2009 NPS Report - Raccoon Creek Watershed

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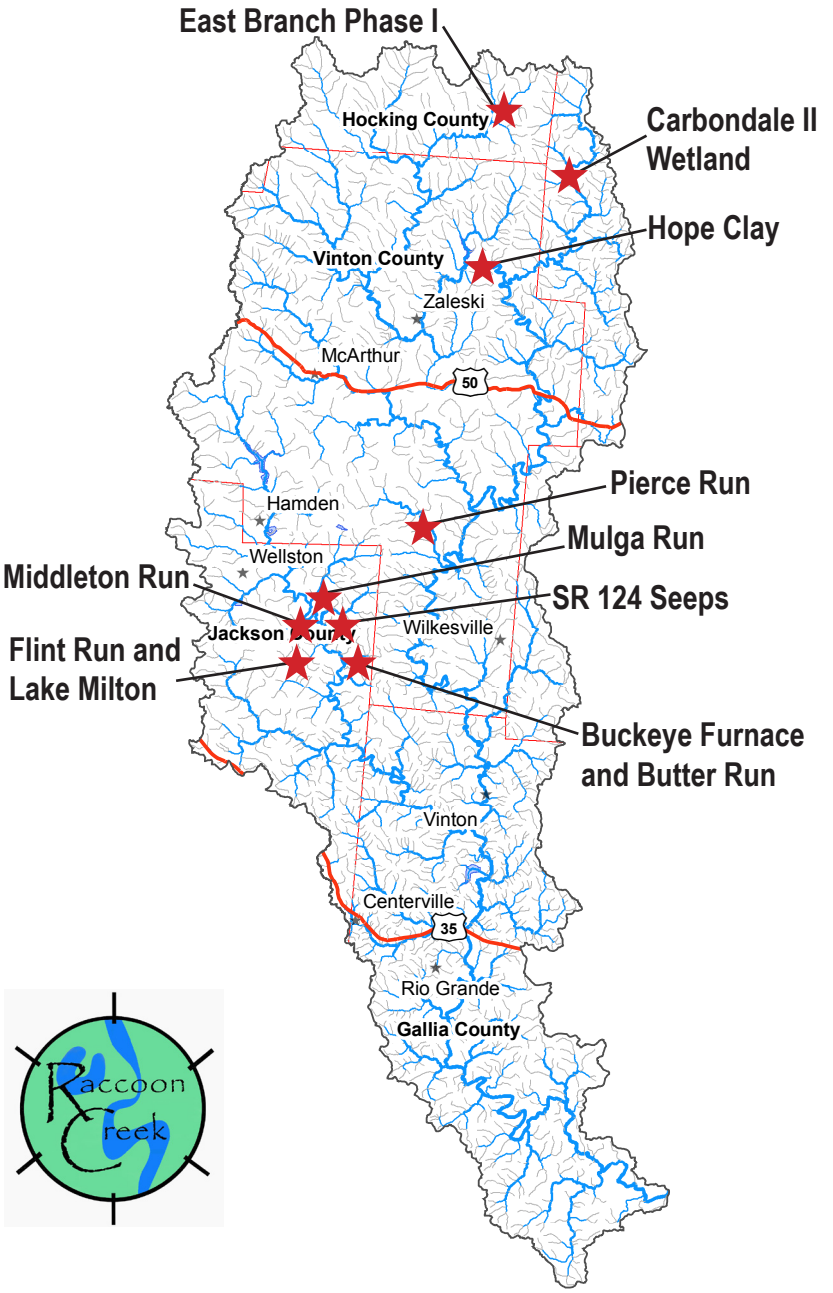
The Raccoon Creek Watershed Project is a local partnership working towards conservation, stewardship, and restoration of the watershed for a healthier stream and community. The partnership consists of multiple agencies and individuals working to restore and promote the waters of Raccoon Creek. Encompassing over 683 square miles, the watershed lies in portions of six southeast Ohio Counties (Athens, Hocking, Meigs, Vinton, Jackson and Gallia). Raccoon Creek is one of Ohio's longest streams, measuring 112 miles draining into the Ohio River in Gallia County. Major sources of impairment to the stream include acid mine drainage (AMD), drainage from wastewater treatment facilities, and industrial discharges. By and large, AMD contributes to the vast majority of pollution issues in the watershed.

