

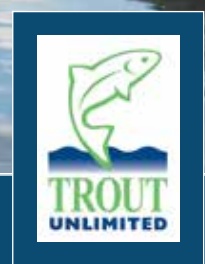
A DECADE OF PROGRESS FOR THE

West Branch Susquehanna Restoration Initiative

2004–2014



A. WOLFE



Foreword

PA Fish and Boat Commission Executive Director, John Arway

PA FISH AND BOAT COMMISSION



In 2012, Pennsylvania Fish and Boat Commission (PFBC) staff surveyed the upper reaches of the West Branch Susquehanna River in Cambria County and discovered a naturally reproducing wild trout population. The abandoned mine drainage (AMD) remediation efforts, including the Lancashire 15 treatment plant, have improved water quality to the point where there are now wild trout in the West Branch! With the recently funded Twomile Run project in the lower Kettle Creek watershed and proposed remediation at the abandoned Fran Contracting site in the Cooks Run watershed, there is a great potential to recover significant miles of naturally reproducing brook trout streams in the near future.

Another major recent accomplishment is the AMD remediation work that improved water quality in more than forty miles of the Bennett Branch Sinnemahoning Creek. The partnership between government, industry and the public working together on reclamation activities and AMD treatment has allowed PFBC cooperative nurseries to stock a portion of the Bennett Branch in 2013, and the PFBC will be adding a preseason stocking to a 4.5 mile reach in the Medix Run/Benezette area for 2014. Additionally, a 2.8 mile section of the West Branch near Curwensville will receive a preseason trout stocking for the first time in 2014.

These are some exciting times in the West Branch Susquehanna watershed and we look forward to more improvements in the coming years. Some measure societal progress in miles of highways or numbers of shopping malls. I believe that the accomplishments that we have made are a true measure of progress and testament to the hard work and dedication of all those individuals who have contributed to these efforts. Thanks from the trout and let's keep the momentum!

West Branch Susquehanna River Watershed

The West Branch Susquehanna River watershed covers approximately 7,000 square miles of mostly forested land in central and north-central Pennsylvania. About half of the land is publicly accessible through state forest, state park, and state game lands and 75-percent of this watershed is within the PA Wilds, a region designated for the abundance of outdoor recreation opportunities it offers. Although hundreds of streams offer some of the best trout fishing found anywhere in Pennsylvania, there are hundreds more streams that could be added to that list if abandoned mine drainage (AMD) was completely cleaned up. Coal mining that occurred prior to 1977, when federal regulations were put in place that required mining companies to restore the land and treat any resulting mine drainage, left behind huge swaths of scarred lands and streams so polluted they could not support any aquatic life. Nevertheless, many of the AMD polluted streams have excellent habitat that would support fish and other aquatic life with an improvement in water quality. Also, many of the polluted streams already contain healthy fish populations upstream of the AMD pollution so that once the AMD is cleaned up, the aquatic insects and fish will return. In fact, they are already returning to the river and other streams where water quality improvements are being made.

The West Branch Susquehanna Restoration Initiative

Trout Unlimited (TU) established the West Branch Susquehanna Restoration Initiative in 2004. With

funding support from the Richard King Mellon Foundation, TU developed this initiative to focus on the restoration of AMD-polluted coldwater streams and the ultimate recovery of

the West Branch Susquehanna River. While TU is the lead catalyst, there are dozens more organizations and agencies that help to drive the success of the West Branch Susquehanna Restoration Initiative including multiple government agencies, volunteer organizations, municipalities, conservation districts, private industry, and others. Over the past decade, more than \$113 million has been spent through various state and federal grant programs and other funding sources to address AMD pollution in the watershed.



Native brook trout are returning to many coldwater streams as a result of successful AMD treatment.



Abandoned mine drainage often pollutes streams with acidity and toxic metals such as aluminum (white) and iron (red).



Collaboration and partnerships are critical to the successful recovery of the West Branch Susquehanna watershed.



