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2008 Volunteer Awards

This past year, we had a record number of volunteers participating in Adopt-A-Stream, as well as our new Frog and Toad Monitoring initiative and Stormdrain Marking. We are lucky to have ALL of our wonderful volunteers who embrace their role as stewards of the environment. In 2008, we had some outstanding volunteers that went above and beyond the call of duty. They were awarded for their efforts at the 2009 Watershed Stewardship Fair in February.

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2008 Volunteers of the Year

Tim Phillips and Stacey Haire have been active AAS volunteers since 2006. They are members of the Sierra Club Cobb Centennial Group and monitor Rottenwood Creek near Powers Ferry Road. Always reliable for their accurate and consistent data, we are proud to acknowledge their service to our environment!



2008 Stormdrain Markers of the Year

Girl Scout Troop 21 and their leader, Karen Faucett, marked 168 stormdrains in 11 neighborhoods last summer. The aluminum discs bear the words "No Dumping, Leads to Creek". They also distributed informational fliers for each home to explain how stormdrains have an effect on water quality. Thanks to their hard work, the message is getting out!



Special Events of Interest...

- Stormdrain Marking Day on 5/9
- Monarchs Across Georgia Plant Sale on 5/9
- Cool Waters Workshop on 6/10 through 6/12
- River Rendezvous on 6/20
- Paddle Georgia on 6/20-6/26
- Bat Workshops on 7/21 & 7/28

2008 Frog and Toad Monitor of the Year

Connie Ghosh has been an active AAS volunteer since 2006. Not only does she conduct chemical and biological monitoring near McCleskey Middle School, but she recently joined our Frog and Toad monitoring Initiative. Connie has been diligent in listening for anurans near her home and sending in data. Thanks for your dedication, Connie!



A Comparison of Georgia Methods for Macroinvertebrate Assessment

By Erin Feichtner, Cobb County Stream Monitoring

Biological monitoring of macroinvertebrates (aquatic insects, crustaceans, worms, and mollusks) is an important tool in assessing both water quality and habitat. The abundance and diversity of macroinvertebrates is an indication of overall stream quality. Different assessment protocols have been developed to successfully sample macroinvertebrates and assess stream quality. An important factor in gathering reliable data is having a well thought-out, standardized methodology that is applicable to the type of study being conducted. Many methods have been developed and formatted to suit this purpose, including two commonly used in Georgia. The Georgia Adopt-A-Stream's (AAS) Assessment Protocol is utilized by volunteers throughout the state, while the Macroinvertebrate Biological Assessment of Wadeable Streams in Georgia Standard Operating Procedures (SOP) is used by professionals for regulatory purposes

Both plans are similar conceptually but have significant differences in their design. The AAS protocol is designed to give a general overall assessment and simple enough to be utilized by citizen volunteers. Volunteers attend a macroinvertebrate workshop where they learn the Assessment Protocol and learn to identify macroinvertebrate larvae to order (Ephemeroptera, Plecoptera, Trichoptera, etc) and family (Diptera) in some cases. The State of Georgia's SOP is designed to thoroughly examine macroinvertebrate populations in order to gain detailed knowledge on how environmental factors could be affecting them. Since 1999, Adam Sukenick and Erin Feichtner, of Cobb County Stream Monitoring (CCSM), have been utilizing Georgia's SOP for biological sampling to fulfill the county's Wastewater Reclamation Facilities' National Pollutant Discharge Elimination System (NPDES) permit requirements. Stereomicroscopes and taxonomic keys are used by CCSM to identify macroinvertebrates to the genus or species level. While both of these sampling plans share the same basic premise, CCSM has the resources for a detailed and in-depth look at macroinvertebrate populations and to assess stream health. Volunteers throughout the county

frequently assess many different stream sites. If a problem is found, Cobb County can be notified and CCSM can perform further testing to trace and identify the origin of the problem.

Seasonal variations may affect macroinvertebrate populations and assessment results. Populations vary during peak emergence and reproduction, which typically occur in the spring and fall. Biologically optimal periods when populations are stable start in the fall and continue through winter. Georgia's SOP Optimal Sampling Index Period is mid-September through February. CCSM samples their 24 biological sites during this period every year. AAS assessment protocol calls for biological monitoring quarterly, or 4 times a year. With this procedure you may get population variation by season, but if continued for several years, you can compare yearly sampling events in similar seasons.



