Cobb County Watershed Stewardship Program

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Editor: Jennifer McCoy

The Thalweg

Watershed Stewardship Fair

Held on November 11, 2006, Cobb County's first Watershed Stewardship Fair was an amazing evening that showcased the efforts of Cobb's Watershed Stewards. Over 50 volunteers attended, about 45% of our Adopt-A-Stream groups. It was a true networking event with people introducing themselves and sharing ideas. Staff from Georgia River Network, Georgia Adopt-A-Stream, Georgia Conservancy and Upper Chattahoochee Riverkeeper also attended our event.

AAS group displays at the Fair

Each volunteer group created a poster that was displayed in the Water Quality Lab. During the event the group was also given the floor for a few minutes to share their experiences and ideas. Sixteen groups participated with representatives from several schools, homeowners associations, families, environmental groups and civic organizations. In planning an event to recognize all our volunteers, teachers were encouraged to extend the invitation to their students who added a great dimension to the group. The opportunity to participate in tours of the Water Quality Lab was a big enticement for the parents and students in attendance.

The format was similar to a science fair for both adult and youth participants. Also started was an annual recognition tradition of presenting a Volunteer-of the-Year award. During presentations it became very clear how important it is to provide AAS volunteers with a forum to speak openly to a receptive community that shares their concerns. It was wonderful listening to them speak so passionately about their ideas and observations.

Volunteer Survey

The Watershed Stewardship Program is in it's fifth year. It's time to take a critical look at how this program will move forward. Part of this evaluation is gaining insight and feed-back from program participants. Participants were emailed a survey last fall to obtain this information. Volunteer feedback shows strong support for the need to foster community connections, showcase the impact of volunteer efforts, and see the data collected being used. So, how can we do that? The Watershed Stewardship Fair was a great start. We are also making changes in the newsletter and forming the Community Ecological Education Committee to help assist with developing the 2007 Watershed Stewardship Fair and other empowering events. If you are interested in participating in this group or have ideas to share, email jennifer.mccoy@cobbcounty.org

Inside this issue:

Special points of interest:

- Renew your AAS Chemical Monitoring Certification at the 3/24 Workshop
- Celebrate Earth Day with Cobb Water: A Day of Rain Barrel Workshops on 4/20
- Teachers can earn 1 PLU by attending our EE Curriculum Courses 4/27 & 4/28

Dissolved Oxygen and Temperature Levels in Butler Creek

by Erin Feichtner, Cobb County Stream Monitoring

Butler Creek flows through Northwest Cobb County and flows into Lake Acworth, within the Etowah River Basin. The Etowah River Basin is a highly biodiverse and highly imperiled ecosystem with many endemic species. Physical and chemical composition of a stream is important because it determines which species may or may not be present in a system. Physical and chemical parameters such as temperature, dissolved oxygen (D.O.), habitat such as rocky riffles, woody debris, leaf packs, and vegetative margins (root wads) may effect whether a species is present. Butler Creek possesses good water quality and adequate habitat diversity. Most monitoring sites consist of riffles of gravel to cobble sized stones and bedrock, roots, woody debris, and deep pools. Bank erosion is severe in some areas, and increasing sedimentation is evident. The surrounding watershed is rapidly developing. Still, Butler Creek supports a good diversity and abundance of macroinvertebrates and sensitive fish species.