Since 2005, Trout Unlimited has provided technical expertise to numerous groups throughout the watershed on more than 50 projects through its free AMD Technical Assistance Program.

The Reason behind the Success — Collaboration and Partnerships

With overwhelming support from the commonwealth, the Pennsylvania Department of Environmental Protection (DEP) created the West Branch Susquehanna River Task Force in 2004 to bring together all government agency stakeholders and statewide and regional conservation organizations in support of restoring the West Branch Susquehanna River basin. Then in 2005, TU hosted the first West Branch Susquehanna Restoration Symposium to publicly launch the AMD cleanup initiative. Stemming from facilitated roundtable discussions at the symposium, the West Branch Susquehanna Restoration Coalition was established to represent conservation districts, watershed associations, TU chapters, and other community stakeholders interested to collaborate on restoring the watershed. Today that coalition represents more than 60 volunteer-led watershed associations, conservation districts, conservation organizations, businesses, and other entities that support the restoration of the West Branch Susquehanna watershed.

Maintaining the Momentum through Symposiums

Between 2005 and 2014, seven West Branch Susquehanna Restoration Symposium events were held. On average, over 110 people participated in each event representing government agencies, watershed and sportsmen associations, conservation organizations, academic institutions, private industry, and local elected officials. The symposium serves as a forum for the exchange of ideas regarding AMD abatement in the region and provides an excellent opportunity for networking among volunteers, policy makers, technical experts, students, and others interested in restoring land and water impacted by AMD. The symposium also offers tours to local AMD project sites and/or workshops to help build the capacity of the groups working to restore AMD polluted streams in the watershed.

▼ Students learn about AMD at an annual education event sponsored by the Beech Creek Watershed Association.

Educating the Next Generation of West Branch Susquehanna Stewards

Many watershed organizations, TU chapters, and conservation districts coordinate programs to help develop interest in the outdoors and educate the region's youth on the environment, and in particular on AMD impacts and cleanup. For example, the Clearfield Creek Watershed Association (CCWA) has held an annual Kids Fishing Derby that has attracted up to 150 children at each event. The CCWA also supports Trout in the Classroom programs at several local schools and provides other AMD-related educational and research opportunities to engage college students from St. Francis University and the Pennsylvania State University. TU has also developed AMD and coldwater conservation curriculum and teaching resources for use in grades K through 12 and also provides classroom and hands-on, field education programs to hundreds of students throughout the watershed every year.

