the Thalweg

Watershed Stewardship Program

Winter 2015

Volume 12 Issue 1

Cobb County Watershed Stewardship Program

662 South Cobb Drive
Marietta, Georgia 30060

770.528.1482
water_rsvp@cobbcounty.org

www.cobbstreams.org

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Follow our boards on Pinterest for environmental education and stewardship resources.

You're Invited!

It's almost time for our annual Watershed Stewardship Fair! This event provides volunteers with the opportunity to showcase their water protection efforts and meet others who share the passion for keeping our waterways healthy. Last year, over forty people attended, with representatives from schools, families, environmental groups, and civic organizations.

This is your opportunity to learn from and support other Cobb County volunteers. Originally designed to exhibit Cobb's Adopt-A-Stream volunteers, we have expanded the event to include all of our watershed stewards, such as anuran monitors, storm drain markers, and cleanup groups. 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 and conservation efforts. Also, for those who wish, we give each watershed stewardship group a few minutes to relate success stories and share concerns and frustrations with a like-minded audience. To provide our volunteers with an opportunity to express their concerns to County, State, and Federal agencies as well as advocacy groups, we have again invited representatives from Adopt-A-Stream, Georgia Environmental Protection Division, Georgia River Network, Chattahoochee Riverkeeper, U.S. Environmental Protection Agency, National Park Service, and Cobb County Board of Commissioners.

During the event, we will also celebrate the accomplishments of our volunteers and partners by presenting several Watershed Stewardship awards. Last year, the School of the Year award was given to Pope High School. Ina Allison received the Volunteer of the Year award, and we presented the Kennesaw State University School of Art and Design with the Partner of the Year award.

In addition to a fun evening of education and networking, tours will be conducted for those who are interested in the day to day workings of the Cobb County Water Quality Laboratory. Join our chemists and biologists as they explain how the lab tests water from Cobb's four wastewater treatment plants to ensure that it is safe to release back into the environment. The tour is appropriate for all ages and backgrounds.

Join us on February 26th to tour the lab, meet fellow volunteers, and speak to environmental professionals. Refreshments will be provided. If you would like to attend the Watershed Stewardship Fair, contact us at 770-528-1482 or water_rsvp@cobbcounty.org. Please RSVP by February 10th. We hope to see you there!