Mesh bucket with stream monitoring sample

Photo by Cobb County Water System Stream Monitoring

The Muddy Bottom Adopt-A-Stream Assessment Protocol is utilized in Cobb as some of our stream bottoms are mainly sediment and lack riffle areas. The Muddy Bottom Protocol calls for sampling 7 scoops from vegetated margins, 4 scoops from woody debris with organic matter, and 3 scoops from substrate, which may consist of sand, rock, or gravel. The Georgia SOP that CCSM utilizes is the 20 Jab Method sampling 5 habitats in a 100 meter reach. These habitats consist of: 3 fast riffles, 3 slow riffles, 5 woody debris/snags, 3

undercut banks/rootwads, 3 sand, and up to 3 macrophytes if present. When habitats are not present, jobs will be reallocated giving priority to the habitats as they are listed above. This allows an equal level of effort, 20 (+3) jabs or kicks, to be obtained at biomonitoring sites. Macrophyte jabs are not included as part of the reallocation of habitat and are not reallocated if the habitat is missing.

After the sample is collected, AAS assessment protocol calls for the volunteer to transfer the sample to a pan with some water and pick through to find and identify macroinvertebrates, consulting AAS's *Macroinvertebrate Field Guide For Georgia's Streams*, if necessary. The SOP that CCSM follows is more in-depth so that the data may be used for regulatory purposes. When sampling is complete, the sample is thoroughly inspected and washed. All detritus (leaves and sticks) are inspected and washed on a series of sieves over a 500 μ m open mesh bucket. Any large individuals are picked from the sample and deposited in the sample container. Upon completion, all of the fine detritus and macroinvertebrates left in the bottom of the 500 μ m bucket are preserved in a sample container with ethanol. Containers are always labeled with date and site. The sample is brought back to the lab and evenly distributed in a Caton subsampler, a gridded screen which is divided into 30 marked squares. A random number generator is used to select a square, and then the entire square is picked through, counting and identifying macroinvertebrates. Squares are randomly picked until 200 ($\pm 20\%$) macroinvertebrates are counted and identified. This is the minimum number of macroinvertebrates necessary for valid statistical analysis.



Watershed technicians wash a sample
Photo by Cobb County Water System Stream Monitoring

The state SOP that CCSM utilizes includes ecoregional scoring criteria and associated ecological condition categories. The Georgia AAS Assessment Protocol has one set of scoring criteria for the entire state to evaluate general water quality categories. For the state SOP, values for metrics describing taxa richness, abundance, and composition are calculated from genus and species level data to create an overall score, which is compared to an ecoregional reference score for a determination of ecological condition. For Georgia AAS, the presence or absence of aquatic taxa and their associated tolerance or sensitivity to pollution are used to calculate a water quality index value.

As you can see, both plans gather macroinvertebrate population, stream, and habitat quality data important to the state of Georgia. The AAS protocol is important because it connects volunteers with their watershed and gathers baseline data about streams. The number of volunteers sampling throughout the state greatly outnumbers those performing regulatory sampling. The State SOP, though more intensive, provides a detailed account of water quality and ecological condition. Both protocols provide important information about Georgia's streams.

Sources:

- Georgia Department of Natural Resources. 2000. Georgia Adopt-A-Stream: Biological and Chemical Monitoring. Atlanta, Georgia.
- Georgia Department of Natural Resources. 2007. Standard Operating Procedures for Freshwater Macroinvertebrate Biological Assessment. Atlanta, Georgia.

