

# The Thalweg

## Watershed Stewardship Fair, February 27<sup>th</sup>

*by Vicki Culbreth, Cobb County Watershed Stewardship Program*

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It's almost time for our annual Watershed Stewardship Fair! Last year was a great success. To make this year's fair even better, we encourage all of our new Cobb County monitoring groups to participate.

Cobb's Fair is a data sharing event that showcases volunteer stream projects. Participants are encouraged to share their stream observations and project goals with the community. Each group is invited to create a poster displaying their water quality monitoring efforts.

***The Watershed Stewardship Fair provides volunteers with the opportunity to meet others working to improve ecological conditions in Cobb County. Last year 16 AAS groups participated, with over 50 people in attendance.***

For those who wish to share, we also give each Adopt-A-Stream group a few minutes to relate success stories and share concerns and frustrations with a like-minded audience. This is your opportunity to learn from and support other volunteer monitors.

In addition to a fun evening of education and mingling, we are also offering laboratory tours for those who are interested in the day to day workings of the Cobb County Water Quality Lab. The tour is great for all ages! Last year we had students attending from Blackwell Elementary School, Kennesaw Charter School, and Walton High School.

To provide our volunteers with an opportunity to share their concerns with State and federal regulators as well as advocacy groups, we will again invite representatives from Georgia Environmental Protection Division, EPA, Georgia Conservancy, Georgia River Network, and Upper Chattahoochee Riverkeeper. Georgia Adopt-A-Stream will also be attending and demonstrating the new online volunteer database.

Join us on February 27, 2008 to learn about the new online resource, tour the lab, meet fellow volunteers, and speak to environmental professionals. Drinks and refreshments will be provided. We hope to see you there!

### Special Events of Interest...

- Watershed Stewardship Fair on 2/27
- Rain Barrel Workshops on 4/25
- Three educator workshops are being offered this spring
- Adopt-A-Stream Monitoring Workshops: Chemical on 3/1 Biological on 4/5



## Our Streams: Observations From the Drought

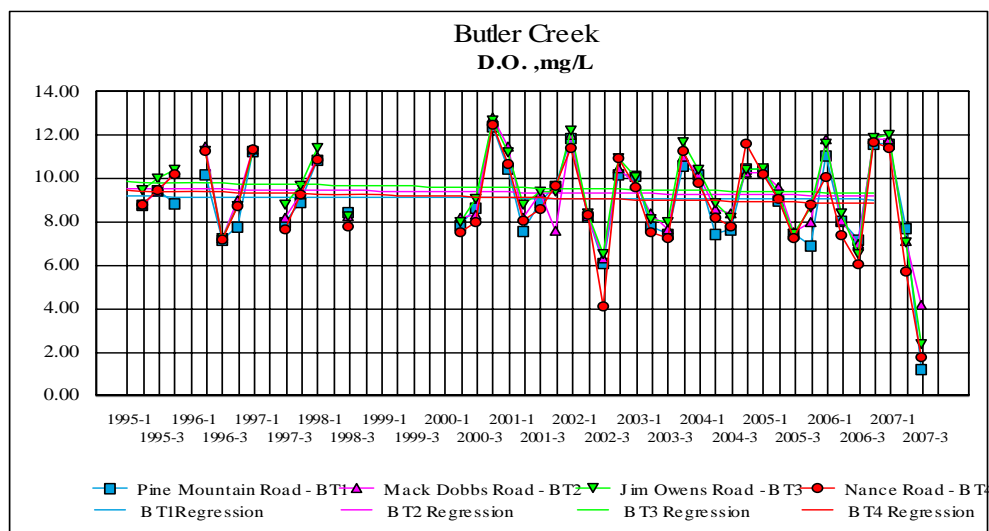
*by Adam Sukenick, Cobb County Watershed Monitoring*

Only 31.85 inches of rain fell on Atlanta in 2007. Although rain hasn't been plentiful, we have been inundated with countless newscasts about the record drought and the shrinking volume of our lakes. With rainfall totals well short of the 50.2 inch annual average, 2007 set a record low level for Lake Lanier and only narrowly escaped being the driest year in history. Area lakes were possibly the top story of 2007 and certainly the most publicized victim of the drought but they were not alone. Streams feeding the local lakes were also severely impacted and, in some cases, went completely dry.

It's too soon to tell what, if any, lasting impacts the drought has caused to local streams but it is certain that changes have occurred. When water flows through a stream channel it creates an environment for aquatic life. It carries oxygen and nutrients to organisms, dilutes pollutants, regulates temperature, moves sediment, contours stream banks and substrates, facilitates chemical interactions and sets the physical and chemical parameters for the aquatic community. If flow of water were to end, life too would end. But if water is reduced to a trickle (as it was in many streams this year) how will the aquatic community respond?

