

Kettle Creek Watershed Association News

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Preserve
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May 2013

Swamp Area Passive Treatment System Completed

Construction of a large passive treatment system, referred to as the Swamp Area passive treatment System, was completed in November 2012. This treatment system addresses the first flow of abandoned mine drainage (AMD) into Twomile Run, a tributary to the lower Kettle Creek in Clinton County. Above this source of AMD pollution, Twomile Run is designated as a Class A native brook trout fishery.

The Swamp Area passive treatment system is a major component of the comprehensive restoration effort for the Twomile Run subwatershed and lower Kettle Creek. Additional passive treatment systems that have been constructed in the Twomile Run subwatershed include the Middle Branch passive treatment system and five smaller, individual passive systems that together comprise the Robbins Hollow headwaters passive treatment system complex. Yet another passive treatment system is currently under construction that will address AMD discharges that pollute Robbins Hollow downstream of this headwaters passive treatment system complex.

Back in 2005, a 57-acre surface reclamation project was completed that accomplished the regrading and revegetation of an old “moonscape” of an abandoned surface mine. This project successfully reduced the production of AMD flows from this site and made the use of passive treatment technology feasible to treat the remaining flows of AMD — which led to the construction of the Swamp Area passive treatment system.

The treatment system consists of four vertical flow ponds (ponds that contain a layer of organic compost and limestone), a settling pond, a drainable limestone bed (a pond containing limestone that is set to flush on a regular basis), and two wetlands. This system was designed to treat AMD with an average pH of 3.0 and average concentrations

35 mg/L aluminum, 75 mg/L iron, and 430 mg/L of acidity as CaCO₃. The average design flow is 74 gallons per minute, but the system can accommodate flow up to 300 gallons per minute.

The total cost for the initial assessment, design, permitting, and construction of the Swamp Area passive treatment system was just over \$1 million.

Grants were obtained from the PA Department of Environmental Protection Growing Greener Program, Office of Surface Mining, National Fish and Wildlife Foundation, Richard King Mellon Foundation, and the Foundation for PA Watersheds.

In-kind services were also provided by the PA Department of Conservation and Natural Resources for access road construction. The system was designed by Hedin Environmental, a private consulting firm based in Pittsburgh, PA, and the construction contract was awarded to Smith Excavating and Construction LLC in Renovo, PA.

Trout Unlimited professional staff will monitor the system on a routine basis and will begin sampling aquatic insects and fish in Twomile Run downstream of the system to begin documenting biological recovery.



Aerial view of Swamp Area passive treatment system from Google Earth.

KCWA Board

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“Three-Fingered Devil” Reclamation Project - Still No Contract Awarded

The reclamation of approximately 100 acres of nearly barren, abandoned strip mine in the Huling Branch and Middle Branch drainages of the Twomile Run watershed (referred to as the “Area 7” or “Three-Fingered Devil” project) is the first of several reclamation projects that has been in planning for more than four years. A variety of factors have delayed the implementation of this critical project, but the most recent circumstance was that the PA Department of Environmental Protection (DEP) did not receive any bid proposals for the most recent attempt to get things underway. Purportedly this is the first reclamation project ever for which the DEP did not receive any bids. The DEP recently rebid the project with proposals due on May 16, 2013.

The original plan for this reclamation project, along with the other projects slated for reclamation in the Huling Branch subwatershed, was identified and developed by Hedin Environmental in the 2007 Twomile Run AMD Master Remediation Plan. Initial cost estimates for this specific project were in the range of \$2 million to \$4 million, however the DEP made a number of technical changes to the project that greatly increased the cost, which is now upwards of \$9 million. Nevertheless, the KCWA and Trout Unlimited are hopeful that DEP receives good bids and can proceed with a project that will result in significant water quality benefits.