The watershed currently has over 25,610 acres of underground coal mines and 21,550 acres of surface coal mines within its boundaries. About 110 acres of abandoned coal refuse piles also lie in the watershed. These abandoned mines and refuse piles leach thousands of pounds of sulfuric acid and metals into the creek daily, significantly degrading the water quality of streams. In the late 1990's representatives from several partnering agencies, including the Institute for Local Government and Rural Development (ILGARD), Ohio Department of Natural Resources, Division of Mineral Resource Management, and Ohio EPA, prioritized sites that contributed the most AMD pollution to Raccoon Creek and began to implement restoration strategies on these sites. Because the watershed is so large, three major sub-shed divisions are used to break up the region into more manageable sections. These consist of the Headwaters, Little Raccoon, and the Middle Basin sub-sheds. Each of these sections has priority AMD projects. Some of these projects have been completed, some are in progress, and some are anticipated future projects.

Headwaters

The major priority sites in the headwaters sub-shed include East Branch, where several impacted tributaries contribute to significant acid and metal loadings in Raccoon Creek. Brushy Creek and the Mainstem of Raccoon Creek above Brushy Creek are also priority AMD abatement sites.



Raccoon Creek near Moonville, Photo by Ben McCament

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Little Raccoon

Flint Run is the largest contributor of AMD in the Little Raccoon Creek watershed. A majority of this (90%) is attributed to a 240-acre site in the headwaters. This site, called Broken Aro, previously housed a coal preparation facility and mine tailings dump. Other major AMD contributors in this basin include Mulga Run, Buffer Run and Goose Run.

Middle Basin

Major acid contributors in the middle basin include Rock Camp and Pierce Run. Rock Camp is the most consistent contributor of AMD, and has net acidic water regardless of flow. Pierce Run has experienced some net alkaline flows; it is thought that this might result from current mining operations in the area.

Watershed Outreach

In addition to the technical work of AMD remediation, other activities in the watershed are geared toward meeting goals of stewardship and conservation in the region are coordinated by the Raccoon Creek Partnership. Annual litter pick-ups, tree-plantings and canoe-floats all encourage residents to become stewards of our watershed. The Waterloo Aquatic Education Center is used for school programs for youths to help educate students about water quality, acid mine drainage, and the value of clean water. In addition, a community group has formed to address access issues for canoers and kayakers who wish to paddle on the creek, the Raccoon Creek Water Trail Association.

For further updates on the progress in Raccoon Creek, please visit our webpage at:
www.raccooncreek.org

Attainment Miles

Total stream miles assessed impacted by mine drainage = 190 miles

Target #1 indicates 30% attainment of impaired streams by 2010 = 57 miles

2006 progress = 23.3 miles meeting Full WWH attainment

(48 miles assessed in 2006)

Completion

Sub-target 2

Total projects proposed in three Raccoon Creek Watershed AMDATS = 25

Total projects complete = 10

Reductions

Total acid load reduction = 5,570 lbs/day
Total metal load reduction = 1,022 lbs/day

Data derived using the Mean Annual Load Method (Stoertz, 2004).

Design = $1,647,388
Construction = $6,842,225

Total Costs through 2009 = $8,489,613

Timeline of the Raccoon Creek Watershed
Project Milestones & AMD Projects

This timeline shows the history of the Raccoon Creek Watershed Partnership, started almost two Decades ago by a group of concerned local citizens. Today, the partnership consists of multiple state and local agencies and private citizens. AMD projects have been administered through the Vinton Soil and Water Conservation District and Ohio University's Voinovich School (ILGARD), with funding from various state and federal grants but mostly from Ohio EPA's 319 program and ODNR-MRM's AMD program.