As consumers, we expect to see running water when we turn on the faucet. If we were aquatic organisms we would expect that water, our source of life and our entire environment, would continue to provide the necessary elements of our existence. This year the Cobb County Watershed Monitoring Program visited 91 sites on 21 different streams each quarter to collect water quality samples and record field observations. While not all the data has been analyzed, some changes are apparent without the need of laboratory testing. Many small tributaries and drainage channels were dry. Even more sites were reduced to a trickle and two stream sites (Pine Mountain Road on Butler Creek and Maxham Road on Buttermilk Creek) on main channels stopped flowing.

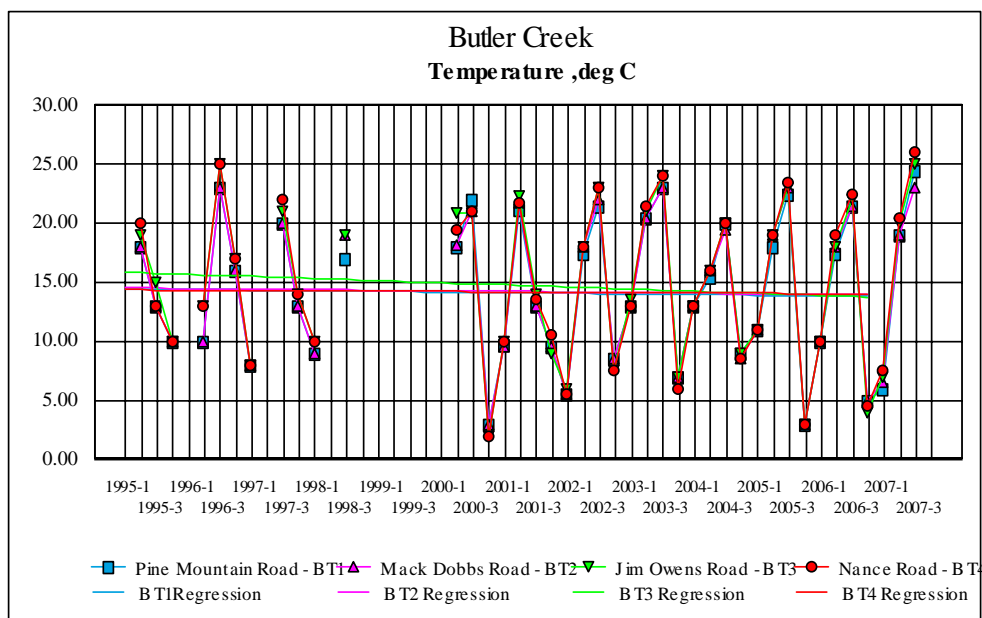
In the Piedmont Eco-Region, our streams are primarily classified as riffle & run streams. Water is typically shallow and moves quickly through the channel only encountering slow moving deep pools periodically along its course. The riffle portion of this classification creates turbulence in the stream and helps to oxygenate the water. The run occurs after a riffle when the velocity of water decreases, there is less turbulence and depth begins to increase. Following the riffle & run complex the flow sometimes enters a pool. Water here moves very slowly and can increase substantially in depth. Aquatic organisms have adapted to thrive in different sections of flow; fish in riffles are long and torpedo shaped to minimize water resistance. Conversely, fish that thrive in pools are tall with broad bodies that would not suit life in a riffle. Alterations to flow caused by drought can drastically impact the aquatic community. As the water becomes scarce, the volume in a stream channel decreases, velocity of flow drops, there's less turbulence in riffles and as a consequence, the level of dissolved oxygen available to organisms drops.



*For all sites on Butler Creek, dissolved oxygen measurements taken on August 9, 2007 are lower than the single lowest previously measured D.O. value.*

As water supply diminishes more, riffles and runs are reduced to trickles, and areas of pooling increase. Beyond that, the stream becomes a series of puddles with little if any flow moving between pools. In the latter stages of this scenario, as riffles decrease, organisms suited for fast moving water must move into unaccustomed habitat or die. Pool organisms are being stressed as well. With less moving water, there's less dissolved oxygen entering pools and also fewer nutrients. Pollutants, if any, are no longer diluted and transported downstream. If present they begin to accumulate in pools and concentrate as water levels decrease. Additionally, with very little flow entering or leaving the pool, the sun

begins to heat the water. As temperature changes many biological and chemical processes change too. For example, the warmer the water, the less dissolved oxygen water can hold. Warmer temperatures may also lead to rapid plant and algae growth as well as impacting other biological functions. Aquatic organisms are only capable of withstanding limited temperature ranges and fish, in particular, often succumb to the elements when temperature thresholds are exceeded.



