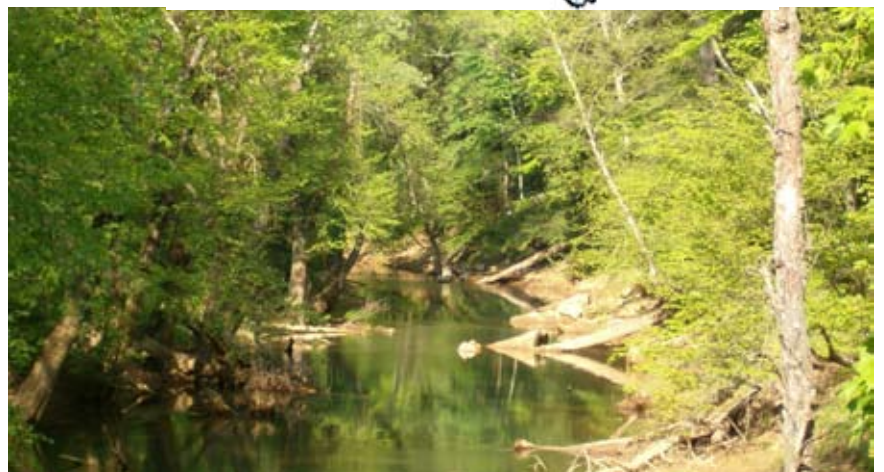
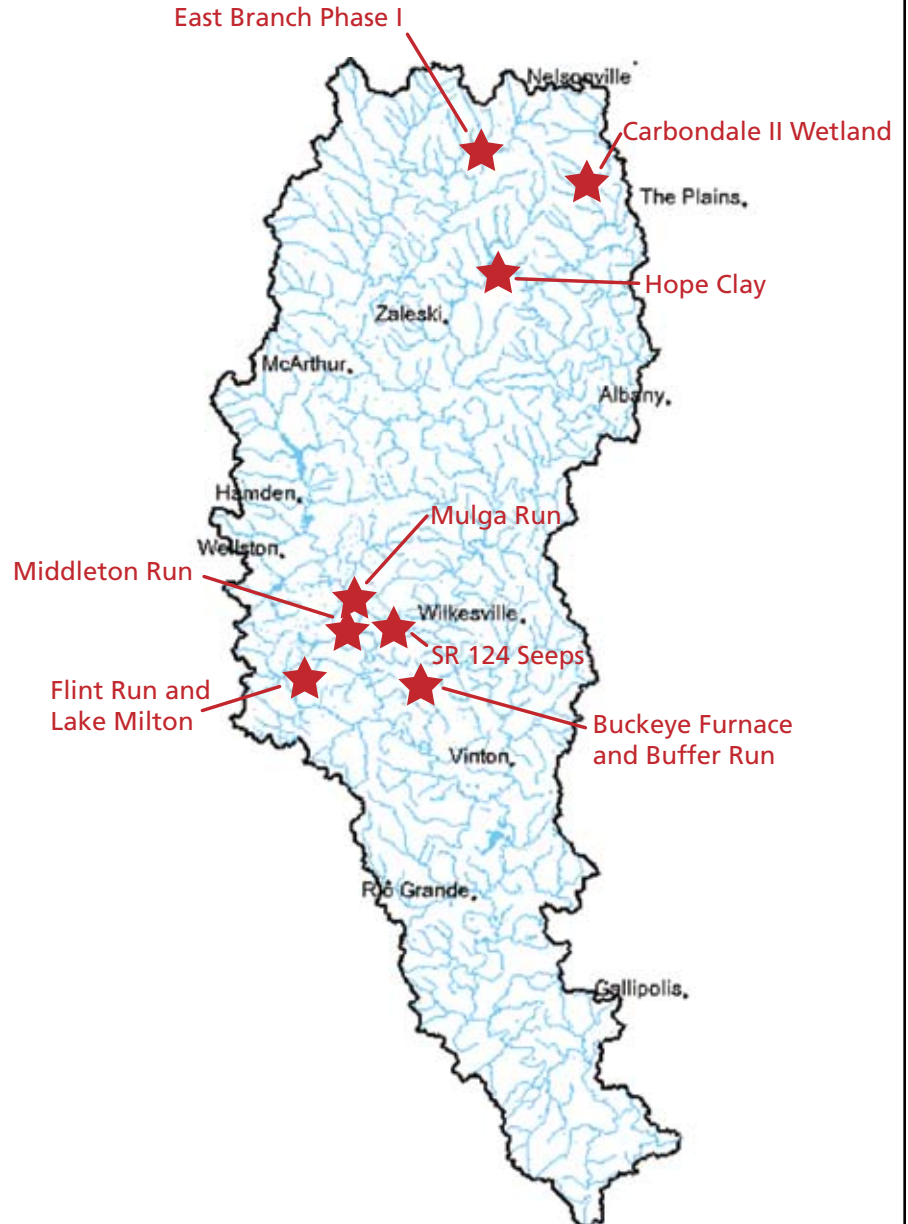