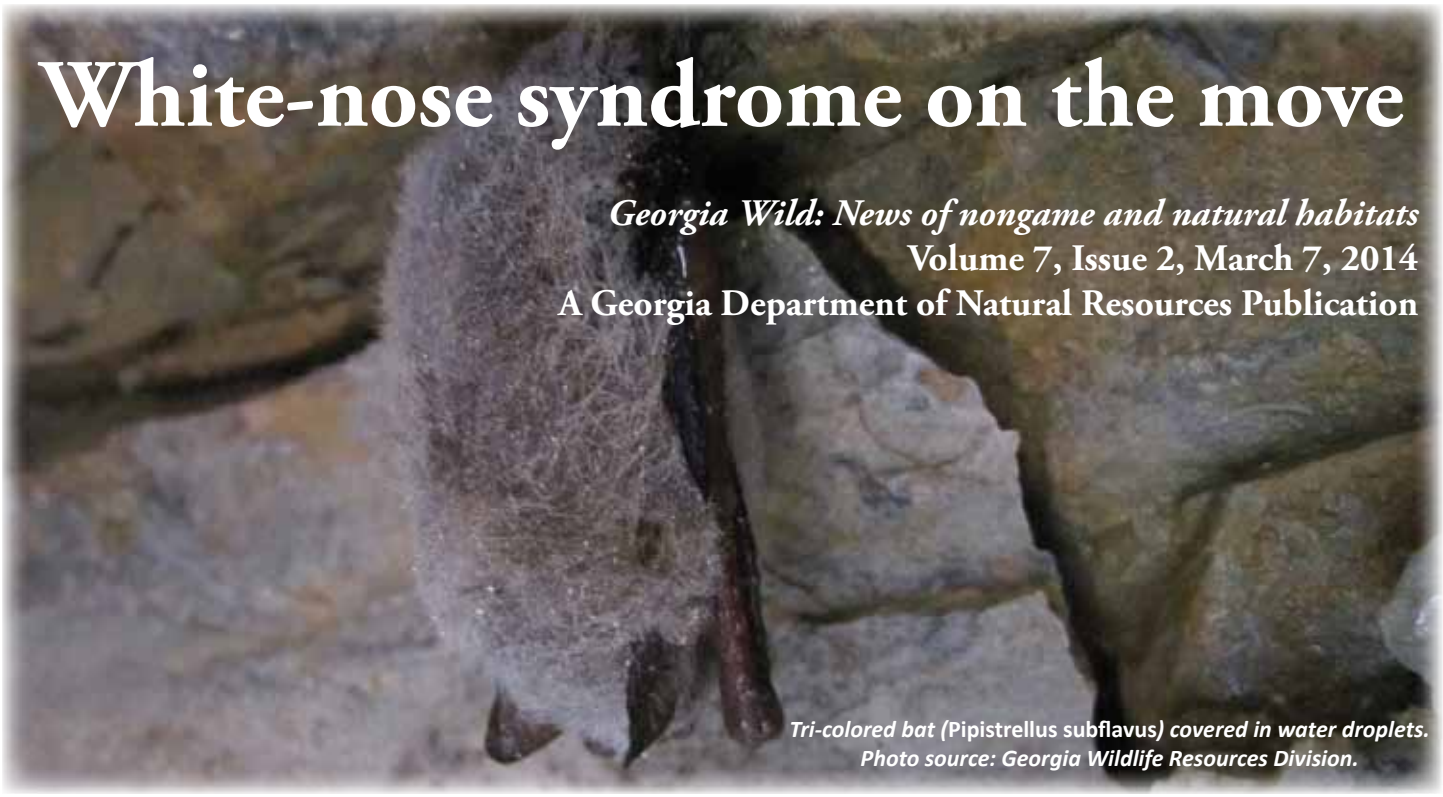
2015 Watershed Stewardship Fair

Thursday, February 26th
6:30 - 9:00 PM

Cobb County Water Quality Lab
662 South Cobb Drive
Marietta, Georgia 30060

White-nose syndrome on the move

Georgia Wild: News of nongame and natural habitats
Volume 7, Issue 2, March 7, 2014
A Georgia Department of Natural Resources Publication



*Tri-colored bat (*Pipistrellus subflavus*) covered in water droplets. Photo source: Georgia Wildlife Resources Division.*

Bat disease found farther south and east in the state
In early 2013, biologists documented white-nose syndrome for the first time in Georgia caves. Early this year (2014), DNR-led monitoring documented the disease deadly to bats in two more caves. Tri-colored bats checked late last month in Kingston Saltpeter Cave in Bartow County showed symptoms of white-nose, the farthest point south the disease has been recorded. Even more tragic: On March 4 (2014), a team led by DNR biologist Trina Morris found significant evidence of the disease in Rabun County at the state's largest known bat hibernacula.

The discovery at Black Diamond Tunnel, a private, semi-flooded shaft named for the railroad company that started but never finished it, marks the first time that white-nose has been found in northeast Georgia. Signs of the infection greeted the researchers: dead bats piled on ledges and floating in the water; live bats with muzzles coated in the signature fuzz clinging to the rock ceiling.

Morris and Jackie Jeffery of DNR's Nongame Conservation Section were teaming with biologists Pete Pattavina of the U.S. Fish and Wildlife Service and Nikki Castleberry of the Georgia Museum of Natural History for the yearly survey of Black Diamond. The tunnel usually provides wintering habitat for an average of 5,000 tri-colored bats, formerly called eastern pipistrelles. But the landowner contacted DNR just days before the survey, saying she had seen a bat flying out of the tunnel during the day, not uncommon when white-nose is affecting hibernating bats.

The survey confirmed the landowner's fears. Nearly 100 dead bats were observed. Also, in 2013, researchers counted 5,517 bats at Black Diamond. This year, they counted 3,472. According to Morris, the extreme cold this winter may be partly responsible for the sharp drop in numbers. But it's too soon to tell, she said. "It's going to take a long time to see what impact WNS has across the state." . . .

The discovery at Black Diamond wasn't a surprise, Morris said. White-nose has been found in southern Appalachian sites in North Carolina and Tennessee. Yet the signs of the impact were "scary," she said. Adding to the scare: Those signs seem reminiscent of how white-nose surged through Northeastern states, shredding bat populations.

Going underground to check the health of Georgia's bats, *Pete Pattavina*
As we begin planning our vegetable gardens, and our roadsides and front yards look like pincushions of daffodils, Georgia's hibernating bats still have a month of sleep, deep inside the state's fragile Georgia cave systems. But starting late February 2014, bat biologists and cavers led by DNR's Trina Morris went underground to check the health and population numbers of hibernating bats.