*On August 9, 2007, Butler Creek sites recorded the highest average temperature and recorded the single highest temperature of any previous sampling.*

Many of our streams reached this level of stress during 2007 and some progressed even further. Until the benthological samples are processed we won't be certain if the drought had a measurable impact on the biological community. However, lower water levels left many quality aquatic habitats high and dry. Tree roots, normally submerged in water and providing habitat for fish and macroinvertebrates, often did not reach the diminished water levels. Some streams with braided channels only had enough water to provide flow to one channel, leaving large portions of the stream bed dry. And in the most extreme cases, some major stream channels went completely dry for over 100 yards. Such severe impacts force aquatic populations to disperse in search of suitable habitat. During the spring/summer of 2008, the Watershed Monitoring Program plans to sample the fish community and determine which species have returned and see if the populations have declined in numbers or diversity from previous samples. Macroinvertebrates will also be collected in the fall/winter season and compared to sample collections before and during the drought.

It will also be very interesting to monitor changes in the geomorphology of the stream channel throughout the remainder of the drought and when the rains return. Since large portions of the stream channel were dry during 2007, vegetation began to creep into previously unavailable reaches. Large areas of sandy and rocky deposition became islands or point bars throughout the stream reach. While these areas typically receive flow and consistently uproot new vegetation, in 2007 many plants were able to grow and begin to establish deep roots. Areas of stream banks that were unstable and often eroded during storm events were not subjected to the normal destructive forces of high water events. Some of these banks dried out, sprouted vegetation and began to stabilize. When normal flow returns to our streams it will be interesting to see if new channels are carved around established sand bars, if previously erodable stream banks are stable enough to withstand high flows and which new plants and trees are able to survive in their new territory.

Although the 2007 drought has stressed the stream ecosystem, the biological community is resilient and constantly adapting to change. When the rains fall again and flow of water returns to normal, fish will repopulate, new habitat will be created and macroinvertebrates will begin to occupy new territory. Due to the complexity of relationships within the system it may be many years before we can really conclude how the drought affected our streams. Only as data is processed and new data is collected can we begin to understand the changes that have taken place. Years of historical data will prove their value as a tool for comparison and will demonstrate the importance of continued field work. By comparing past, present and future data we may, one day, understand the impacts of our epic dry spell and be better prepared for future droughts.



# Biodiversity Spotlight: Imperiled Mussels of the Southeast

by Erin Feichtner, Cobb County Watershed Monitoring

When the Southeastern drought began to make headlines this past summer, it brought the struggle of imperiled mussels to national attention. The United States supports nearly 300 species of mussels, while all of Europe contains only 12 species. It is estimated that nearly 70% of our freshwater mussels are extinct, endangered, or in need of special protection. Many problems stem from how mussels live and the changes to their environment during the past 200 years.

## Alabama Coosa Tallapoosa Basin (ACT) and Apalachicola Chattahoochee Flint Basin (ACF)



The Alabama, Coosa, and Tallapoosa Basin (ACT) is called a hotspot of biodiversity. However, we have already lost some of that biodiversity. Eleven species of mussels in the ACT basin are currently federally listed. The Etowah River once included 43 mussel species, now we know of none. The Coosa River once held 36 native mussel species, now only four are known. The Conasauga River once included 43 mussel species, now we know of only six. Cobb's streams that flow into Lake Allatoona are part of the ACT basin.

The Apalachicola-Chattahoochee-Flint Basin (ACF) houses six endangered and threatened mussel species. These mussels are: Fat threeridge mussel, Shinyrayed pocket-book, Gulf moccasinshell, Oval pigtoe, Chipola slabshell, and Purple bankclimber. All six mussels were federally listed under the Endangered Species Act on March 16, 1998. Cobb streams that flow to the Chattahoochee River are part of the ACF basin.

Unfortunately, stream habitat in metro Atlanta has been degraded beyond the threshold of what is required to support these sensitive mussels. In Cobb County we have a native, common and widespread mussel living in our lakes, the Giant Floater, *Pyganodon grandis*. But our most ubiquitous bivalve is the invasive Asian Clam, *Corbicula*. *Corbicula* is a generalist that thrives in unstable substrate, while native mussels cannot. *Corbicula* can be found in large numbers in all Cobb streams.