- The Raccoon Creek Watershed Project is a local partnership working towards conservation, stewardship, and restoration of the watershed for a healthier stream and community. The partnership consists of multiple agencies and individuals working to restore and promote the waters of Raccoon Creek. Encompassing 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



Raccoon Creek near Moonville, Photo by Ben McCament

Creek above Brushy Creek are also priority AMD abatement sites.

- 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. Annual litter pick-ups, tree-plantings and canoe-floats all encourage residents to become stewards of our watershed. School programs for youths help educate students about water quality, acid mine drainage, and the value of clean water. In addition, a new community group has formed to address access issues for canoers and kayakers who wish to paddle on the creek.

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



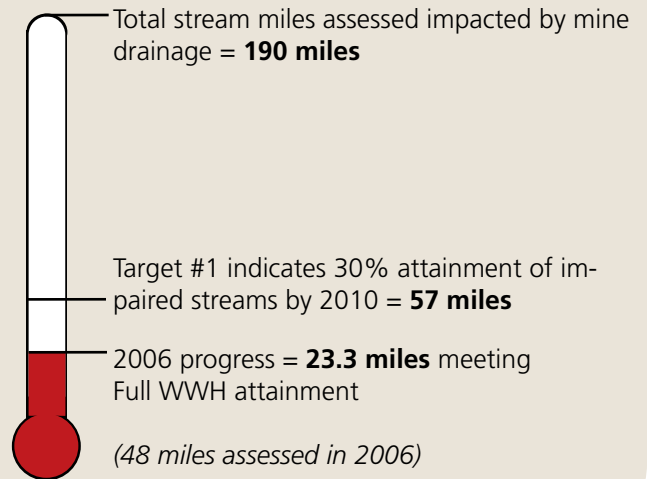
Reductions

Total acid load reduction = 4,706 lbs/day

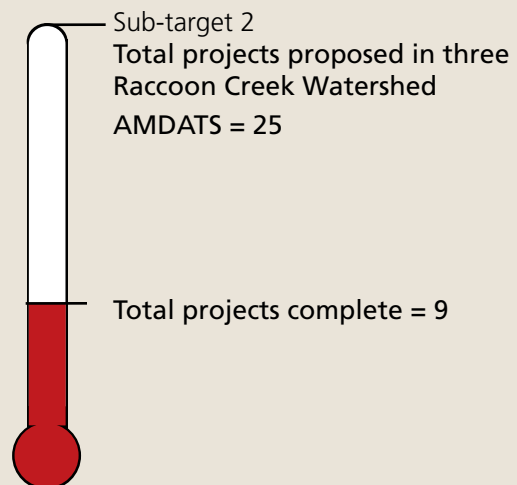
Total metal load reduction = 849 lbs/day