Butler Creek at Mack Dobbs Road

Butler Creek flowing into Lake Acworth

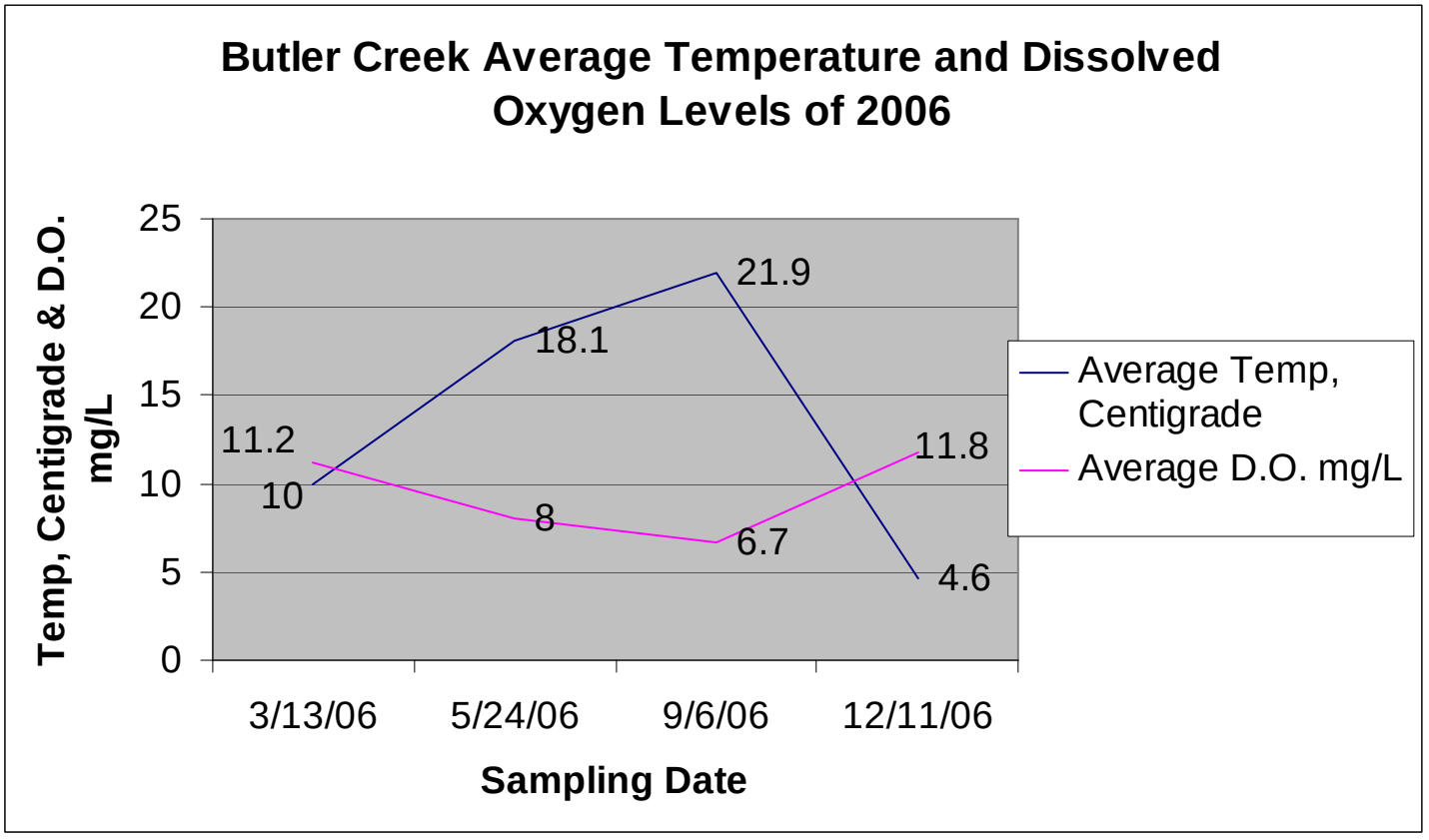
Temperature is one factor affecting species. Temperature affects feeding, reproduction and the metabolism of aquatic animals. Usually, fish larvae and eggs have a more narrow temperature requirement than adult fish. One week of unfavorable temperatures may be enough to wipe out a sensitive species, even if temperature is within range the rest of the year. Temperature preferences vary among species. Trout and stonefly nymphs require cooler waters. Bass, crappie, bluegill, carp, and catfish are comfortable in warmer waters, but the warmer the water the more the chance for fish diseases increase. Rapid changes of temperature may cause more damage than a slow, seasonal change. Thermal stress and shock can occur when the water temperature changes more than a few degrees in a 24 hour period. Water temperatures can be increased by discharge from industry or runoff from impervious surfaces. Groundwater emerging from springs and shade provided by tree canopy can lower water temperatures.

Like us, aquatic organisms also require oxygen to live. Oxygen dissolves readily into water from the atmosphere at the surface until the water is “saturated”. Riffles and waterfalls aerate the water, adding oxygen. Aquatic plants, algae and phytoplankton produce oxygen during photosynthesis. The dissolved oxygen capacity of the water is limited by temperature. As the water temperature changes, the highest potential dissolved oxygen level changes. Water temperature and dissolved oxygen levels are inversely proportional. The lower the water temperature, the higher the potential dissolved oxygen level. The higher the temperature, the lower the potential dissolved oxygen level. At 0 degrees Celsius the saturation point for dissolved oxygen is 14.6 ppm. At 32 degrees Celsius the saturation point for dissolve oxygen is 7.6 ppm. This temperature effect is compounded by the fact that organisms increase their activity in warm water, requiring more oxygen to support their metabolism. Critically low oxygen levels often occur during the summer months when capacity decreases and oxygen demand increases.