Documented in Georgia for the first time in February 2013, white-nose syndrome is a deadly fungal disease that has killed millions of bats as it spread at a break-neck pace through Canada and 26 U.S. states. The non-native fungus that causes white-nose likely originates from Europe and arrived as an unwelcome passenger in North America around 2005, where it quickly started to move from state to state.

Georgia's most common winter-hibernating bat species, the tri-colored bat, weighs about as much as a U.S. quarter. At such a small size, bats such as tri-coloreds need to remain in an uninterrupted sleep, or torpor, in caves to conserve energy until insects start to hatch again in the spring. White-nose syndrome irritates the bats' skin, causing them to wake too often, burning precious fat reserves. Diseased bats, in a desperate attempt to find food, may leave their cave too early, only to freeze outside during frigid winter temperatures.

As researchers race to find a cure, tracking the spread of white-nose syndrome and determining accurate population numbers of hibernating bats is paramount to understanding what the future holds for our native bat species.

Pete Pattavina is a biologist with the U.S. Fish and Wildlife Service office in Athens. See his article "Finding a killer: on the trail of white-nose syndrome," posted in April 2013: www.georgiawildlife.com/node/3300.

Raising awareness

DNR is working with cavers, cave owners and conservation groups to raise awareness about limiting trips into caves and following decontamination protocols for disinfecting clothes and gear, all part of the agency's white-nose response plan.

Please contact a DNR Wildlife Resources Division office or email GADNRBats@gadnr.org if you find dead or dying bats with fungus, or see bats flying outside during the day in winter months when they would usually be roosting or hibernating. Dead or dying bats with no signs of WNS should be reported to the local health department.

White-nose syndrome fungus (Geomyces destructans) *on tri-colored bat* (Pipistrellus subflavus)*. Photo by Pete Pattavina, U.S. Fish and Wildlife, www.Bugwood.org.*

On the Net

- Bat conservation in Georgia - www.georgiawildlife.com/Conservation/Bats
- State White-nose Syndrome Response Plan - www.georgiawildlife.com/WNSplan
- Video: Trina Morris discusses WNS - www.youtube.com/watch?v=ldsA1DSGV3M&list=UUWHViy7leTHF0kBuiT5cA_Q&index=1
- White-nose syndrome.org - www.whitenosesyndrome.org

To read the full article online, visit http://content.govdelivery.com/accounts/GADNR/bulletins/a97696.

State's first wild snake with SFD confirmed

The white-nose syndrome of snakes?

The head of the mud snake looks crusty and scarred, as if the animal has been burned. One eye is dull white. Scales along the snake's body are dry and sloughing off.

Snake Fungal Disease is not pretty - not for one snake, and possibly not for populations of them.

The disease which some scientists have compared to white-nose syndrome, killer of an estimated 5.7 million bats in the U.S., was documented in July 2014 in a wild snake in Georgia.

An emaciated mud snake found by an Orianne Society volunteer in Bulloch County tested positive for *Ophidiomyces ophiodiicola*, a fungus consistently associated with Snake Fungal Disease. That's the first free-ranging snake in Georgia the Southeastern Cooperative Wildlife Disease Study (http://vet.uga.edu/scwds) has confirmed with *Oo*.

First reported from a captive black rat snake in Sparta, this disease marked by severe dermatitis has turned up in growing numbers of wild snakes in the eastern and midwestern U.S. since 2006. The impact on wild populations is not clear. Yet, Snake Fungal Disease was implicated in a 50-percent decline in an imperiled population of timber rattlesnakes in New Hampshire.

Comparisons to white-nose are spurred by that potential, and by similarities between *Ophidiomyces ophiodiicola* and the white-nose fungus.

Wildlife biologist Dr. Jessica McGuire of DNR's Nongame Conservation Section said that when studying such diseases, "You opportunistically get what data you can, and focus from there."

Because mud snakes are so secretive, senior wildlife biologist John Jensen suggests the Georgia case could point to another troubling factor - the ease at which this disease spreads. "I guess the take-home message is that all of our snakes may be susceptible."