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

Attainment Miles



Completion and Costs



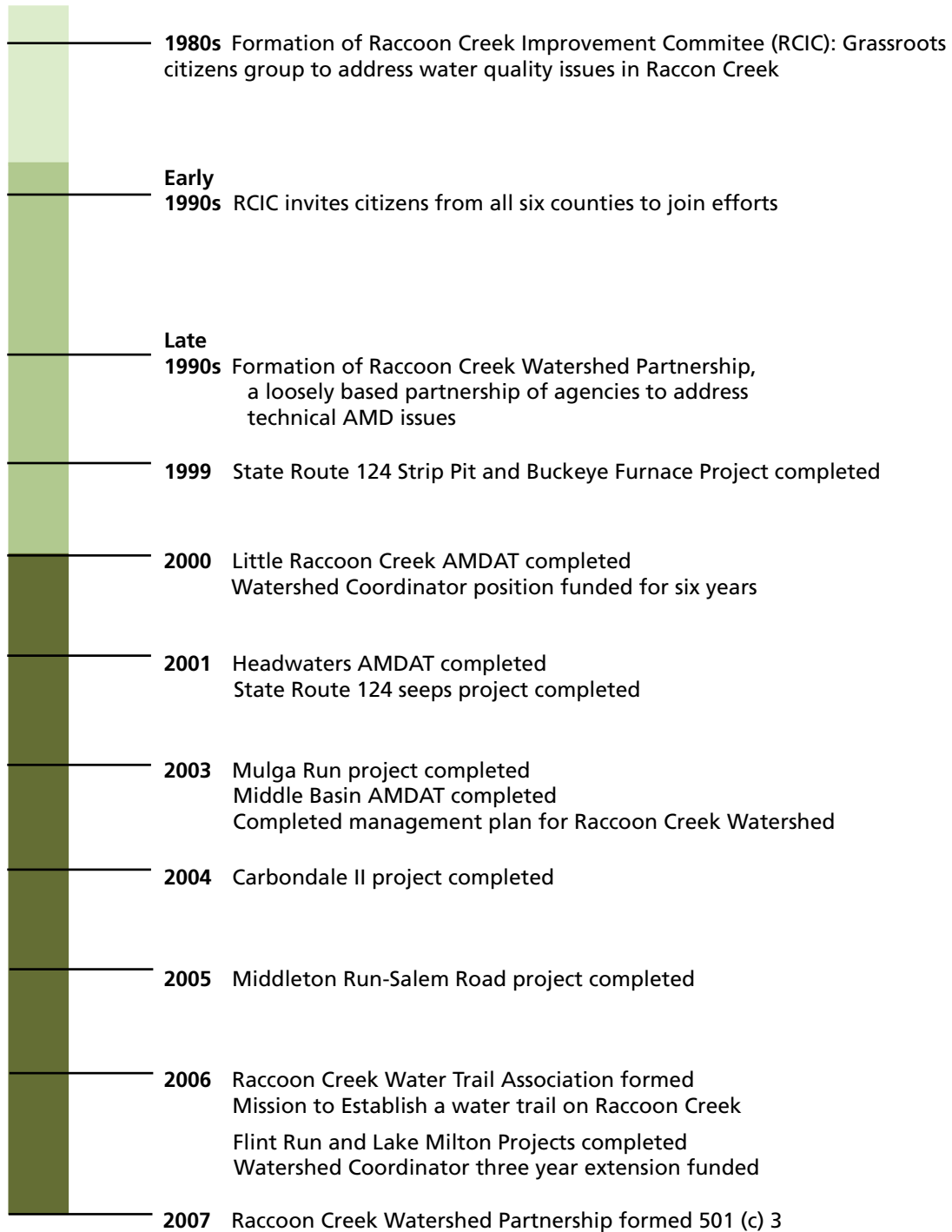
Design = \$1,421,573
Construction = \$6,253,282

Total Costs through 2007 = \$7,674,855

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.