## Biology

Mussels are bivalve mollusks which live in the sand and gravel bottoms of streams and rivers. They require good water quality, stable stream channels and flowing water. If receding water levels leave them exposed they will desiccate and die. Mussels filter bacteria, algae, and other small plants and animals out of the water to feed. Larvae of mussels are parasites on the gills and fins of freshwater fishes, including darters, minnows, and bass. The host fish is used for dispersal and is caused little to no harm. Many mussels use lures that mimic minnows, worms, leaches, or aquatic insects to attract fish hosts. Predators of the mussel include: fish, turtles, muskrats, raccoons, otters, and birds.

## Why are freshwater mussels so imperiled?

Non-point source pollution is one of the biggest threats to mussel survival and water quality in general. Sedimentation also continues to have a negative effect on populations. Habitat losses from channelization, clearing of riparian and streambank vegetation, dredging, and dam construction continue to exist. Mussels are impacted by the loss of fish hosts for their larvae or dams or other barriers to fish migration. These modifications keep fish and mussels from dispersing, resulting in small, isolated populations. Poachers may take more than allowed by regulations set forth by conservation agencies. Non-native mussels such as the zebra mussel in the Great Lakes Region, or Asiatic clam in the southeast, may out-compete native mussel species.

### Why should we care about mussels?

A healthy mussel population indicates a healthy aquatic system. When mussel populations are at risk, it indicates a problem for other aquatic organisms, wildlife, and our water resources. Mussels are natural filter feeders, cleaning the water. They are an important food source for many animals. Native Americans once used mussels as food and the shells were used for ornamentation, tools, and as a commodity for trade. Historically, these mussels were economically important, as buttons were made out of their shiny shells. Today, some native species of mussel are important in the pearl industry. It has been found that some mussels do not get cancer. Scientists would like to know why and preserve mussel species as they may have additional values in the future that we cannot predict now.

### What can we do?

Biologists from the U.S. Fish and Wildlife Service (USFWS) and the U.S. Geological Survey along with other Federal, State, and private organizations are working together to find solutions to problems facing mussels. The role of the USFWS is to represent fish and wildlife and administer the Endangered Species Act of 1973. Endangered species are so rare they are in danger of becoming extinct.

On the local level, we can do several things to protect mussels. We can limit or cease pesticide use, control soil erosion by planting trees and plants and conserve water.

### Sources:

<http://www.fws.gov/southeast/news/2007/images/7MusselsFactSheet.pdf>

<http://www.fws.gov/southeast/drought/ACT-BasinQ-A.pdf>

Fat threeridge mussel  
*Amblema neislerii*



Gulf moccasinshell  
*Medionidus penicillatus*



Chipola slabshell  
*Elliptio chipolaensis*



Shinyrayed pocketbook  
*Lampsilis subangulata*



Oval pigtoe  
*Pleurobema pyriforme*



Purple bankclimber  
*Elliptioideus sloatianus*



## Schedule of Events

### Watershed Stewardship Fair

Date: Wednesday, February 27<sup>th</sup>  
 Time: 7:00 pm - 9:00 pm  
 Location: Water Quality Lab  
 Cost: free  
 Call: 770-528-1482

### Adopt-A-Stream Workshop: Chemical Monitoring

Date: Saturday, March 1<sup>st</sup>  
 Time: 10:00 am - 1:00 pm  
 Location: Water Quality Lab  
 Cost: free  
 Call: 770-528-4070

### Biodiversity Basics Educator Workshop

Date: Tuesday, March 4<sup>th</sup>  
 Time: 4:00 pm - 9:00 pm  
 Location: Cartersville  
 Cost: \$25.00  
 Call: 404-876-2900 x113




### Environmental Education Alliance of GA Conference

Date: March 14<sup>th</sup>-16<sup>th</sup>  
 Location: Unicoi State Park  
 Cost: \$175.00  
 Info: [www.eealliance.org](http://www.eealliance.org)



MCAA student at the stream

# March 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			27 Watershed Stewardship Fair	28	29	1 Chemical Workshop
2	3	4 Biodiversity Workshop	5	6	7	8
9	10	11	12	13	14	15
					EEA Annual Conference	
16	17 	18	19	20 Spring Begins 	21 Holiday Good Friday	22 World Water Day
23 	24	25	26	27	28	29
30	31	AAS Workshops upon request				

## Welcome, New Adopt-A-Stream Volunteers!

### *McEachern High School Students*

Gretchen Davis and her Advanced Placement Environmental Science class have adopted two sites—the pond on their school property and a tributary of Noses Creek.

### *Marietta Center for Advanced Academics (MCAA) Rockets*

Susie Throop, Kara Householder, Celesta Shannon, Jennifer Bundy, Deanie Brands, and their Fourth Grade students have adopted two sites on the MCAA campus - Victory Creek and a tributary of Rottenwood Creek.