While the remediation of Twomile Run and its tributaries upstream of the confluence with Huling Branch is nearly complete, land reclamation of the old strip mines is the critical last piece to restoring the rest of Twomile Run, as well as providing substantial water quality benefits to the lower reaches of Kettle Creek and ultimately the West Branch Susquehanna River.

Since part of the Whiskey Springs ATV Trail System that is managed by the DCNR Bureau of Forestry is within this reclamation project area, it is likely that at least a portion of the trail system will be closed during construction. Individuals should contact the DCNR Bureau of Forestry Sprout State Forest office in Shintown for more information. Also, stay posted for a public informational meeting on this project and the other mine drainage projects in the lower Kettle Creek watershed that Trout Unlimited is planning to host in Renovo sometime in June 2013.



This photo shows a much cleaner Twomile Run, as a result of the recently completed Swamp Area passive treatment system and other treatment systems completed thus far, with Huling Branch entering Twomile Run from the left. The Area 7 reclamation project will help to restore water quality in Huling Branch.

Message from the KCWA President

Our watershed group is now in our 16th year. We have accomplished a lot, but we have much more to do. Trout Unlimited has rejoined our efforts to finish the stream work in the upper Kettle and in Cross Fork. More on that later.

Long time board members John Larson and Dean Mertz resigned their board memberships due to health concerns after many years of dedicated service. John was our chair and president, involved in everything, and Dean chaired our Acid Mine Drainage Committee and was there to help with most of our stream projects. Rich Wykoff, our main photographer and most recently, secretary of board also resigned, as did Joe Letcher. Brian Burger has also resigned as he will be moving. Thanks guys for all of your hard work.

Dave Cardellino and his volunteers planted more than 2,500 trees in the watershed last April and May. Most were planted in the tree tubes, which we hope will save the trees from harm until they grow larger.

This past summer, we revisited the Twin Ponds stream reach (½ mile downstream of Cross Fork) to extend the “mud sill” that was originally built in 2007, but partially destroyed during the November high water of 2009. Funds were donated by Dominion Corporation and from an anonymous source, and with help from our treasury. Dave Keller and his crew from the Habitat Management Section of the Pennsylvania Fish and Boat Commission did the construction. Volunteers from TU, the Clinton County Conservation District, Buckkill Camp, KCWA, and the Kissells used their backs to set logs and replant the

area.

Last fall, Trout Unlimited’s Amy Wolfe, and KCWA board members Terry Murty, Ken Klanica and I met with John Arway, Executive Director of the PA Fish and Boat Commission and his senior staff at the commission office in Pleasant Gap. We wanted to inform him of what has been done in the watershed to date, and to ask what our working relationship with them will be in the future.

Their funds are limited and they want to use those funds in the most efficient manner. A major change in the way the Habitat Management crews will be assigned was announced. Rather than working on small areas in many streams throughout the state each year, they will choose a watershed that has the highest need and work on it until it is completed. This may take a year or so with each watershed. I like the concept because it saves time and money by not having to move machinery and crews from one place to another during the June 15 to October 1 timeframe when they do their stream construction. The problem for us is that we have a watershed in relatively good condition and it may be years before ours is worked on. We will see.

On a bright note, the PA Fish and Boat Commission is still sitting on \$2.3 million from the lawsuit over the Norfolk-Southern train spill in Portage Creek, and that money must be spent in Potter, Elk, Cameron and Tioga counties. Perhaps private contractors will be hired for projects in our watershed funded by that money.

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Photo shows the severe streambank erosion at the Twin Ponds project site on Kettle Creek prior to installation of a mud sill in August 2012.



The mud sill will help to provide habitat and cover for trout during the warmer months of the year when low flow and higher water temperatures are of concerns. In combination with the regraded streambank, the mud sill will also provide additional bank stabilization.