As you can see, it is important to measure dissolved oxygen and temperature to ensure a healthy stream environment. Butler Creek supports a variety of macroinvertebrates and fish. Below are the Stream Monitoring Program's 2006 results for temperature and dissolved oxygen levels in Butler Creek.

Butler Creek Data

Date	Parameter	Pine Mtn	Mack Dobbs	Jim Owens	Nance	Average All Sites
3/16/06	**Temp.˚C**	10	10	10	10	**10.0**
	D.O., mg/L	11.1	11.8	11.6	10.1	**11.2**
5/24/06	**Temp.˚C**	17.5	18	18	19	**18.1**
	D.O., mg/L	8.1	8.1	8.4	7.4	**8.0**
9/6/06	**Temp.˚C**	21.5	21.5	22	22.5	**21.9**
	D.O., mg/L	7.2	7.0	6.5	6.0	**6.7**
12/11/06	**Temp.˚C**	5	5	4	4.5	**4.6**
	D.O., mg/L	11.6	11.79	11.9	11.72	**11.8**



Biodiversity Spotlight: The Cherokee Darter

by Erin Feichtner, Cobb County Stream Monitoring

Nomenclature: The Cherokee Darter, *Etheostoma scotti* is a small freshwater fish of the family Percidae. The genus name *Etheostoma* means strain mouth, perhaps referring to the small mouth; the species name *scotti* is in honor of Donald C. Scott, who established the University of Georgia ichthyological collection. The largest numbers of Cherokee Darters are located in Cherokee County, hence their common name. Darters owe their name to their habit of darting along the bottom of streams in quick wiggles and jolts. They use their pelvic and caudal fins to rest on the bottom and move in short, erratic bursts.

Cherokee darter , *E scotti* (male 55 mm standard length) Shoal Creek Dawson County GA). *Photo by Noel M Burkhead*

Biology and Habitat: Cherokee darters are a small (1.6 to 2.6 inches long) fish, subcylindrical in shape, with a blunt snout slightly overhanging a subterminal mouth. The pale yellow body is pigmented with eight small dark saddles and six or more bands on the sides. Red bands are present on the fins of breeding males. This darter spawns from March through June. Females deposit single eggs in small depressions or recesses on the surface of large gravel, small cobble, and occasionally woody debris within runs and riffles. Males follow behind and fertilize each egg as it is deposited. An individual lives two to three years. The Cherokee Darter is an obligate benthic species, living, foraging, and spawning on the stream bottom. Their well-being is connected to benthic habitat quality. This little fish requires small to medium sized streams. It depends on shallow pools and runs over gravel and large rocks for feeding and reproducing. It feeds on aquatic insect larvae, such as midge and black fly larvae. It is associated with large gravel, cobble, and small boulder substrates, and is uncommonly or rarely found on bedrock, fine gravel, or sand. It requires relatively clear water and clean substrates with little silt deposition, and is intolerant of impoundment.

Distribution and Geography: The Cherokee Darter is endemic to the Etowah River Basin, meaning it is only found in that river system and no where else in the world. The Cherokee Darter is found throughout the middle and upper Etowah and its tributaries, since the lower Etowah tributaries contain Coosa darters, not Cherokee. Isolated populations of Cherokee Darters can be found in Allatoona, Little Allatoona, Butler, and Proctor Creeks in Cobb County. These populations are cut off from other Cherokee Darter populations in the main stem of the Etowah and its other tributaries by the Lake Allatoona impoundment that the small darter fish cannot traverse. Noonday Creek is within the Etowah drainage, but the Cherokee Darter appears to be extirpated from this tributary, as the fish is not currently found in the Noonday drainage. Unfavorable stream habitat, especially the loss of the necessary gravel and cobble riffle habitat due to silt and sand sedimentation, is believed to be the main cause of the extirpation.

Status: The Cherokee darter was officially recognized as a distinct species in 1995 (Bauer et al., 1995) and was federally listed as a threatened species under the Endangered Species Act by United States Fish and Wildlife Service that same year. The Georgia Endangered Wildlife Act currently lists the Cherokee Darter as threatened. Major threats to the species' survival include habitat loss due to dam and reservoir construction, habitat degradation, and poor water quality, according to the U.S. Fish and Wildlife Service.