A. WOLFE

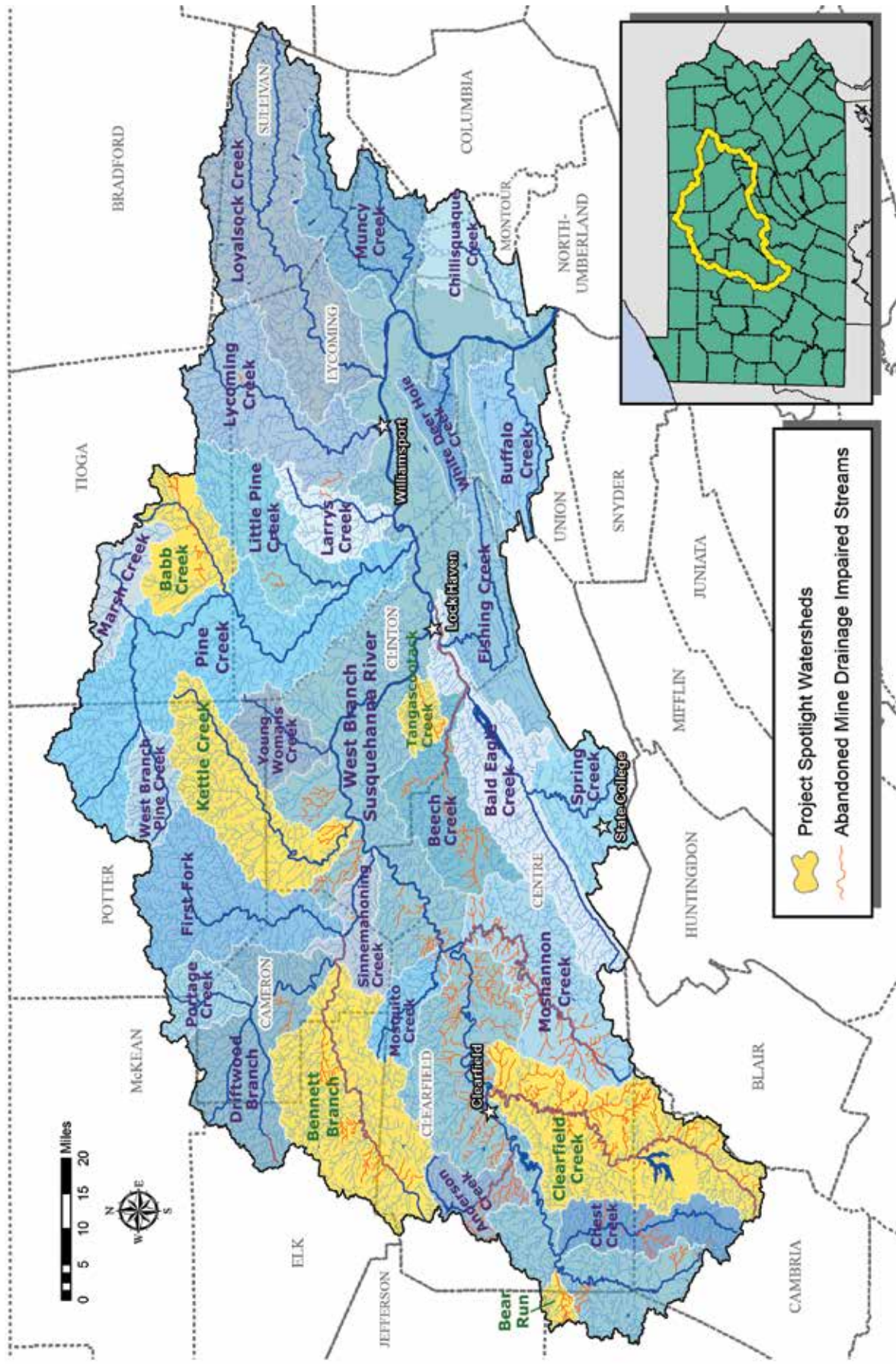


The symposiums offer opportunities for both volunteers and professionals to share information on projects and keep up to date on monitoring techniques and AMD cleanup technology.

R. HOLLER



West Branch Susquehanna Watershed



Project Spotlight

Babb Creek

The effort to restore Babb Creek, a major tributary to the well-known Pine Creek, is one of the longest-running and most successful watershed restoration efforts in the West Branch Susquehanna watershed and across Pennsylvania. The restoration kicked off in 1989 when the Babb Creek Trust Fund was established as a result of the lawsuit that the Environmental Defense Foundation had brought against the Antrim Mining Company, whose active mine was creating additional mine drainage above and beyond the pollution already flowing from over a half-dozen abandoned mine complexes. Since that time, the Babb Creek Trust Fund, as well as grants from a variety of programs, provided the funding for more than a dozen AMD treatment systems and land reclamation projects in the watershed.

The wetland pictured here is part of the Anna S passive treatment system, completed in 2004, which is largely responsible for the recovery of Babb Creek.



A. WOLFE

Fast forward 20 years later to 2009 when the Babb Creek Watershed Association (BCWA), the local organization responsible for spearheading most of the projects, celebrated the recovery of nearly 14 miles of Babb Creek and the reclassification of the stream to a wild trout fishery. The return of self-sustaining fish populations and the formal removal of stream mileage from the state and federal list of impaired waters is certainly the ultimate goal – and it was finally achieved after two decades of persistence and perseverance by the volunteers of the BCWA and professional staff of the DEP and other partners alike.

