpetually treatment.

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Two discharges (A&B) high in manganese concentrations have resulted from mining in this area. A series of treatment systems were installed to remove the manganese and are currently being modified to increase efficiency. In 2003, BAMR performed a terrain conductivity study at the Squab Hollow site to pinpoint the major acid forming sources, while incorporating the alkaline residuals with the surface material onsite. During 2004, BAMR monitored the current treatment systems and continued applying the alkaline residuals from Weyerhaeuser. Water quality data collected on the A and B discharges has shown significant decreases in manganese concentrations. The improved manganese removal is attributed to both the alkaline residual addition and treatment system improvements. A second pond was constructed as part of the manganese removal system on discharge B and will be studied in the spring of 2005.

For a complete list of treatment systems in the Little Toby Creek Watershed see [Appendix A](#).

Mining Activities

During 2004, there were two new surface mining permits issued and twenty previously issued permits in the Little Toby Creek Watershed:

Amfire Mining Co., LLC, Permit No. 24030103, Horton Township, Elk County. On July 15, the Knox DMO issued this surface mining permit that includes 25 acres of abandoned mine lands. Amfire will remine an abandoned coal refuse pile and reclaim 3800 feet of highwall. Reclamation activities include alkaline addition and will reduce the sediment load in the receiving streams.

Northstar Aggregates, Permit No. 24042801, Horton Township, Elk County. 10,000-ton industrial minerals sandstone permit.

The following active surface mining permits were issued before 2004 the Little Toby Creek Watershed: Fairview Coal Co. (Permit Nos. 24980104, 24930102, 24980106, 4674SM8, 24743008); Tamburlin Brothers Coal Co., Inc. (Permit Nos. 24980105, 24673003, 24870101, 24920101, 24980102, 24990102, 24000101); Energy Resources, Inc. (Permit Nos. 24990101, 24010101, 24980106, 24890101, 24900102, 24900103, 24970101, 24970102, 24970103, 24980101); Hepburnia Coal Company (Permit No. 24020104, 24050104); Amfire Mining Co., LLC, Permit Nos. 33020104, 24030103, 24820107; Rosebud Mining Co., Permit No. 24991304; and Superior (Permit No. 24020104),

Surface Mine Conservation Inspectors from the Knox DMO inspect all of these active mine sites on a monthly basis. An update on the status of these permits, along with the currently issued permits will be included in next years Update.

Water Quality Indicators

Key stream monitoring points being evaluated for this year's update include:

SP#2 Little Toby Creek above Kyler Run - below Largy, Limestone and Little Plant
KR10 Mouth of Kyler Run
LT91 Little Toby Creek below confluence with Hayes Run
LT11 Little Toby Creek above Brandy Camp Creek
BC21B Brandy Camp Creek below the Brandy Camp Treatment System
BC10 Mouth of Brandy Camp Creek
LT400 Little Toby Creek above confluence with Rattlesnake Creek

The following is a short outline of water quality or monitoring at the various locations throughout the Little Toby Creek Watershed. For a complete listing of water quality: [Link to Monitoring Point Descriptions and Water Quality Data.](#)

SP#2 – Water quality at the headwaters of Little Toby Creek above its confluence with Kyler Run has an average pH of 5.2, net acidity with high levels of iron, manganese and aluminum.

KR10 – Since the installation of the Kyler Run treatment system in 2003, water quality below the system has shown significant improvement. Water quality at the mouth of Kyler Run hasn't shown significant improvement due to a large deep mine discharge (with flows equal to that captured by the treatment system) that is being diverted around the treatment system and to the stream untreated. Data collected in 2004 shows an average pH of 4.7, 8.6 mg/l of alkalinity, 57 mg/l of acidity, 5 mg/l of iron, 4.9 mg/l of manganese and 4.5 mg/l of aluminum. Back Hayes Run treatment system was completed in 2004, but it is unlikely that significant water quality improvement will be realized at this point until the untreated discharge above the Kyler Run Treatment System site is addressed.

LT91 - The water quality below the Hayes Run and Gavazzi treatment systems exhibits an average pH of 5.1, net acidity and elevated levels of iron, manganese and aluminum. Improvements in iron retention from the installation of turbidity curtains in the Hayes Run treatment system have not yet been realized. The Gavazzi treatment system (LTU82D) is effectively removing more than 99% of the iron, manganese and aluminum from the deep mine discharge (LTU82) on the unnamed tributary to Little Toby Creek upstream from LT91.

LT11 - increasing trends in pH and decreases in iron and aluminum have been documented in Little Toby Creek above its confluence with Brandy Camp Creek.

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BC21B – Brandy Camp Creek has an average pH of 5.6 with elevated levels of iron, manganese and aluminum below the Brandy Camp treatment system. The flows at this discharge have increased by 500 gpm, since the treatment system was constructed. The TCWA is applying for a Growing Greener Grant in 2005 to increase treatment efficiency by installing additional clarifiers.