Four species of Darter have been found in Cobb: Blackbanded, Speckled, Bronze and Cherokee

Protection for the Future: The Etowah Habitat Conservation Plan (HCP) strives to enhance the Etowah watershed through protection of aquatic species and water resources, ensuring continued economic prosperity and quality of life for future generations. The Etowah HCP is focusing on minimizing impacts from residential, commercial and industrial development on the threatened Cherokee darter and other endangered fish. The Etowah HCP is based on a series of policies supported by research and agreed upon by local governments, designed to protect the basin's imperiled aquatic species as development occurs in the region.

The Cherokee Darter and You: If you are lucky enough to have adopted a stream in the Etowah Basin, there is a possibility that you share your stream with the threatened Cherokee Darter. Populations of the Cherokee Darter have been found in Allatoona, Little Allatoona, Butler, and Proctor Creeks. If your adopted reach contains the fish's rocky riffle and run habitat, take care performing your riffle kicks. The Cherokee Darter may appear similar to other species of darter and they are difficult to tell apart. In fact, the Cherokee Darter can only be distinguished from the Coosa Darter by looking at the red banding of the fins of males in breeding colors. If you do accidentally scoop up a fish in your net, just return it to the water unharmed as these fish are protected by the Endangered Species Act.

Sources: Bauer, B. H., D. A. Etnier, and N. M. Burkhead. 1995**.** Etheostoma (Ulocentra) scotti (Osteichthyes: Percidae), a new darter from the Etowah River system in Georgia. Bulletin of the Alabama Museum of Natural History 17:1-16.

Federal Register of December 20, 1994. 50 CFR Part 17, Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Cherokee Darter and Endangered Status for the Etowah Darter

The Etowah Habitat Conservation Plan (HCP) http://www.etowahhcp.org

Site of the Season: Butler Creek at Lake Acworth

by Mark Cearfoss, Environmental Science Teacher at North Cobb Christian School

Butler Creek, upstream of Nance Road

The Environmental Science class at North Cobb Christian School gets lots of hands-on experience as they monitor Butler Creek located behind the school on Corps of Engineers property. This section of creek is approximately 700 yards from where it empties into Lake Acworth which is tied to Lake Allatoona and overall the Coosa River Watershed. The creek is approximately 53 feet wide and at its deepest, 8 feet from the top of the bank to the stream-bed as it flows through this area.

The NCCS science department began monitoring the creek in 2002 as part of the Environmental Science curriculum. Students do chemical monitoring once a month and have discovered one of the most interesting facts is the cause and effect of the air temperature on dissolved oxygen. In August, it dropped to 6.6 with the summer heat and rose to 12.2 with the cold December weather. Alkalinity has ranged from a low of 40 mg/L to a high of 60 mg/L.

This section of Butler Creek gets a large amount of storm water runoff which washes away much of the macroinverte-brates typically found in creeks. There is also a sewer line easement that parallels the creek and provides level ground for ATV and 4 wheelers that disturb the soil and cause erosion to the flood plain. This erosion and the illegal dumping that occurs in this section of the creek are two major problems in keeping the creek, its banks and surrounding area clean and flourishing. Trash and construction debris is picked up on a regular basis and occasionally illegal deer blinds are confiscated. Once a year in the spring, the class holds a major cleanup that is advertised among the families at NCCS and the local community, providing an opportunity for volun-teerism and increasing public awareness of the issues that jeopardize not only this section of Butler Creek, but the lakes and watershed it feeds.

North Cobb Christian's Environmental Science Class

Schedule of Events

Rain Garden Workshop

Date: Thursday, 3/15
Time: 6:30 pm -8:00 pm
Location: Water Quality Lab
Cost: Free

AAS Chemical Workshop

Date: Saturday, 3/4
Time: 10:00 am - 1: 00 pm
Location: Water Quality Lab
Cost: Free

GA Water Resource Conference

Date: 3/27 - 3/29
Location: GA Center, Athens
Cost: $185.00
www.gwrc2007.org

Environmental Education Alliance Annual Conference

Date: 3/30 - 4/1
Location: Jekyll Island
Cost: $230.00
www.eealliance.org

March 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15 Rain Garden Workshop	16	17
18	19	20	21	22	23	24 AAS Chemical Workshop
25	26	27 GA Water Resource Conference	28	29	30 EEA Annual Conference	31

Life is a River - new AAS volunteer groups

Students from Nicholson, Blackwell, Keheley, Rocky Mountain, Austell Intermediate and Davis Elementary Schools have been submitting stream data to our program.