Despite this great success, the work of the BCWA and its partners is by no means finished. Now they must work to ensure the proper operation and maintenance of the treatment systems that are constantly supplying treated water to sustain the water quality improvements and aquatic life well into the future.

T. CLARK



Photos of the South Branch of Bear Run before treatment (above) and after treatment (below) illustrate water quality improvements in the stream.

Bear Run

In 2008, the Susquehanna River Basin Commission and the Indiana County Conservation District received the first Watershed Renaissance Grant Award from the DEP. The funding was to be utilized to construct the last six phases of the 8-phased Bear Run Restoration Plan. As of 2014, all eight phases have been completed with funding remaining to construct a ninth phase, scheduled for fall 2014, and the design of a tenth phase. The water quality improvements achieved to date have allowed fish populations to return to formerly dead stretches, even allowing native brook trout recolonization in several sections. In 2008, only 16 total fish representing four species were captured in eight sample sites. By 2012, 129 total fish representing 18 species were captured in the same eight stations, with two of those species being native brook trout and wild brown trout.

Bennett Branch Sinnemahoning Creek

Since 2004, the DEP has been working with the Bennett Branch Watershed Association, state and federal agencies, and the mining industry to restore water quality and reclaim abandoned mines in the Bennett Branch Sinnemahoning Creek. The primary water quality problems in the watershed were the result of uncontrolled and untreated discharges of AMD from abandoned mine lands that severely degraded the water quality in the lower 33 miles of the Bennett Branch and many of its tributaries. A majority of the planned work has been completed with the Hollywood AMD treatment plant being the single biggest project. Water quality has been significantly improved to the point where fish are now being stocked in the main stem of the Bennett Branch and fish have returned to the Dents Run tributary for the first time in roughly 100 years.