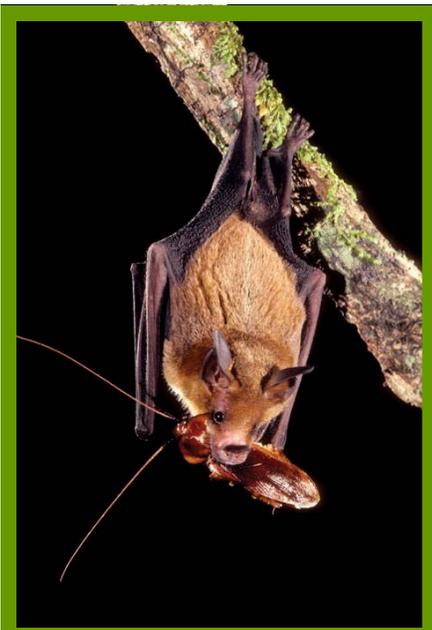
Biodiversity Spotlight: Bats

By Adam Sukenick, Cobb County Watershed Monitoring

Few things set the stage for a good scare better than the silhouette of a bat on a dimly lit night sky. Thoughts of bats feasting on blood then returning to perch, upside down, deep in the recesses of a dark cave may have your muscles tightening in suspense and make your skin feel alive but they've probably prevented you from understanding what bats are really like.

It's true - most bats sleep upside down hanging from cave ceilings or trees. This keeps them safe from predators and is quite practical for a flying mammal as it allows them to simply let go of their roost and drop into flight. Their toes, used to grasp their perch, are naturally clenched by a specialized tendon that allows them to hang upside down without expending energy. In fact, they must flex their muscles to let go and fly away!

The shadow of flapping wings and erratic flight spotted at dusk may not be graceful, but don't be fooled; that bat swooping through the night sky isn't heading for you and there's no chance of it ending up a tangled mess in your long hair. It's a misconception that bats cannot see or don't have eyes. Although most don't rely on sight, some have an excellent sense of sight and smell, which they use for locating ripe fruit to eat. In Georgia, however, all bats use echolocation to hunt prey and avoid obstacles during flight. By emitting high frequency calls from their nose or mouth during flight, bats use the deflected wavelengths to orient themselves, avoid predators and form pictures of prey or obstacles. This radar-like system makes them quite efficient flyers and hunters – even in the dark.



Bats help control insect populations in organic Mexican coffee plantations

Photo by Merlin D. Tuttle

All Georgia bats remain sheltered during the day in caves, hollow trees or foliage and emerge at night to hunt insects. Their prey is primarily taken during flight and consists of flying insects such as mosquitoes, moths and beetles; however, a new study on a Mexican coffee plantation shows that many bat species found there perch over cropland and zero in on stationary pests chewing on leaves. Once located, they swoop in to snatch the insects off the crops. In this respect, bats are considered to be very beneficial to farmers and offer an alternative to pesticide use. Bats are effective hunters with such a high metabolism that a single small insectivorous bat can eat thousands of mosquito sized insects each night. This offers the additional benefit of controlling biting insects such as mosquitoes, which can carry the West Nile Virus and other diseases. Research has demonstrated that bats are more effective than birds at controlling insect pests. In other parts of the world, bats that feed on fruits or nectar play important roles as pollinators and seed dispersal agents.

The image of blood sucking bats may seem far from normal behavior, however, around the world there are carnivorous bats that feed on frogs, fish, birds or rodents. In Latin America there are three species of vampire bats that feed on blood. They do so by biting the victim and licking blood from the wound. An anticoagulant keeps the wound from clotting. This anticoagulant has been synthesized and is used in medicine for heart patients. Although difficult to accept, even the few species of blood sucking bats in existence have proven they have something to offer.

Of course, we should remember that although some benefits exist, bats are still wild animals and do pose some threat if they're not properly respected. Bats are linked with many of the recent human rabies cases in the United States and rabies can be fatal if not treated. Recognizing the risk of exposure to the rabies virus and seeking medical attention is vital. Bites from bats are typically noticed immediately, but because bat

teeth are so small it is possible that bite marks are not easily detected. If a bat is found in the room of a small child or someone mentally impaired it is best to seek medical advice. Bats do sometimes roost in attics but will not typically occupy living spaces or be active during the day. Behavior contradictory to these routine habits should be considered suspicious. The only way to know if a bat has rabies is through laboratory testing which would require capturing the bat and this should not be attempted unless necessary. Simply seeing a bat will not expose you to rabies nor will touching a bat, bat guano (feces), or even blood.