Message from the KCWA President (continued)

On a brighter note, Amy Wolfe of Trout Unlimited has received a grant from the National Fish and Wildlife Foundation to finish the work started years ago in the Cross Fork watershed. She has hired Jake Tomlinson, a professional staff person to work on that project. Of primary concern are the stream dimensions (width, depth of water), the riparian features (amount of shade and bank conditions), and the amount of dirt runoff from the roads that parallel the stream. The end result will be sanctuary and cooler conditions for our trout and aquatic insects.

We received word from Eli Long, Watershed Manager at the Western Pennsylvania Conservancy that following a Brook Trout Assessment in the Upper Kettle they will be working with us to plant trees and do habitat construction. They have also received a grant from the National Fish and Wildlife Foundation.

A retreat was held at the Bald Eagle Nature Inn on Sayers Dam near Howard on Saturday and Sunday, March 2nd and 3rd for members of

our board and some professional staff members from TU and County Conservation Districts. The workshop was led by Michael Kumer, of Boards Made To Order in Pittsburgh. Amy received a grant from the Chesapeake Bay Funders Network to fund the event. Our quarterly board meeting followed the workshop.

If you are aware of a section of water in the watershed that is in need of attention due to stream bank erosion, lack of overhead cover (shade), or has pollutants entering the water from fracking or other sources, contact one of our board members or email to ktlcrik@gmail.com and we will look into the problem. If you don't like what we are doing, tell us - if you do, join us! Are you interested in serving as a volunteer planting trees, constructing stream devices or as a board member? We can use your talents and your membership dues.

Richard Sodergren
Pres/Chair, KCWA

Maintenance on the North Branch Robbins Hollow Passive Treatment System Successfully Completed

In November 2012, the first-ever maintenance project was completed at the North Branch Robbins Hollow passive treatment system, which is a small treatment system that went online in 2004 within the Robbins Hollow headwaters passive treatment system complex. Limestone from the two vertical flow ponds was removed and washed and new organic compost (to replace the spent compost) was added to the two vertical flow ponds. The cost for the project was \$29,495 with funding provided by a grant from the PA Department of Environmental Protection Growing Greener Program.

It was typically thought that passive systems, after installed, would require complete replenishment of the limestone and organic compost after a decade or so (depending on the size of the system and the water quality being treated). It is now understood (through work conducted by Hedin Environmental) that cleaning the limestone to remove the metal precipitates, which over time coat the stone and render it less effective at generating alkalinity (raising the pH), will not only ensure continued performance of the passive system, but also help to extend the overall life expectancy of passive systems.

Also, it is important to replenish the limestone and organic compost as they become used up. Closely monitoring the water quality from the vertical flow ponds and other treatment components of passive systems will help to determine when these periodic maintenance activities are necessary and allow for advance planning to secure the funding and schedule the maintenance.



Because the vertical flow ponds were built in parallel, flow into one vertical flow pond can be turned off to allow for washing the limestone from that pond while the AMD continues to flow through and be treated by the second vertical flow pond. This is an important design consideration of passive systems so that AMD can be treated continuously, even while maintenance activities are being conducted.

Member Profile — Mary Hirst

Most of you know Mary Hirst. She lives in Oleana with her husband Larry, and has been a member of the board of the watershed since it began in 1998. She has served as our membership chair and served a term as the chair of the board.

A native of Milesburg, Pa., Mary has lived in the valley for 16 years. After graduation from Bald Eagle High School, and Thiel College, she began her career with the Department of Conservation and Natural Resources - Parks, and now serves as Park Manager at both the Ole Bull and Kettle Creek State Parks.

She is a busy lady. In addition to her roles with the watershed, she volunteers her time as a



member of Kettle Creek Hose Company and as an EMT and vice president for the Kettle Creek Ambulance Association. She volunteers her time assisting with the fire company breakfasts, the Kettle Creek Music Festival and the Kettle Creek Valley Outdoor Show each year which are fundraisers for those organizations that provide critical health and safety roles

to the residents and visitors of the valley.

She also organizes the Kids Fishing Derby at Ole Bull State Park each June. An avid bird-watcher, she is the president of the Potter County Bird Club.

