

Tennessee 2014 SWPBA Update

A. Success Stories

1. Little Pigeon River Contact Advisory Lifted

In 1993, elevated fecal coliform levels were found in Little Pigeon Creek and several of its tributaries in and around the Great Smoky Mountain National Park and surrounding cities. The pathogen levels were high enough to post a water contact advisory. It was discovered the high levels of bacteria originated from overflows of municipal wastewater treatment plant, collection systems failures, improperly functioning septic tanks, house hold waste directly discharged to streams, and horse stables in the park.

These issues covered such a large area that it required many stakeholders including the cities of Sevierville, Pigeon Forge and Gatlinburg, TDEC, Sevier County, the Great Smoky Mountain National Park, and Dudley Creek Stable concessionaire, to work together to eliminate the sewage contamination. Sevierville upgraded their Wastewater Treatment Plant and moved the effluent outfall from Little Pigeon River to the much larger French Broad River. Pigeon Forge and Gatlinburg located and eliminated sewer leaks and improper connections. Septic tank and “straight piping” problems were corrected in Sevier County. In the Great Smoky Mountain National Park, Dudley Creek Stables concessionaire installed a new wash rack for the horses and connected to Gatlinburg WWTP. One mile of the riding trail was moved further away from creek.



All of these corrections resulted in so much lower pathogen levels in Little Pigeon Creek, Gnatty Branch, Baskin Creek, King Branch, Roaring Fork and Holy Branch that the water contact advisory was lifted in April of 2014. This is a great boost for the local economy and recreational activities such as fishing and swimming in this beautiful area.

Picture 1: Key personnel involved in improving water quality in the Little Pigeon

2. Leadville Creek Contact Advisory Lifted

In 1986 it was discovered that Leadville Creek had high levels of pathogens from White Pine Sewage Treatment Plant. Since then White Pine has updated the STP and moved the discharge from Leadville Creek to Douglas Lake. The pathogens levels were much lower after the update, but still elevated due to runoff from the city of White Pine and livestock in the area. A partnership between the Tennessee Department of Agriculture, the Jefferson County Soil Conservation District, the U.S. Department of Agriculture's Natural Resources Conservation Service and the Jefferson County government collaborated to assist landowners to fence cattle out of the creek. As a result of these improvements, pathogen levels were low enough to remove the water contact advisory.

3. Tributaries to Trail Fork Big Creek Contact Advisory Lifted

An outbreak of hepatitis A occurred in Del Rio, TN in Cocke County in 1996. Stream sampling in the area revealed elevated pathogen levels, so John Creek and Baker Branch were posted with no water contact advisories. Further investigation revealed that shallow residential wells and streams had been contaminated by failing septic systems. Subsequently the septic systems were repaired. Since then, the pathogen levels in the streams have continued to fall until they were low enough for the contact advisory to be lifted.

4. Little Fiery Gizzard Creek Contact Advisory Lifted

In 1999 it was discovered that Little Fiery Gizzard Creek was contaminated from Tracy City Elementary School's wastewater treatment plant and failing septic systems. The high bacteria levels were of particular concern in Little Fiery Gizzard Creek because of its proximity to the school. At the time, Tracy City had been talking to the city of Monteagle about the possibility of connecting to their wastewater treatment plant. The time table for implementing these improvements was sped up and in 2010, new sewer service was connected to the Elementary School and the homes with failing septic systems. Subsequent monitoring revealed the pathogen levels were low enough to remove the warning. The partnership between Tracy City and Monteagle improved water quality in Little Fiery Gizzard Creek to the point that it was safe to play in again.

5. Crab Orchard Creek Water Quality Improvements

Crab Orchard Creek located in Morgan County has been severely impacted by acid mine drainage from several abandoned coal mines. Almost \$900,000 were spent to help address these problems. Acid water pits were eliminated and passive acid drainage and limestone treatment systems were constructed. Highwalls were filled in, cut and eroded areas were stabilized and the disturbed areas were revegetated. These measures have not only improved water quality in Crab Orchard Creek, but also three tributaries including Mill, Golliher (Picture 2), Fagan and Little Laurel Creeks.



Picture 2: Galliher Creek restoration area

B. Wetlands Update

TDEC applied for an EPA Wetland Program Development Grant in 2013 and was awarded \$651,000 to accomplish five specific goals that focused on strengthening our program within the EPA's Core Element Framework. The first goal, to develop a Wetland Program Plan, is the foundation for wetlands management within the EPA framework. To accomplish this goal TDEC invited stakeholders across the state to participate in a collaborative effort to form specific guidance for state wetland priorities and protection efforts. Staff held multiple working group sessions and are in the final stages of drafting a document. This document will outline TDEC's Wetlands program history and our short and long term goals in four Core Elements: Regulatory Tools, Monitoring and Assessment, Volunteer Restoration and Protection, and Water Quality Standards. TDEC hopes to accomplish these goals by September of 2017.