There are 16 different bat species in Georgia and, like most native wildlife, they are protected by state law. Six Georgia bat species get special consideration due to threats on their populations. Three of these are protected under the Georgia Endangered Wildlife Act and two receive additional federal protection. Loss of habitat is the primary threat to bats. When displaced from nature bats are forced to seek alternative shelter such as attics. Although they hibernate in cooler places, bats, especially breeding communities, require warm temperatures. If bats are discovered in your attic it's best to wait for them to leave and seal the opening to prevent them from returning. One can also employ an exclusion device that allows the bats to leave but not reenter. Please seek advice when using an exclusion device and be aware that females give birth in the spring and young take up to 3 weeks before they are able to join the adults in flight. Exclusion devices should not be used if young bats are unable to leave the roost.

There is another threat to bat populations that deserves special attention. Bats have an almost insatiable appetite for flying insects. Many flying insects begin their life cycle in our streams and later emerge as flying adults. When stream habitat is destroyed and water quality degrades, our aquatic insect population declines. Less emerging adult insects mean fewer food sources for bat populations. The natural environment is incredibly complex and this series of relationships between humans, streams, insects and bats demonstrate just how intricately linked our resources are and how vital our role in preserving a balance must be.

The image of a spooky bat illuminated by the light of a full moon is best left to Hollywood filmmakers or displayed on a Halloween pumpkin. Bats in Georgia and around the world play beneficial roles in controlling insect populations and pose little threat to humans. Their shadowy presence lit by the setting sun need not instill fear in your heart. Respect them as the world's only flying mammal, welcome them to your yard and let them forage on the pesky flying insects that also appear at dusk.



Mexican free-tailed bats at dusk

Photo by Lynn McBride

Sources:

www.batcon.org

www.georgiawildlife.org

www.cdc.gov/rabies/bat.html

news.mongabay.com/2008/0404-bats.html

Cobb County Watershed Stewardship presents...

Bat Ecology Workshops

July 21, 2009 (classroom portion) & July 28, 2009 (field study)

Cobb County Water Quality Laboratory • 662 South Cobb Drive • Marietta, Ga 30060

Jackie Belwood, a bat biologist, will be leading a free workshop on these beneficial but misunderstood creatures. We hope you can join us for this all-ages appropriate event!

Please contact Vicki Culbreth at (770) 528-1482 or vicki.culbreth@cobbcounty.org to register.

Schedule of Events

Stormdrain Marking Day

Date: Saturday, May 9th
 Time: 9:00am - 12:00pm
 Location: Water Quality Lab
 Cost: Free
 Call: 770-528-8214

Monarchs Across Georgia Plant Sale

Date: Saturday, May 9th
 Time: 10:00am - 4:00 pm
 Cost: Free to attend
 Call: 404-388-8228
 Information:
 www.MonarchsAcrossGA.org

Etowah Watershed Presentation

Date: Thursday, May 7th
 Time: 7:00pm - 9:00 pm
 Location: Water Quality Lab
 Cost: Free
 Call: 706-202-2271

May 2009

www.epa.gov/owow/wetlands/awm/

American Wetlands Month



Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3 	4 Drinking Water Week May 3-9	5	6	7 	8 Etowah Watershed Presentation	9  Stormdrain Marking Day
10	11	12	13	14	15	16 National River Cleanup Day
17	18	19	20	21	22	23
24	25	26	27	28	29 	30 World Turtle Day
31						

Stormdrain Marking Event, May 9, 2009

Contrary to popular belief, the storm drains on our streets do not lead to a water treatment plant. They lead to nearby creeks and can carry substances such as fertilizers, pesticides, and pet waste that are washed from yards and streets. Litter, used motor oil, and antifreeze left on the landscape are also transported into the storm drains and find their way to our waterways. This not only spoils the beauty of our streams, but exposure to chemicals can be toxic to wildlife. Litter may also be mistaken as food by wildlife.

To inform citizens of this problem, aluminum markers with the words “No Dumping, Leads to Creek” are placed onto the surface of the storm drain. These markers are long-lasting and easy to apply. In a simple message, they inform the community that any item thrown down the storm drain, applied to the landscape, or dripped on pavement will wind up in a local stream.

Would you like to help improve water quality and have an impact in your community? As a volunteer in our stormdrain marking program, you will mark drains, clean up nearby litter, and inform your neighbors about the dangers of non-point source pollution. We encourage you to join our program and start doing your part to keep our county streams clean!