K. BOBK

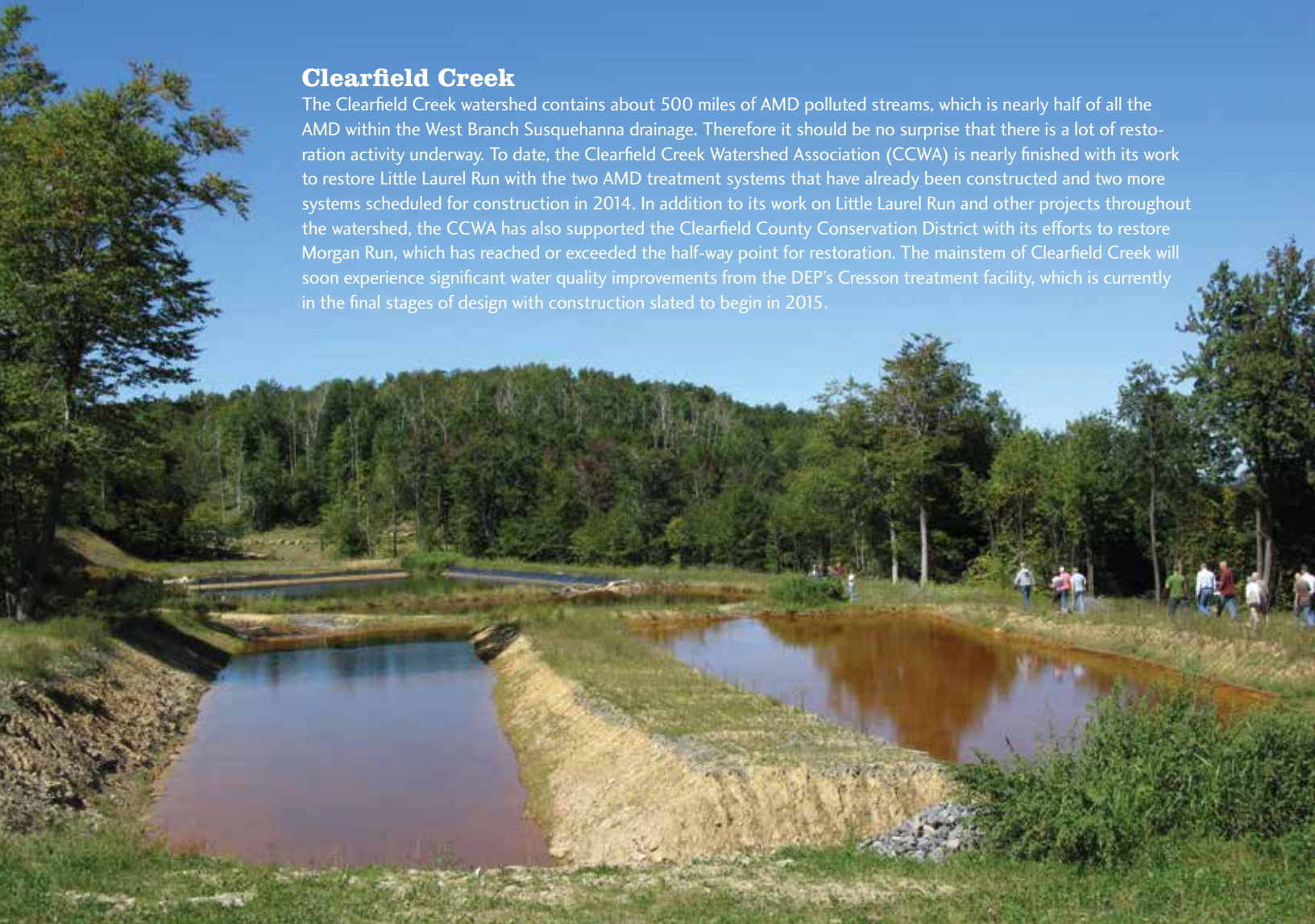


As a result of the Hollywood AMD treatment plant in Hollywood, Clearfield County, water quality on the Bennett Branch Sinnemahoning Creek now supports a stocked trout fishery.

A. WOLFE

Clearfield Creek

The Clearfield Creek watershed contains about 500 miles of AMD polluted streams, which is nearly half of all the AMD within the West Branch Susquehanna drainage. Therefore it should be no surprise that there is a lot of restoration activity underway. To date, the Clearfield Creek Watershed Association (CCWA) is nearly finished with its work to restore Little Laurel Run with the two AMD treatment systems that have already been constructed and two more systems scheduled for construction in 2014. In addition to its work on Little Laurel Run and other projects throughout the watershed, the CCWA has also supported the Clearfield County Conservation District with its efforts to restore Morgan Run, which has reached or exceeded the half-way point for restoration. The mainstem of Clearfield Creek will soon experience significant water quality improvements from the DEP's Cresson treatment facility, which is currently in the final stages of design with construction slated to begin in 2015.



A. WOLFE



Passive treatment systems treat severe AMD pollution in the lower Kettle Creek watershed, allowing the recovery of native brook trout.

Kettle Creek

The majority of the Kettle Creek watershed contains some of Pennsylvania's best trout streams and is designated as "exceptional value" in water quality; however, the very lower section of the watershed before Kettle Creek flows into the West Branch Susquehanna River is polluted with severe AMD. Twomile Run, the main contributor of AMD to Kettle Creek, contains a Class A brook trout fishery in its headwaters and healthy brook trout populations can be found in its other tributaries above the AMD as well. Trout Unlimited, in partnership with the Kettle Creek Watershed Association, state and federal agencies, and other partners, has completed land reclamation and nine AMD treatment projects. Brook trout are now thriving in previously dead stream sections. The water quality improvements from these projects, combined with the benefits from additional land reclamation that the DEP recently embarked upon, will ultimately reconnect and restore 11 miles of brook trout streams and help to restore lower Kettle Creek and improve the West Branch Susquehanna River.