The second goal, improving monitoring and assessment strategies, is aimed at formalizing a wetlands assessment technique and providing training to TDEC staff. This statewide training has reached the majority of field staff responsible for resource assessment and countless others who had a desire for cross-training. This step is the beginnings of a wetland conditional assessment strategy that is primarily driven by permitting requirements. An additional output from this effort will be a mapping of all identified and assessed wetland resources.

Establishing a consistent approach for applying enforcement, compliance, and compensatory mitigation to ensure no net loss of resources is the third goal. The division is working to carve out inspection priorities of historic mitigation projects to address the state of the resource replacement. These priorities will evolve into inspection forms, protocols, and site visit goals for projects across the state. TDEC is also working to develop a stream functional assessment protocol. This protocol is a companion to our current stream assessment techniques and will allow regulators to more accurately determine impact losses and replacement value of streams.

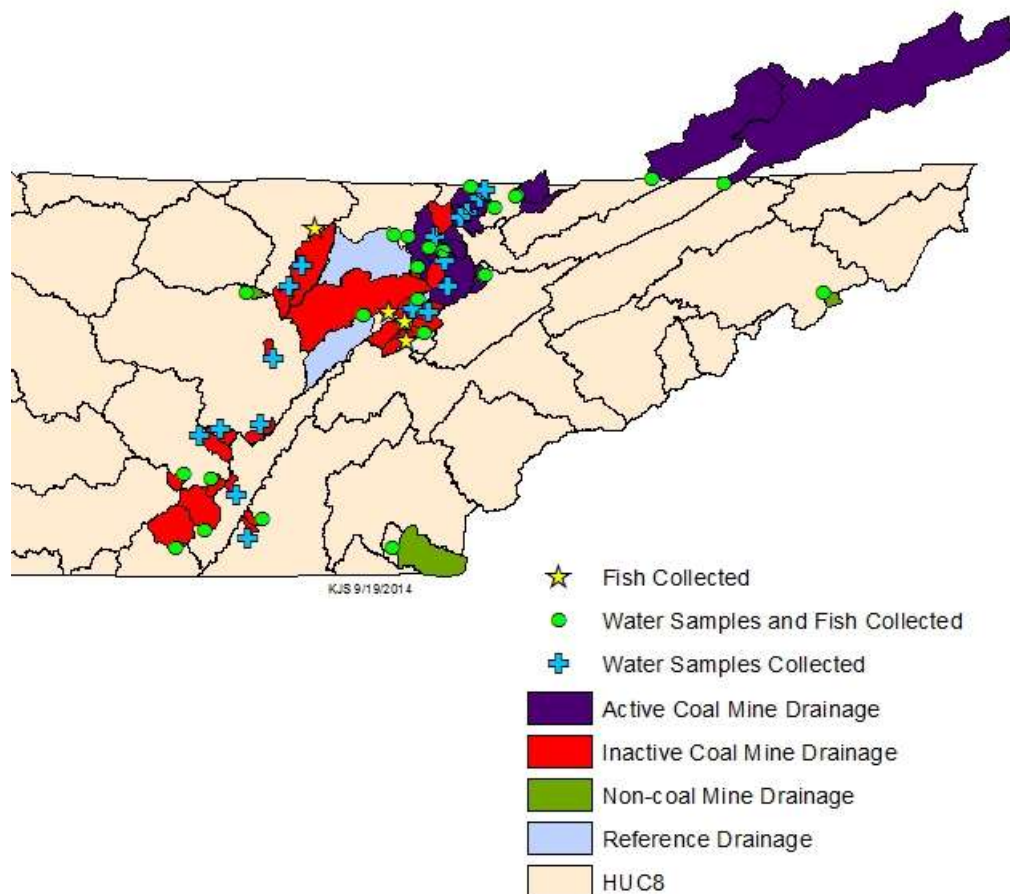
The state of Tennessee is currently pursuing the development of a distinct policy of protection and restoration for wetlands. This process will be a collaboration of relevant state agencies and non-profits that share compatible goals. To develop these state priority areas, the team will consider watershed planning, wildlife habitat, and other objectives when developing the selection process for priority restoration and protection sites. TDEC will create a prioritized list of vulnerable or important wetland areas via data gathered through team collaboration.

Finally, the division plans on enhancing the existing narrative water quality standards for wetlands. Initial steps will be to create a baseline for available, unavailable, and Exceptional Tennessee waters. The department will also adopt an official definition of wetlands. Staff will identify common narrative water quality standards developed by EPA for states that may be applicable and implementable by the state of Tennessee.

C. Coalfields Study Update

Historically coal has been extracted from the Cumberland Plateau and Cumberland Mountain regions of Tennessee. Many of these surface mines were abandoned before the enactment of the Surface Mining Reclamation and Control Act of 1977. Due to present or past mining activities over 1000 miles of 45 streams are included in Tennessee's 303(d) List. Since coal can contain trace metals such as arsenic, mercury and selenium which pose a potential danger to human health and the environment through bioaccumulation in the food chain, it seemed logical to check for fish tissue for the presence of metals.

To fund the study of potential bioaccumulation of metals in native game fish in streams draining active, abandoned and reclaimed coal mines, non-coal mining activities and reference sites, the Division of Water Resources used EPA 106 supplemental funds. Fish tissue and/or water samples were monitored at 43 sites in 2011, 2013 and 2014.