On May 9th at 9:00 am, we will be holding our first community-wide stormdrain marking event. There are many neighborhoods throughout Cobb County that have not been marked yet and are in need of some attention. As a team member, you will be sent out to mark a targeted area, collecting litter along the way. This is a great way to help your fellow Cobb County residents while meeting others with the same mission!

To participate marking project (or to coordinate your own project), contact Emily Toriani-Moura in the Cobb County Water Department at 770-528-8214 or by email at emily.toriani@cobbcounty.org.



American Rivers Month

www.americanrivers.org

June 2009

Schedule of Events

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
						River Rendezvous
21	22	23	24	25	26	27
Paddle Georgia June 20-26						
			National Pollinator Week			Great American Backyard Campout www.nwf.org/backyardcampout/
28	29	30				

Cool Waters

Date: June 10th - June 12th
 Time: 8:30 am - 4:00 pm
 Location: Big Creek Water Reclamation Facility
 Cost: \$30
 Call: 770-794-5227

River Rendezvous

Date: Saturday, June 20th
 Time: 10:00 am - 1:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-423-1058

Paddle Georgia

Date: June 20th - 26th
 Cost: varies
 Information: www.garivers.org/paddle_georgia/pghome/html

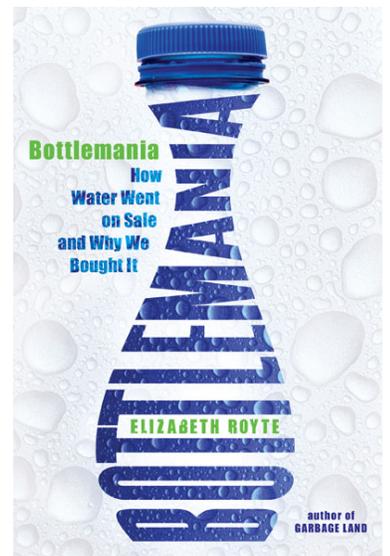
Recommended Reading

Bottlemania by Elizabeth Royte

An incisive, intrepid, and habit changing narrative investigation into the commercialization of our most basic human need: drinking water. Having already surpassed milk and beer, and second now only to soda, bottled water is on the verge of becoming the most popular beverage in the country. The brands have become so ubiquitous that we're hardly conscious that Poland Springs and Evian were once real springs, bubbling in remote corners of Maine and France. Only now, with the water industry trading in billions of dollars, we have begun to question what it is we're really drinking and why.

In this intelligent, eye-opening work of narrative journalism, Elizabeth Royte finds the people, machines, economies, and cultural trends that bring it from nature to our supermarkets. Along the way, she investigates the questions we must invariably answer. Who owns our water? What happens when a bottled-water company stakes a claim on your town's source? Should we have to pay for water? Is the stuff coming from the tap completely safe? And if so, how many chemicals are dumped in to make it potable? What's the environmental footprint of making, transporting, and disposing of all those plastic bottles?

- From the Publisher



This publication, like all those profiled in our Recommended Reading feature, is available for checkout from the Watershed Stewardship Library, housed in the Water Quality Laboratory.

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G. Woody Thompson, *District Four*
David Hankerson, *County Manager*



Cobb County...Expect the Best!



Monitoring Kit Swap Out

Summer is almost here and everyone is headed to the sunny outdoors, whether it be to the beach or just out to the backyard. Here at the Watershed Stewardship Program, it's the time of year when we inventory and clean our kits to make sure they are ready for another year of monitoring.

Our responsibility is to make sure that all our volunteers have the support and equipment they need to continue their data collection. The chemicals in our Shallow Water Kits do expire, which could affect the quality of your data. Age, exposure to summer heat and elements, and bacterial contamination may negatively impact your monitoring. To prevent this, we want to give all our volunteers fresh chemicals for the upcoming year.

We will be contacting you in June or July to schedule a time for your kit to be swapped. If you have any questions regarding this process, please call Vicki Culbreth at (770) 528-1482.

A Reminder To ALL Watershed Volunteers!

Because our program is driven by the dedication of our volunteers, we would like to recognize all of the hard working stewards who have dedicated their time to improving our local ecology. Each group will have their own page on our website to explain their history and goals. We hope this will be a way for our groups to connect with each other in the future.

To submit your group's information, please go to: www.cobbstreams.org and click on the **Volunteer Profile Form** at the bottom of the homepage.