Cobb AAS has some new partners this year: third graders. Several schools in Cobb County have chosen to participate in a watershed education program called *Life is A River*.

"Life is a River is the first part of a year long unit written for third grade gifted students. It is followed by *FLOW* where students will use and apply their knowledge through action research. *Life is a River* introduces the concepts of water, water cycle, man-made water cycle, rivers, streams and tributaries (especially the Chattahoochee River and its tributaries), and how to conduct visual, chemical, and biological assessments. The first part of this study is the background knowledge and training for monthly assessments to be conducted at a stream in their community during the second semester.

The goal of this unit is to help students develop a sense of pride, awareness, and appreciation for their environment. It is to understand the interdependence between animals and their environment and to nurture a realization that they can help save our most precious natural resource, water. The ultimate goal is to create life-long guardians of the environment.

This unit is a good fit to meet the emotional and social needs of a third grade student. It challenges students with higher level vocabulary and concepts while helping students individuate and become responsible for protecting their environment as well as to work with other team members to solve problems." Except from *Life is A River* Unit Overview

April 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 EEA cont.	2	3	4	5	6 Holiday	7
8	9	10	11	12	13	14
15	16	17	18	19	20 Rain Barrel Workshops	21
22	23	24	25	26	27 Flying Wild Workshop	28 Leopold Workshop
29	30					

Spring Break for Cobb County Schools

Schedule of Events

Rain Barrel Workshops

Date: Friday, April 20th
Time: 10:00, 1:30, 4:00
Location: Water Quality Lab
Cost: Free

Flying Wild Educator Workshop

Date: Friday, April 27th
Time: 4:00 pm -8:30 pm
Location: Water Quality Lab
Cost: $20.00
www.georgiaconservancy.org/Events/List.asp

Leopold Education Project Educator Workshop

Date: Saturday, April 28th
Time: 9:00 am –2:30 pm
Location: Water Quality Lab
Cost: $30.00
www.georgiaconservancy.org/Events/List.asp

Recommended Reading

Water: A Natural History by Alice Outwater

"In *Water: A Natural History,* Alice Outwater takes us on a journey that begins 500 years ago, back to the wardrobe records of the kings of France and the diaries of the first Western explorers, to recover a lost knowledge — how the land cleans its water. *Water* moves from the reservoir to the toilet, from the grasslands of the Midwest to the Everglades of Florida, through the guts of a wastewater treatment plant and out to the waterways again. Step by step, we come to learn what should have been done from the beginning: A complex ecological system long kept American water remarkably clean but as we have randomly removed necessary components from it, we have simplified the system to the point where it can no longer do its job. While engineering can de-pollute water, only these ecologically interacting systems can create healthy waterways. *Water* is the unforgettable story of the symbiosis that existed between the country's water, the land from which it springs and the life the two support together. It is a story that none of us who hope to live on this planet can afford to miss."

Book review from www.Powells.com

Keep in mind, Cobb's Water Quality Lab has many wonderful publications that volunteers are welcome to check out. We are in the process of compiling a comprehensive eco-literacy reading list. Let us know if you have a suggestion or if you would like to review a book for this article.

Cobb County Watershed Stewardship Program

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Cobb County...Expect the Best!

Volunteer T-shirt Update

And the winner is...

Art work by Bruce Henry
KSU graphic design student

For the fifth year Cobb County was fortunate to partner with Kennesaw State University to provide our volunteers with multiple design options in selecting a graphic for the 2007 Volunteer Service T-shirt. For Cobb County, sponsoring a design contest gives us a diverse collection of artwork to pick from without having to work closely with an artist to develop specific concepts. For KSU students, this contest becomes part of the graphic design curriculum for the fall classes, giving students the opportunity to work on a real world design project. Volunteers select the design to be printed on the t-shirt from the submissions, and the designer is awarded a cash prize for their work. The complete collection of this year's student designs was on display at the Watershed Stewardship Fair in November. The attendees helped select the winning design.

An artist statement about the work being submitted accompanied each graphic . Here is what Bruce Henry said about his project: "Inspired by nature itself, my design is composed of five small vignettes with the central theme being the stream and all its beauty. The drawings surrounding the stream are simplistic in design yet the line quality lends itself to the over all design. The colors chosen give a rustic feel of nature's rawness while emphasizing its complexities."

The t-shirts have been ordered and will be available for distribution this spring.