Projects Completed Jan. 1, 2007 – Dec. 31, 2007

East Branch Phase I \$ 976,725

Load Reductions will be evaluated in 2008 for this project

East Branch Phase I

Acid Load NA lbs/day

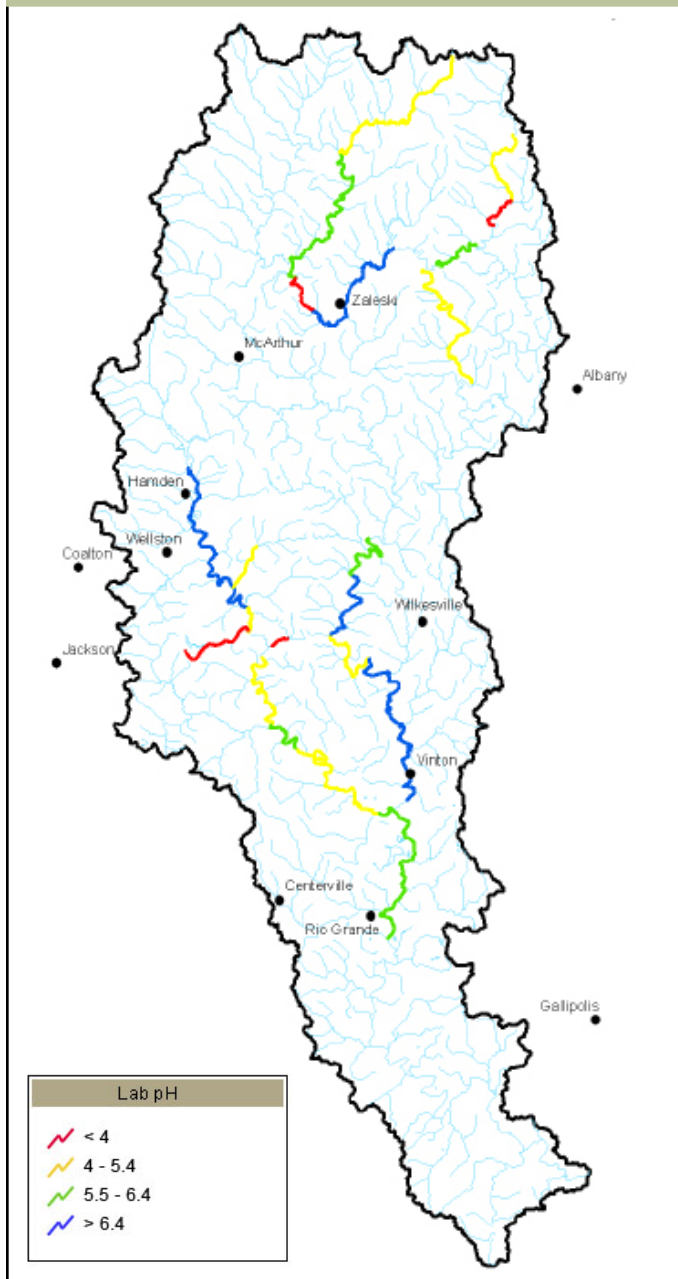
Metal Load NA lbs/day

Cumulative BMP's installed

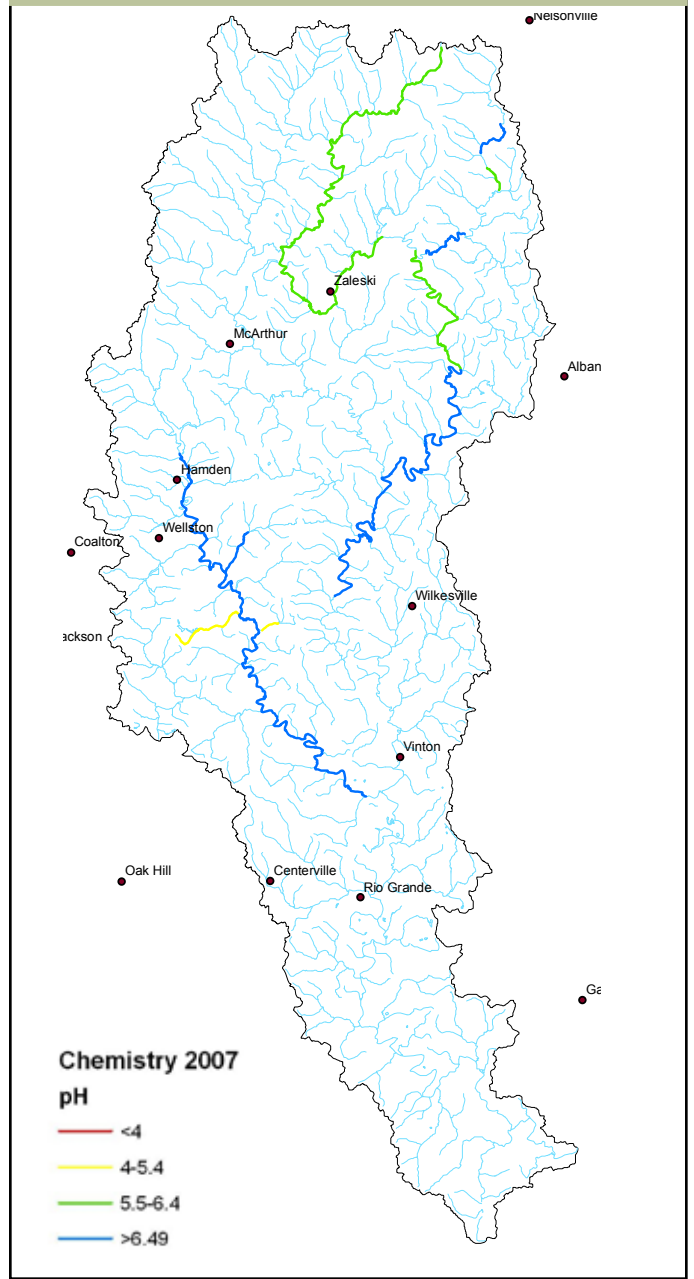
Treatment Installed	East Branch Phase I
Open Limestone Channel	1,100 <i>linear feet</i>
Steel Slag Leach Bed	16,251 <i>square feet</i>
Settling pond with limestone berms	42,000 <i>square feet</i>
Reclaim gob pile	4.8 <i>acres</i>
Limestone J-trench	12 <i>linear feet</i>