### *Girl Scout Troop 2441*

Holly Willis and her Girl Scouts have adopted three sites in the Noonday Creek watershed in Kennesaw.

### *Riverstone Middle School*

Dierdre Baker and her students have adopted a pond at Lost Mountain Park.

### *Rock Griswold*

Rock has adopted a portion of Sope Creek that runs along his property.

# April 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5 Biological Workshop
6	7	8 Water Efficient Landscape Workshop	9	10	11	12
13	14	15	16	17	18 Schoolyard Habitat Workshop	19
20	21	22 	23	24	25 Rain Barrel Workshops	26
27	28	29	30	1	2	3

## Schedule of Events

### Adopt-A-Stream Workshop: Biological Monitoring

Date: Saturday, April 5<sup>th</sup>  
 Time: 10:00 am - 2:00 pm  
 Location: Water Quality Lab  
 Cost: free  
 Call: 770-528-4070

### Water Efficient Landscape Workshop

Date: Tuesday, April 8<sup>th</sup>  
 Time: 11:30 am - 1:00 pm  
 Location: Water Quality Lab  
 Cost: free  
 Call: 770-419-6244

### Schoolyard Habitat Educator Workshop

Date: Friday, April 18<sup>th</sup>  
 Time: 3:30 pm - 8:30 pm  
 Location: Water Quality Lab  
 Cost: \$25.00  
 Call: 404-876-2900 x113

### Rain Barrel Workshops

Date: Friday, April 25<sup>th</sup>  
 Time: 10:00 am, 1:00, 3:00 pm  
 Location: Water Quality Lab  
 Cost: free  
 Call: 770-419-6244

## Recommended Reading

### Earth Day Ecological Footprint Quiz

<http://www.earthday.net/footprint/>

"Ever wondered how much "nature" your lifestyle requires? You're about to find out.

This Ecological Footprint Quiz estimates how much productive land and water you need to support what you use and what you discard. After answering 15 easy questions you'll be able to compare your Ecological Footprint to what other people use and to what is available on this planet.

The quiz is based on national consumption averages and is meant to give you an idea of your Ecological Footprint relative to other people in the country you live in. It is not highly detailed, but should give most people an idea of where they stand.

If you already live a sustainable lifestyle, do not be discouraged by your results. There are some portions of your Footprint that are not the direct result of your consumption habits. For example, each resident of a city is 'responsible' for a portion of the city's infrastructure, such as roads, schools, and government offices, regardless of whether the resident uses those services. In addition, some options that could make your Footprint smaller are not available to you as a result of choices on the part of local decision makers, such as reliable and efficient public transportation as an alternative to driving. Therefore, an important path to reducing your Footprint is to advocate for more sustainable decisions at all levels of government. This will make it easier for you and many others to reduce Ecological Footprints."





# Cobb County Watershed Stewardship Program

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*Cobb County...Expect the Best!*



## Living Blue Challenge 2008

The *Living Blue Challenge* is part of our Earth Day celebration and encourages participants to take small measures for improved water quality. Citizens register/pledge participation and complete actions to earn "blue points". Once 100 points are earned, send the completed form to Cobb Water. Participants will receive a certificate, and are entered into a monthly drawing for a \$100.00 gift card to the Georgia Aquarium. Drawings will be held in March, April, May, and June. Download the register/pledge form and the blue points action form at [www.cobbwater.org/aas.htm](http://www.cobbwater.org/aas.htm).

20 actions residents can take to improve water quality:

1. Install a rain barrel(s)
2. Compost kitchen and yard waste
3. Plant a tree in your yard or in a park
4. Switch to "green" household products
5. Create and certify a pollinator garden/wildlife habitat in your yard or neighborhood
6. Recycle!
7. Pick up your pet waste and dispose of it responsibly
8. Mark the stormdrains in your neighborhood
9. Register with Direct Marketing Association (DMA) to reduce junk mail
10. Install a rain garden in your yard using native landscape plants
11. Reduce/eliminate landscape chemicals; use organic alternatives instead
12. Bring your own bags to the store instead of using disposable plastic bags
13. Buy locally grown produce
14. Drink tap water instead of bottled water
15. Sweep it up! Don't spray it off
16. Participate in a watershed cleanup event
17. Fix any auto leaks immediately/check your tire pressure to ensure proper inflation
18. Bring your own plates, mugs, and utensils to work instead of using disposables
19. Attend a Watershed Stewardship Workshop
20. Adopt your local creek, lake, or wetland