1980s Formation of Raccoon Creek Improvement Commitee (RCIC): Grassroots citizens group to address water quality issues in Raccon Creek

Early 1990s
RCIC invites citizens from all six counties to join efforts

Late 1990s
Formation of Raccoon Creek Watershed Partnership,a loosely based partnership of agencies to address technical AMD issues

1999 State Route 124 Strip Pit and Buckeye Furnace Project completed

2000 Little Raccoon Creek AMDAT completed
Watershed Coordinator position funded for six years

2001 Headwaters AMDAT completed
State Route 124 seeps project completed

2003 Mulga Run project completed
Middle Basin AMDAT completed
Completed management plan for Raccoon Creek Watershed

2004 Carbondale II project completed

2005 Middleton Run-Salem Road project completed

2006 Raccoon Creek Water Trail Association formed
Mission to Establish a water trail on Raccoon Creek

Flint Run and Lake Milton Projects completed
Watershed Coordinator three year extension funded

2007 Raccoon Creek Watershed Partnership formed 501 (c) 3
Waterloo Aquatic Education Center opened

2008 East Branch Phase I AMD Project

2009 Pierce Run AMD Project began
East Branch Phase II Project began

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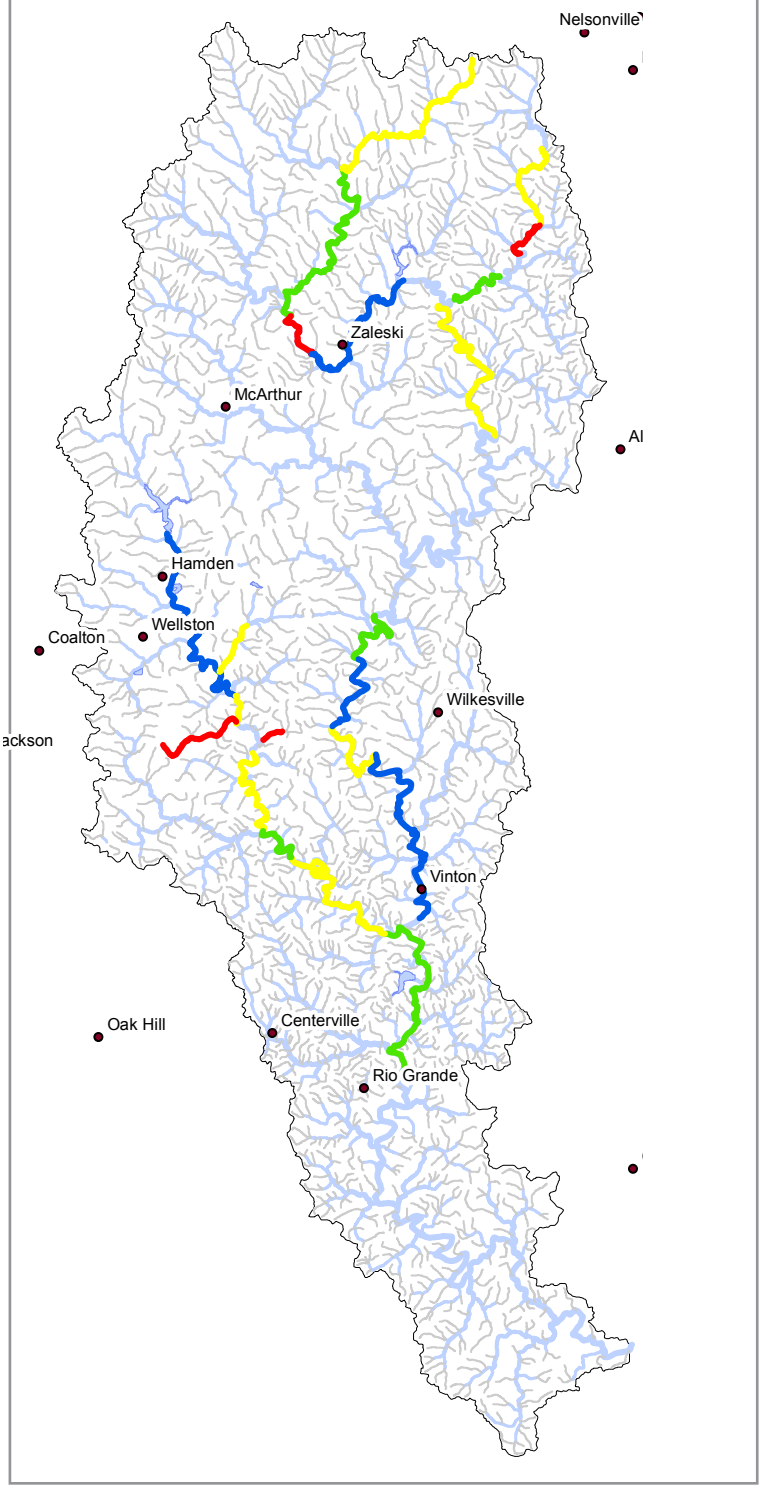
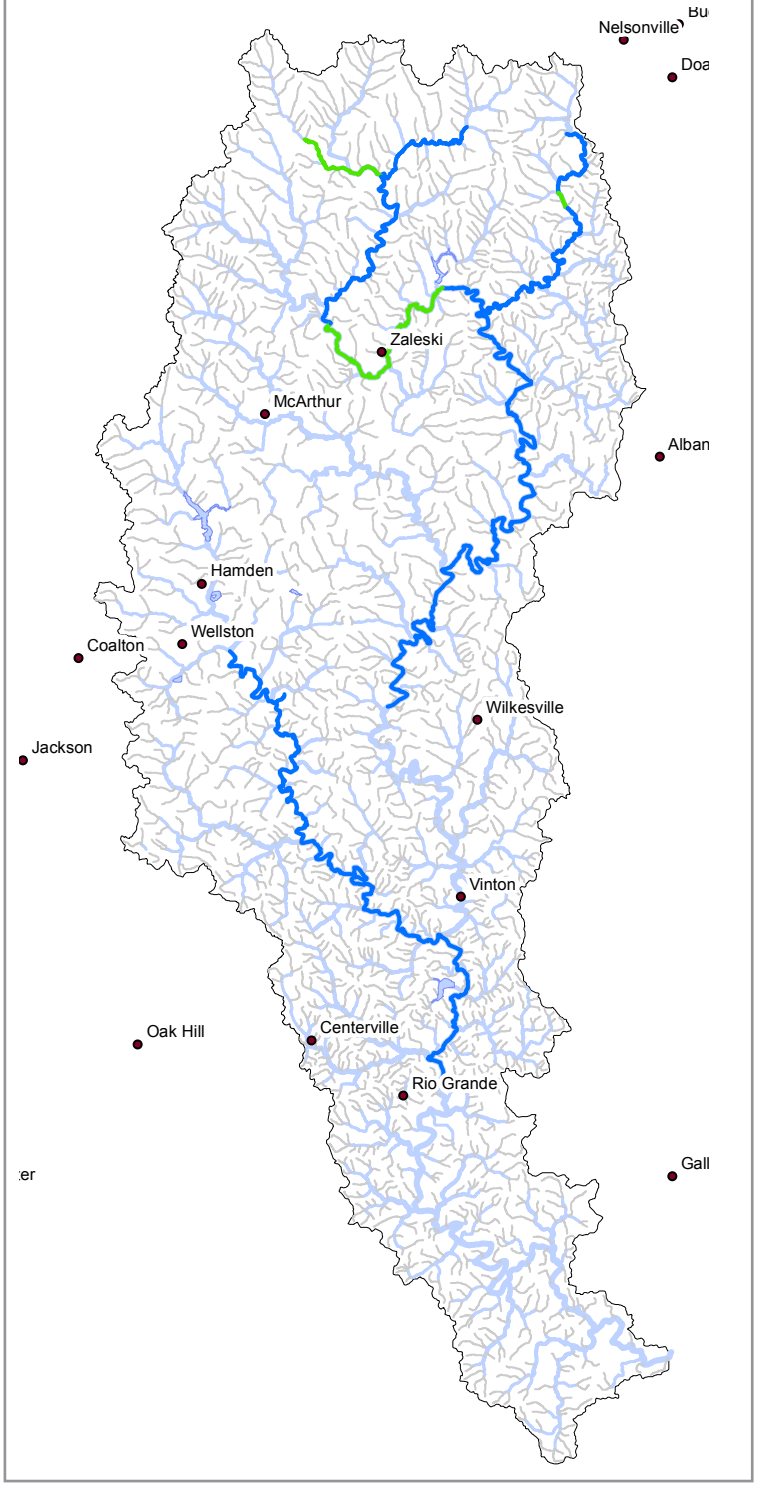
Chemical Water Quality

Raccoon Creek baseline pH



Raccoon Creek 2009 pH



In Raccoon Creek pH values have improved throughout the watershed from baseline conditions (1994-2001) to 2009. Raccoon Creek mainstem, Hewett Fork and Little Raccoon Creek average pH values have increased from a range of 4.0-5.4 during baseline to 6.1-8.8 in 2009. (In 2009, 14.4 river miles in Hewett Fork, 27 river miles in Little Raccoon Creek, and 57 miles along the mainstem of Raccoon Creek all met the pH standard (pH >6.5)).