Thanks Mary and Larry for all you do for the well being of all of us and the fish in the stream.

Construction of a New Passive Treatment System Underway

Reclamation and remining, wherever and whenever possible, are always the preferred option instead of treatment. Under the most aggressive reclamation and deep mine removal scenario it may be possible to eliminate or reduce the remaining Robbins Hollow discharges to insignificance; however the reclamation to accomplish this has been estimated to cost \$2.9 million. Anything less than this effort will leave behind AMD that will require treatment. Since it is highly unlikely that a \$2.9 million project will be funded to completely eliminate the remaining discharges, the proposed Robbins Hollow 10A-10B passive

treatment system becomes a critical component in the overall restoration strategy for Twomile Run.

The main objective for treatment of the Robbins Hollow discharges is to reduce the acidity and metals loadings and to add alkalinity to Twomile Run so that it can be restored to a native brook trout fishery along its entire length. This system, in combination with the water quality benefits provided by the other passive treatment systems in the Twomile Run subwatershed, will help to accomplish this goal.

This project, designed by Hedin Environmental, will consist of two small, individual passive treatment systems that each contain a drainable limestone bed and settling pond. The construction contract was awarded to Smith Excavating and Construction LLC in Renovo. Grants have been obtained from the PA Department of Environmental Protection Growing Greener Program, National Fish and Wildlife Foundation, and Richard King Mellon Foundation, with another grant currently pending from the Office of Surface Mining. Construction should be completed sometime this summer.



Future site of treatment system.

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Address Correction Requested

Eastern Brook Trout Genetic Research Underway in Twomile Run

It is well known that Eastern brook trout have been declining throughout their native range due to the degradation of habitat and water quality. For the most part, this species has become confined to the extreme headwaters of watersheds that they inhabit. Many efforts are underway to conserve, protect, and restore the Eastern brook trout throughout the eastern United States. These efforts typically include improving habitat and water quality.

One area of restoration that has been given more attention recently is the removal of barriers to fish movement. While this has always been important for anadromous fish like salmon that are known to make long migratory movements, the importance of movement for species like brook trout is starting to be realized by fisheries biologists. Barriers to movement include the obvious obstacles in a stream like dams and poorly designed road culverts. However, water quality pollution such as AMD can also become a barrier to fish movement. AMD, and all barriers to fish movement, can create populations of fish that are isolated from one another.

Isolated populations of brook trout, or any animal species, often results in what scientists call a genetic bottleneck, or a decrease in genetic diversity (the amount of genetic variation in a population). The presence of movement barriers in a stream do not allow fish from one population to interbreed with other populations, thus limiting the amount of genetic diversity or variation within the isolated population. Similar to biodiversity in an

environment, high genetic diversity is more desirable in populations as it helps to protect the species from the negative impacts of disease, a changing environment, and other stressors that have detrimental impacts.

Researchers are currently working to determine how much genetic diversity exists within brook trout populations. Trout Unlimited's Eastern Abandoned Mine Program, in collaboration with Grove City College, began working toward that goal in the Twomile Run subwatershed of Kettle Creek and have expanded it throughout the West Branch Susquehanna River basin. Trout Unlimited staff collect fin clip samples from brook trout electrofishing surveys throughout the watershed that are then sent to Grove City College for analysis.

These data should provide a snapshot of the genetic diversity that exists in brook trout populations throughout the watershed and provide useful information for the future management of brook trout in this area.

In addition, this type of research can also be useful for assessing the success of restoration work that has the goal of removing movement barriers. By collecting genetic data from isolated populations both before and after a barrier is removed, the genetic make-up of the two populations should begin to look more similar over time after the barrier is removed. Overall, Trout Unlimited hopes this research will allow future restoration work to focus on areas where the genetic diversity of brook trout could be increased by reconnecting existing populations and help to conserve and protect this species for generations to come.