Learn more

- Georgia DNR Wildlife Resources Division - www.georgiawildlife.com/node/3699
- U.S. Geological Society National Wildlife Health Center - www.nwhc.usgs.gov/disease_information/other_diseases/snake_fungal_disease.jsp
- University of Illinois - http://news.illinois.edu/news/14/0715snake_fungus_MatthewAllender.html
- The Nature Conservancy blog - http://blog.nature.org/science/2013/06/11/snake-fungal-disease-the-white-nose-syndrome-for-reptiles

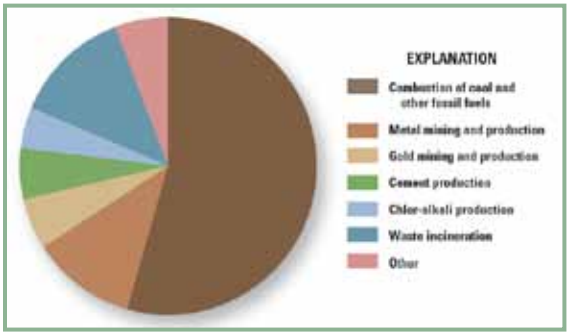
To read the full article online, visit http://content.govdelivery.com/accounts/GADNR/bulletins/cb5c69

The Quality of Our Nation's Waters: Mercury in the Nation's Streams - Levels, Trends, and Implications

By Dennis A. Wentz, Mark E. Brigham, Lia C. Chasar, Michelle A. Lutz, and David P. Krabbenhoft
Originally published October 14, 2014 by the U.S. Geological Survey

Mercury is a potent neurotoxin that accumulates in fish to levels of concern for human health and the health of fish-eating wildlife. Mercury contamination of fish is the primary reason for issuing fish consumption advisories, which exist in every State in the Nation. Much of the mercury originates from combustion of coal and can travel long distances in the atmosphere before being deposited. This can result in mercury contaminated fish in areas with no obvious source of mercury pollution.

Three key factors determine the level of mercury contamination in fish—the amount of **inorganic mercury** available to an **ecosystem**, the conversion of inorganic mercury to **methylmercury**, and the **bioaccumulation** of methylmercury through the **food web**. Inorganic mercury originates from both natural sources (such as volcanoes, geologic deposits of mercury, geothermal springs, and volatilization from the ocean) and anthropogenic sources (such as coal combustion, mining, and use of mercury in products and industrial processes). Humans have doubled the amount of inorganic mercury in the global atmosphere since pre-industrial times, with substantially greater increases occurring at locations closer to major urban areas.



Burning coal for energy production was the single largest component of anthropogenic mercury emissions in the United States during 2005, accounting for slightly more than one-half of the total.

In aquatic ecosystems, some inorganic mercury is converted to methylmercury, the form that ultimately accumulates in fish. The rate of mercury methylation, thus the amount of methylmercury produced, varies greatly in time and space, and depends on numerous environmental factors, including temperature and the amounts of oxygen, organic matter, and sulfate that are present.

Methylmercury enters aquatic food webs when it is taken up from water by algae and other microorganisms. Methylmercury concentrations increase with successively higher **trophic levels** in the food web—a process known as bioaccumulation. In general, fish at the top of the food web consume other fish and tend to accumulate the highest methylmercury concentrations.

This report summarizes selected **stream** studies conducted by the U.S. Geological Survey (USGS) since the late 1990s, while also drawing on scientific literature and datasets from other sources.

Major Findings

(1) Methylmercury concentrations in fish exceeded the U.S. Environmental Protection Agency criterion for the protection of human health at about one in four streams across the United States.

Fish methylmercury concentrations exceeded 0.3 ppm—the U.S. Environmental Protection Agency (USEPA) fish tissue mercury criterion for the protection of human health—in **predator** fish from about one-fourth of nearly 300 streams sampled in a nationwide survey. Methylmercury concentrations in largemouth bass—a common predator fish—exceeded the USEPA criterion at more than one-half of sites where they were collected. Similarly, recent national surveys by the USEPA found that methylmercury levels in fish exceeded the criterion from about one-fourth of stream kilometers assessed, and in predator fish from about one-half of lakes sampled.

Fish methylmercury concentrations in streams typically were highest in wetland dominated landscapes, particularly in coastal plain streams of the Southeastern United States. Fish methylmercury levels also were high in the Western United States, but only in streams that historically had been mined for mercury or gold. Methylmercury levels were low in fish from streams in major urban and agricultural areas.