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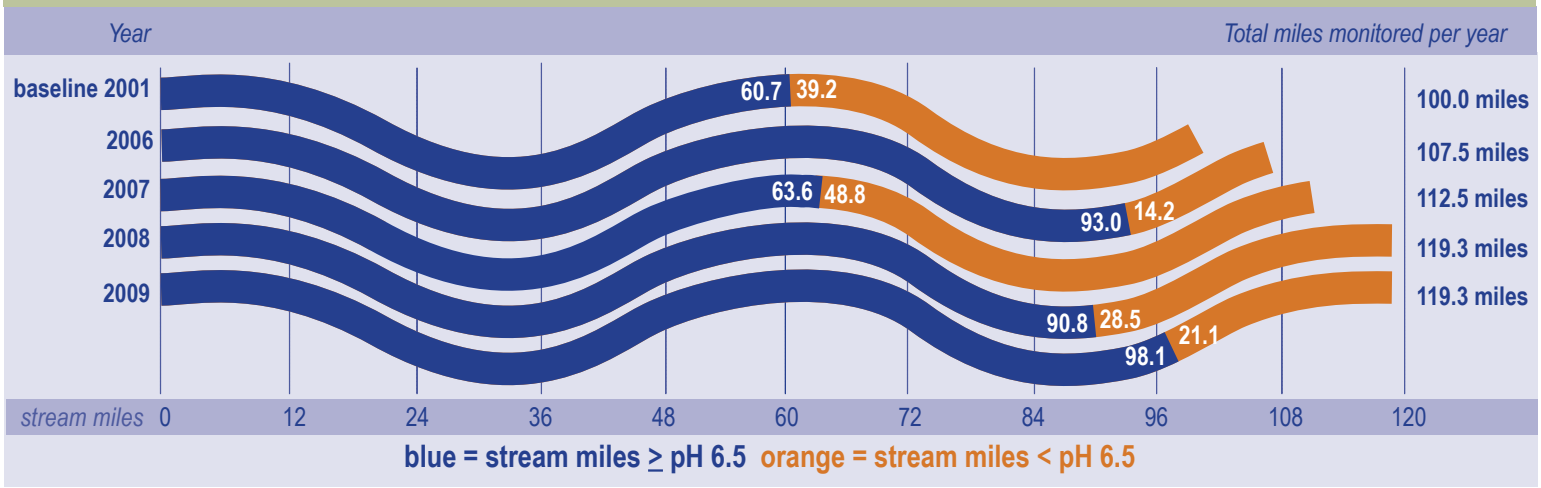
Chemical Water Quality

There are approximately 119 stream miles monitored each year along the mainstem of Raccoon Creek (downstream to Rio Grande), Little Raccoon Creek, Hewett Fork, and East and West Branch. A pH target has been set to 6.5. Each year there is an increase in the number of miles that meet this target. In 2007 nearly 64 miles of the 113 monitored met this target. In 2008, there was a large increase (30%) with near 91 stream miles meeting the pH target of 6.5 of the 119 miles monitored. In 2009, 98 of the 119 miles monitored met the target, a 7% increase (Figure A).