Drainage area upstream of study sites.

Mercury was found in the fish tissue of nine of the sites and was highest in the fish collected at the reference sites. Possibly this can be attributed to mercury air deposition. Although lower than EPA 2013 draft guidelines for selenium, it was highest in fish collected at the active coal mining sites. Arsenic was highest in historic copper mine drainage. Iron, total chromium, copper, and zinc were found in low levels in fish collected from all of the drainage areas. Cadmium, lead, and thallium were not detected in any fish.

Water column samples were collected concurrent with the 2011 fish collection. Few samples exceeded water quality criteria. Those that did were typically on streams already listed as impaired for that parameter from abandoned mines. The complete report will be coming to a computer near you very soon.

D. Southeast Monitoring Network Update

During the SWPBA meeting in November 2011 a reference stream monitoring network was created. Biologists from Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee and TVA agreed to conduct surveys. EPA Region IV agreed to help where needed. Although two main goals of the group are to assess responses to changes in temperature and hydrology and to identify climate-sensitive indicators, it was agreed that a reference network with consistent sampling methodology would be useful for establishing regional reference conditions and provide consistency in assessments of shared watersheds and ecoregions. Data could also be helpful in assessing the effects on aquatic populations of regional stressors including drought, air-deposition and invasive species.

The workgroup agreed on methodologies for continuous water depth and temperature monitoring and annual collection of macroinvertebrates, fish, diatoms, water quality and habitat. Thirty-nine sites were targeted. Stations are in moderate to high gradient streams ranging from 1 to 56 square mile drainage. The majority are in protected watersheds with a minimum of 90% forest. Others are in relatively undisturbed watersheds where land-use is not expected to change significantly in the next 20 years. Monitoring began at most sites in April 2013 with all but two of the remainder starting in April 2014.

Fifteen of the selected sites are located in Tennessee's Level III Ecoregions 66, 67, 68 and 69 (Figure 1). Together TDEC and TVA have collected all of the selected parameters collected for two and half years. TDEC and TVA will give reports of on the results of the macroinvertebrate and fish data at the 2014 SWPBA meeting (inverts contingent on TDEC actually finding time to compile the data by then!)

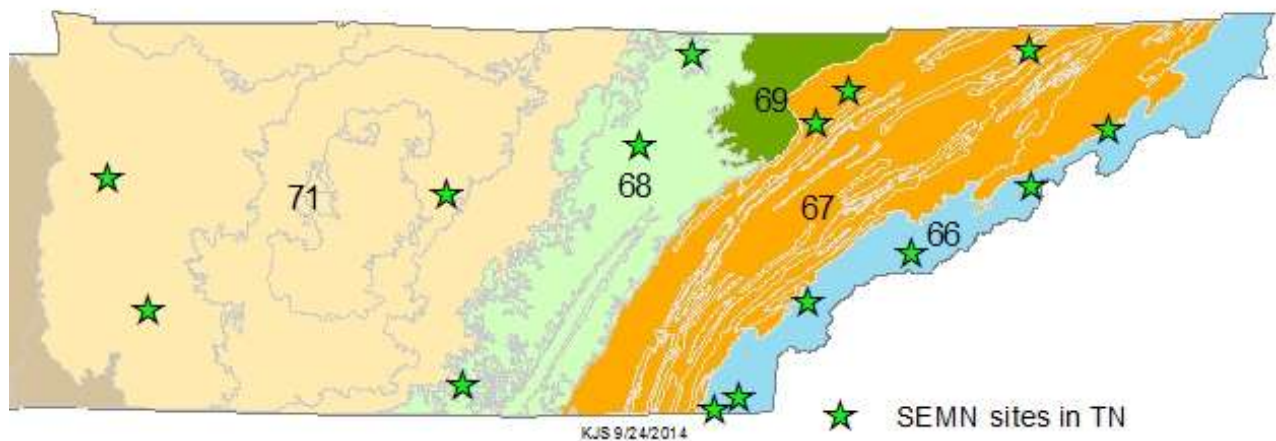


Figure 1: SEMN monitoring sites located in Tennessee

E. TDEC on Line

TDEC has developed interactive maps and databases supplying a large amount of information to the public in an easy to access forum.

- This interactive map illustrates water quality, monitoring sites, high quality streams as well as Hydrologic Unit Codes and Ecoregions boundaries at the following weblink <http://tnmap.tn.gov/wpc/>.
- Another map shows various permits issued throughout the state including aquatic resource alteration permits (ARAP), construction permits, national permit discharge elimination permits (NPDES), underground storage tanks, septic system, and biosolid permits at <http://tdeconline.tn.gov/tdecwaterpermits/> .
- The department also offers the public access to specific information in a searchable database format on permits, exceptional Tennessee Waters, complaints, appeals, inspections and oil and gas at the following weblink: http://environment-online.state.tn.us:8080/pls/enf_reports/f?p=9034:34001:8357139784376 .
- A link to all current Division of Water Resources published reports may be found at http://tn.gov/environment/water/water-quality_publications.shtml .