Tangascootack Creek

Tangascootack Creek is the most downstream tributary that contributes AMD to the West Branch Susquehanna River and it may well be the next watershed where recovery is celebrated. The Clinton County Conservation District (CCCD) and their many partners have sponsored land reclamation and six AMD treatment projects through efforts that began in the late 1990s. Within the past decade, significant water quality improvements have been observed more than four miles from the headwaters where the treatment systems are located. Sections of stream that the PA Fish and Boat Commission claimed were barren in the 1950s support a limited number of fish and aquatic insect life now. The CCCD and their partners are very excited to begin studying the recent effects of substantial restoration efforts that were just completed in the fall of 2013. Brook trout are present and ready to repopulate the 36.5 square mile watershed where coal had been discovered 188 years ago.

S. KOSEK



Limestone is added to a vertical flow pond during construction of a passive treatment system to treat AMD in the South Fork Tangascootack Creek.



Different age classes of yellow lampmussel were collected at all sites sampled along the West Branch Susquehanna River.

Mussels — Another Sign of Recovery on the River

The DEP has been conducting large river aquatic surveys across the Commonwealth since 2010. In 2012, the DEP added freshwater mussels to the study parameters and sampled for mussels on the West Branch Susquehanna River in 2012 and 2013. Sample sites were located along the river at Jersey Shore, Loyalsock, Lewisburg, and Milton. The West Branch has a long history of being polluted by man-made impacts such as AMD, dams, sedimentation, and sewage. The DEP collected numerous mussels in a range of sizes, which is an indicator of different year classes, including a few juveniles. The presence of juveniles indicates a thriving mussel population, which is a sign of a healthy, well-functioning aquatic community in the river — and a good sign of recovery working its way upstream on the West Branch Susquehanna River as water quality continues to improve.

Looking Ahead

One glance through this report, a paddling trip on the river, or a successful cast into a once dead stream will easily demonstrate that the West Branch Susquehanna River watershed is not the same place it was a decade ago. A great movement of volunteers and professionals alike has been underway to change the legacy of pollution from abandoned coal mines that devastated so much of this region. The remarkable improvements in water quality and recovery of fish and other aquatic life that has been accomplished thus far are simply undeniable and should be celebrated for every inch of stream restored and every fish hooked.

Although the entire length of the river is well on its way toward recovery and many more restoration projects are underway than what could be highlighted in this report, the work is not yet finished. While the success stories grab the headlines, and deservedly so, there are still numerous polluted streams devoid of aquatic life where restoration work has yet to begin. Safeguarding and increasing the funding that is available to plan and construct new AMD remediation projects, as well as to monitor and maintain the existing treatment systems, is absolutely vital to ensuring that improvements made so far are sustained and that recovery throughout the watershed continues into the future.



Acknowledgments

Special thanks from Amy Wolfe of Trout Unlimited go to the following people for their contributions to this report: Dr. Art Rose, Clearfield Creek Watershed Association; Eric Cavazza, DEP; James Ryan, Babb Creek Watershed Association; John Arway, PA Fish and Boat Commission; Keith Previc, DEP; Pamela Milavec, DEP; Rick Spear, DEP; Scott Koser, Clinton County Conservation District; and Tom Clark, Susquehanna River Basin Commission. Trout Unlimited also wishes to thank the Richard King Mellon Foundation for its generous support of the West Branch Susquehanna Restoration Initiative over the years. Last, but certainly not least, TU salutes and thanks all the members of the West Branch Susquehanna River Task Force and West Branch Susquehanna Restoration Coalition for their hard work and dedication to making the West Branch Susquehanna watershed a better place to live, work, and recreate for this generation and generations to come.

The mission of Trout Unlimited is to conserve, protect, and restore North America's coldwater fisheries and their watersheds.

For more information on the West Branch Susquehanna Restoration Initiative, contact:

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www.tu.org

Information can also be found at the West Branch Susquehanna Restoration Coalition website:

www.wbsrc.org

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