Figure A. Raccoon Creek otal stream miles monitored for pH through time



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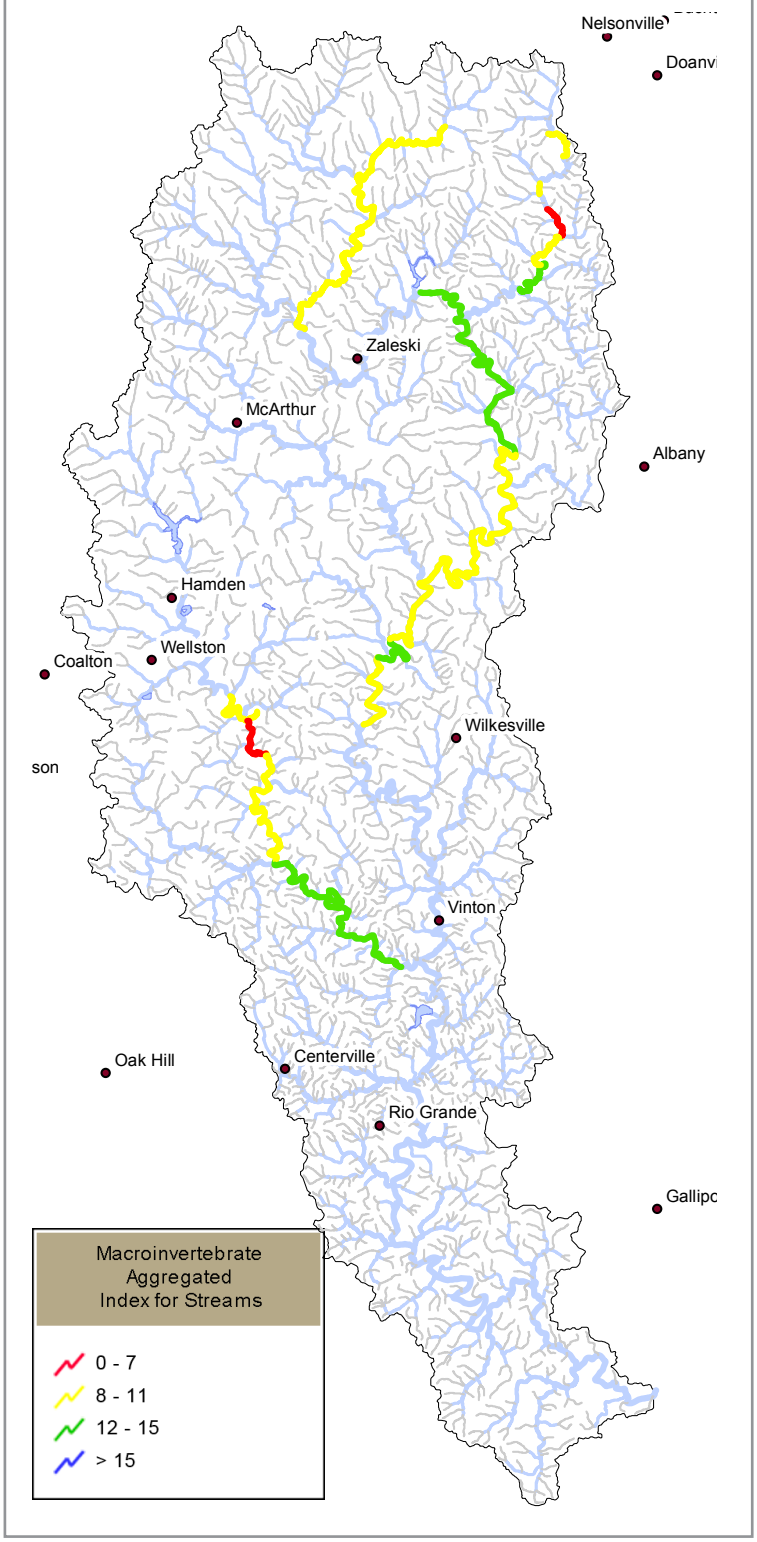
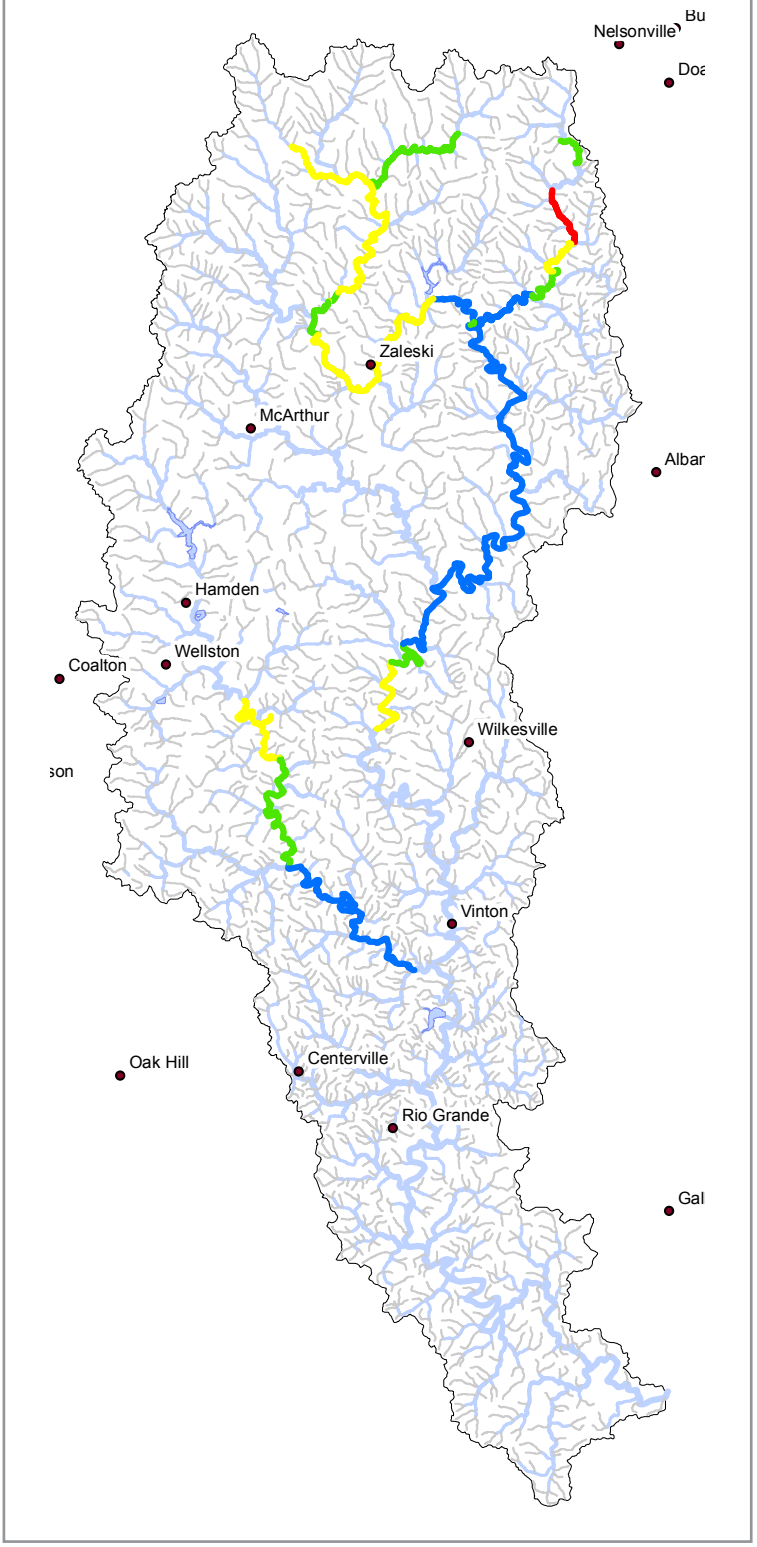
Biological Water Quality