BC10 – pH and alkalinity have increased and iron, manganese and aluminum concentrations have decreased at the mouth of Brandy Camp Creek. Improvements in the water quality can be attributed to the Brandy Camp, Blue Valley (BCU11, BCU11B, BCU10), and Elbon (BCU6, BCU6B) treatment systems upstream from BC10. The construction of the proposed Brandy Camp Treatment Facility and Blue Valley Fish Culture Station Project will significantly reduce the amount of iron being discharged into Brandy Camp Creek.

LT400 – Little Toby Creek above the confluence with Rattlesnake Creek has shown an increasing pH and alkalinity while levels of iron, manganese and aluminum remain low. Water quality collected in 2004 has shown an increase in acidity, which could be attributed to the higher than normal flows documented throughout the year.

Total Maximum Daily Load

A Total Maximum Daily Load (TMDL) represents the total amount of pollutants that a body of water can assimilate without causing water quality standards to be exceeded. Section 303(d) of the Clean Water Act requires states to identify, list and prioritize all waters that do not meet water quality standards, even after pollution controls required by law are in place. TMDLs must be established for these waters to ensure attainment of water quality standards.

There have been no TMDLs developed for the Little Toby Creek Watershed. Curry Run, a tributary to Little Toby Creek, was listed on the 1996; 303(d) list for being impaired by Abandoned Mine Drainage (AMD). The Knox District Mining Office began working on the TMDL for Curry Run in October 2001. Water quality sampling and a more recent biological survey indicated that Curry Run was no longer impaired by AMD. In 2002, Curry Run was removed from the 303(d) list; therefore a TMDL is not required. Little Toby Creek and Johnson Run (a tributary to Little Toby Creek) are on the 1996; 303(d) list and are scheduled for TMDL development in 2007 with sampling scheduled during 2005 and 2006.

Future Activities

The TCWA continues to lead the efforts in the restoration of the Little Toby Creek watershed and the Knox District Mining Office (DMO) continues to monitor the water quality. The TCWA is soliciting funds for the fish culture station demonstration project (approximately \$800,000), fine tuning the operation of the Kyler Run treatment system and preparing a grant application for the installation of additional clarifiers for the

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Brandy Camp treatment system. The TCWA and partners will take the lead in the operation and maintenance (O&M) on the existing treatment systems where BAMR is not committed to maintaining. BAMR continues to maintain the Brandy Camp treatment system and the Little Toby Creek Limestone Plant and Little Plant. HCT will install a second flume/outlet structure from the settling pond at Back Hayes Run treatment system.

The Knox DMO Little Toby Creek Priority Watershed Team will continue to meet quarterly to review system performance, assist in planning, monitoring, and project development activities. Team members are Sherry Carlin, Ely Heferle, Joe Ferrara, Doug Caylor, Doug Stewart, Barb Hajel, Jim Sennett, Mark Benson, George Traister, Chris Yeakle, Mike Johnson, and Larry Alexander.

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Appendix A

Little Toby Creek Watershed Treatment Systems

Treatment System Name	Upstream MP#	Downstream MP#	Funding Source(s)	Funding Amount	Organization	Treatment System Design	Date Placed Online
Little Plant		SP#3	Project Scarlift		BAMR	Water Wheel Powered Limestone-Pulverizing Drums	November 1996
Kyler Run	KRU41	KR10	Round 2 Growing Greener PL-566	\$1,299,480.00 \$360,520.00	TCWA NRCS	SAPS, Aerobic Wetlands Settling Ponds	November 2002
Largy		SP#E	EPA 319 Grant		NRCS	Buried Limestone Collection System, Retention Pond, Cattail Bog	1998
Limestone Plant	SP#B	SP#6	Project Scarlift		BAMR	Downflow Limestone Beds, Water Wheel Powered Limestone-Pulverizing Drums	November 1996
Hayes Run	HR20	HR20A	EPA 319 Grant	\$44,000.00	HCTF	Wetlands 2002 Upgrade: Turbidity Curtins Wetland Plantings	1998
Back Hayes Run (LT-11)	KRU17	KR10	Round 4 Growing Greener	\$275,000.00	HCTF TCWA	2 SAPS, Settling Basin, Aerobic Wetland	Fall 2004
Brandy Camp	BC21	BC21B	Round 2 Growing Greener	\$796,784.00	TCWA	2002 Upgrade: Inclined Plate Clarifier Hydrated Lime Doser, Polymer Addition Sludge Storage Tank, Belt Filter Press	December 2002
Blue Valley	BCU11	BCU11B			NRCS	Aeration Channel, Retention Pond, Wetland Bog	1997
Mead Run		MRSTA1	Rec-in-lue		HCTF	Pyrolusite AMD Treatment System:	1996
Gavazzi (LT-20)	LTU82	LTU82A	DEP 104-15, USDI-OSM Watershed Cooperative Agreement Program	\$178,579.20	TCWA BAMR	Wetland, 2 Treatment Beds, Settling Basin	1999
Elbon	BCU6	BCU6B	EPA 104-15, 319, USDI-OSM		TCWA	2 SAPS, 2 Settling Basins	2000