Chemical Water Quality

Raccoon Creek baseline pH



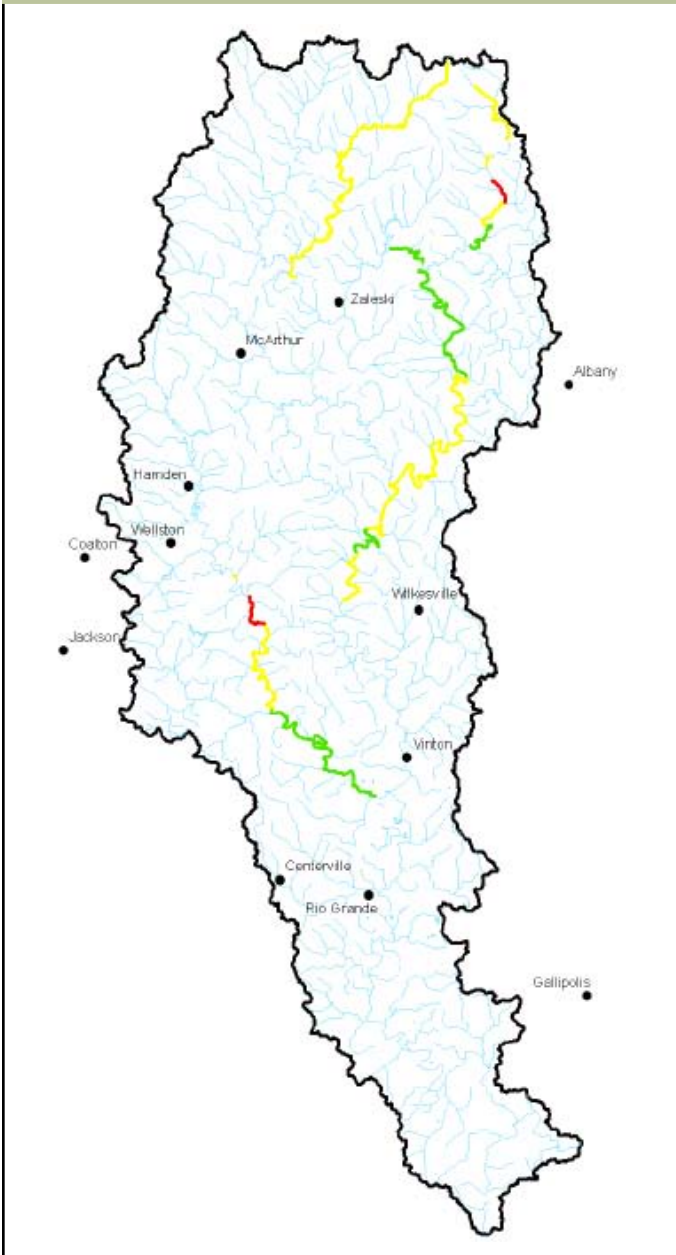
Raccoon Creek 2007 pH



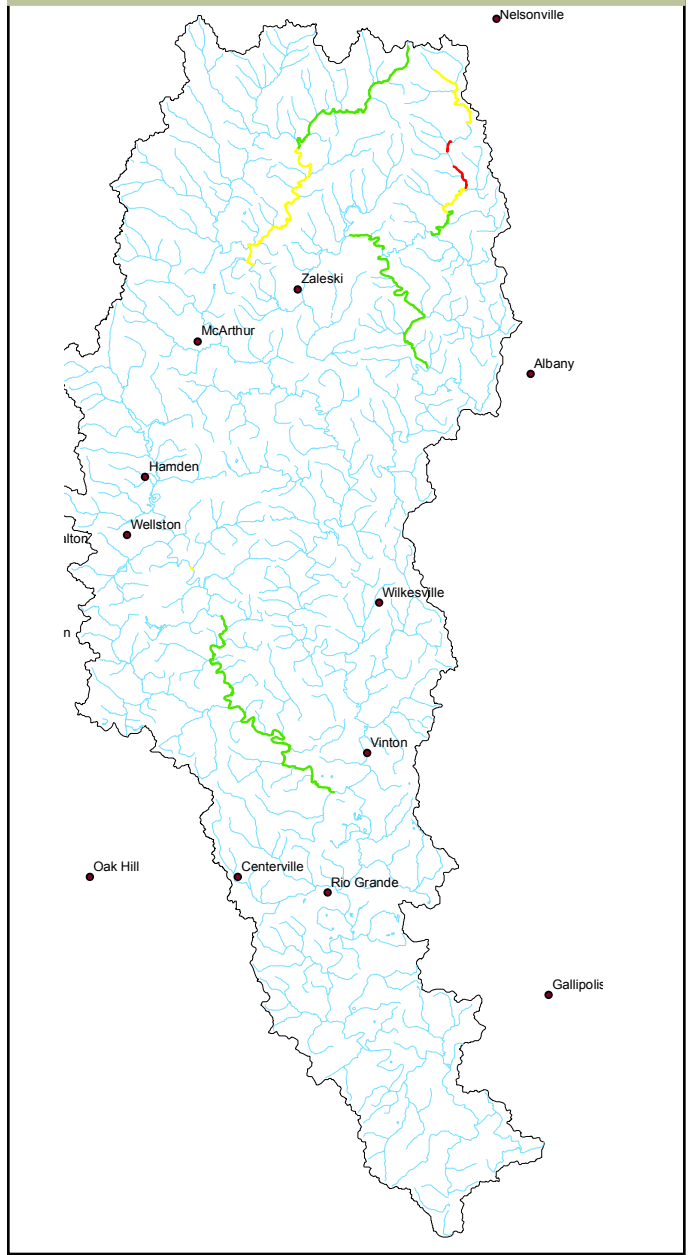
In Raccoon Creek pH values have improved throughout the watershed from baseline conditions (1994-2001) to 2006. Raccoon Creek mainstem, Hewett Fork and Little Raccoon Creek average pH values have increased from a range of 4.0-5.4 to 5.5-6.5. In 2007, 3.6 river miles in Hewett Fork, 24.6 river miles in Little Raccoon Creek, and 10 river miles along the mainstem of Raccoon Creek all met the pH standard (pH > 6.5)

Biological Water Quality

Raccoon Creek 2006 MAIS



Raccoon Creek 2007 MAIS



Macroinvertebrate Aggregated Index for Streams

- ~ 0 - 7
- ~ 8 - 11
- ~ 12 - 15
- ~ > 15

MAIS samples were collected throughout Raccoon Creek in 2007, these stations has been established as annual monitoring stations for macroinvertebrates. These sites will be used to track incremental changes in future years.

MAIS samples were collected throughout Raccoon Creek from 2005 through 2007. 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. One station on Hewett Fork has data from 2001-2008, HF090 (RM 8.3). The regression analysis for this site indicates 'no statistical change' over the seven year period. There was a slight score increase from 2005 to 2006, but fell in 2007 (P value 0.17) (Johnson 2008, personal communication).

After 2009 when there are at least five sampling events to perform the more robust regression analysis, an 'area of degradation' analysis can be used to assess degradation along a section of stream. In Hewett Fork from 2006 to 2007, along river mile 13.4 to 0.9, the area of degradation grew worse (-34 to -62). The first three stations from RM 13.4 to 8.3 all declined, while the last three stations from RM 6.4 to 0.9 remained constant. Along Little Raccoon Creek, river mile 24.4 to 1.2, from 2005 to 2007, MAIS data showed biological improvement both from 2005 to 2006 (-164 to -58) and from 2006 to 2007 (-39 to +16) (Figure 1). The +16 signifies areas (river mile 18.7 to 1.2) that are meeting the biocriterion target of twelve (Kinney, master thesis 2006).

Figure 1. Area of degradation for MAIS scores in Little Raccoon Creek from 2006 to 2007