Raccoon Creek baseline MAIS



Raccoon Creek 2009 MAIS



MAIS samples were collected throughout Raccoon Creek in 2009, these stations has been established as annual monitoring stations for macroinvertebrates. These sites are used to track incremental changes each year, figures 1 and 2.

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Biological Water Quality

MAIS samples were collected throughout Raccoon Creek from 2006 through 2009. These stations have been established as annual monitoring stations for macroinvertebrates they will be used to track incremental changes in future years. After each station amasses five samples (five years of data) a regression analysis can be used to determine changes.

Figure B. Area of degradation for MAIS scores in Hewett Fork from 2008 to 2009.

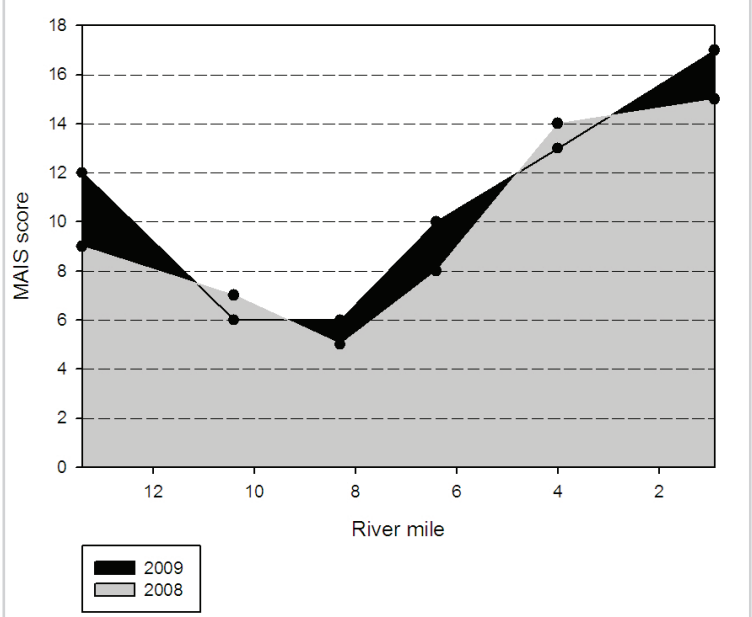
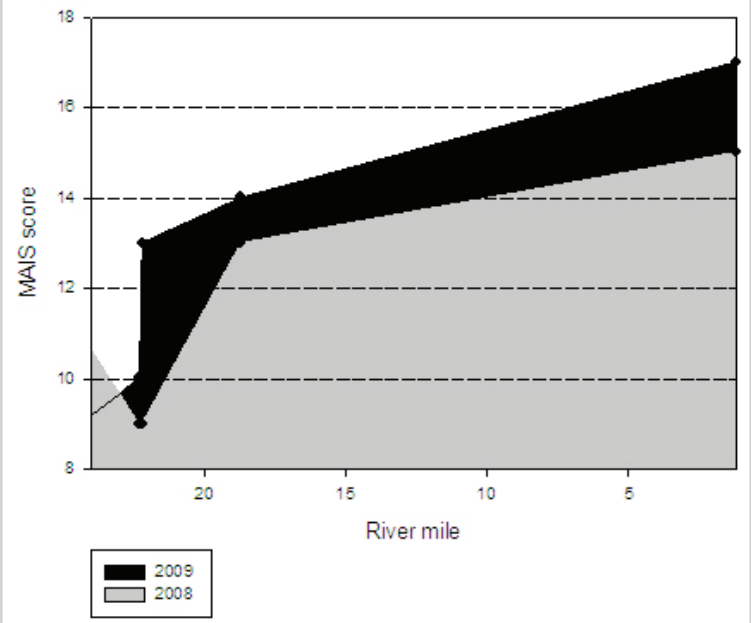


Figure C. Area of degradation for MAIS scores in Little Raccoon Creek from 2008 to 2009.



Area of Degredation Hewett Fork

RM	2006	2007	2008	2009
13.4				
10.4	-12	-39	-24	-18
8.3	-16.8	-37.8	-25.2	-25.2
6.4	-15.2	-22.8	-20.9	-15.2
4	-4.8	-4.8	-4.8	-2.4
0.9	3.1	3.1	15.5	18.6
Total area of degradation	-45.7	-101.3	-59.4	-42.2
		Improved relative to 3 prior years		

The 2009 measures of biological quality (macroinvertebrate scores) showed an overall reduction in the area of degradation, with the greatest improvements being seen in the mid-lower parts of the mainstem (from Kings Hollow Rd, RM 6.4 downstream). The sampling station at the mouth of Hewett Fork at Moonville achieved a MAIS score of 17 and rating of Very Good quality.

Area of Degredation Little Raccoon Creek

RM	2006	2007	2008	2009
24.4				
22.3	-8.4	-6.3	-8.4	-10.5
18.7	-18	-7.2	-21.6	-3.6
12.7	-24	6.0	-12.0	18.0
1.2	11.5	23.0	46.0	80.5
Total area of degradation	-38.9	15.5	4.0	84.4
		Improved relative to 3 prior years		

Little Raccoon Creek showed a solid trend of improved biological quality in 2009, compared to the three preceding years.