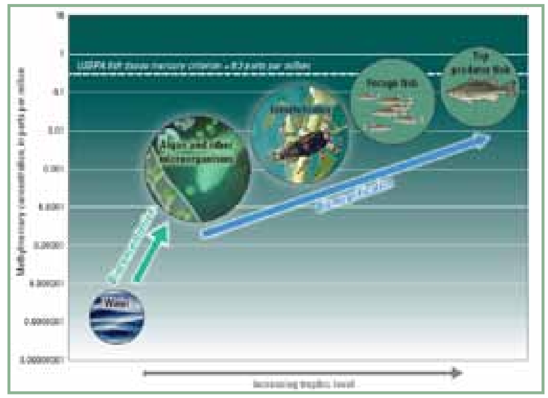
Fish consumption advisories based on high methylmercury concentrations exist in every State. These advisories are based on the USEPA's **reference dose** for mercury and States' fish monitoring data, and are issued by individual States and Tribes. It is important for people consuming locally caught fish to be aware of the fish consumption advisories that apply in their area.

(2) The abundance and characteristics of wetlands are key factors that affect the ability of stream ecosystems to transform mercury into methylmercury.

Methylmercury concentrations in stream water, fish, and other aquatic organisms, correlate strongly with wetland abundance in stream basins. Wetland characteristics, such as limited dissolved oxygen concentrations and abundant organic matter, provide favorable environments for microorganisms to convert inorganic mercury to methylmercury. Methylmercury production in wetlands and other aquatic ecosystems generally increases with increasing sulfate, which can be contributed by anthropogenic sources, such as emissions from coal burning. Thus, decreasing sulfate emissions, in response to implementation of the Clean Air Act, are expected to cause decreasing methylmercury concentrations in some areas of the United States.

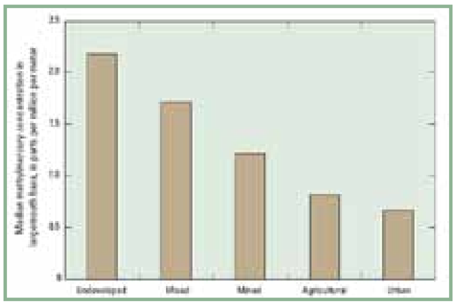
Water-level fluctuations, including drying and wetting of soil and aquatic sediment, also exacerbate mercury methylation. Fluctuating water levels can result from water-management actions, such as dam construction and operation. In addition, climate change is likely to increase the frequencies and intensities of droughts and storms, thus amplifying water-level fluctuations and increasing methylmercury concentrations.

(3) Methylmercury concentrations in fish depend more on the amount of methylmercury in an ecosystem than on the amount of inorganic mercury released to the ecosystem.
Methylmercury concentrations in fish correlate strongly with methylmercury concentrations in stream water, indicating that the amount of methylmercury available to the base of the food web is an important control on fish methylmercury concentrations. Fish near the top of a food web have higher methylmercury concentrations than fish at lower trophic levels, because with each increase in trophic level, the methylmercury in the **prey** organism is accumulated into the tissue of the **consumer**.



Methylmercury concentrations in aquatic organisms increase with increasing methylmercury concentrations in water and with increasing trophic level. Fish at the top of the food web tend to have the highest concentrations of methylmercury.

Across the United States, methylmercury concentrations in fish and stream water generally were highest in undeveloped areas with abundant wetlands, which provide ideal conditions for methylmercury production. In contrast, methylmercury levels in largemouth bass from urban streams were the lowest of all **land uses** and **land covers** studied. This occurred even though inorganic mercury inputs were higher in urban settings than in agricultural, undeveloped, or mixed land use/land cover settings. Methylmercury concentrations were lower than expected in urban streams because factors conducive to methylmercury production, such as the amount of wetlands and dissolved organic carbon, also generally are low in these ecosystems. These findings contrast starkly with those for many other contaminants in **rivers** and streams, which tend to be high in urban and agricultural areas.



Mercury concentrations in largemouth bass were lowest in streams draining urban areas.

Although methylmercury concentrations in fish from some mined basins were as high as anywhere in the Nation, with values up to 50 times the USEPA criterion for the protection of human health, most fish tissue mercury levels in mined basins were no higher than in rural undeveloped basins. Some streams draining mined basins in the West have concentrations of inorganic mercury in water and sediment that are hundreds-of-thousands of times greater than streams in unmined areas. However, a relatively small portion of the inorganic mercury typically is converted to methylmercury because wetlands and dissolved organic carbon generally are low in these ecosystems. The large amounts of mercury in mined ecosystems still contaminate fish decades after mining activity has ceased and, without costly remediation, will likely continue to contaminate fish into the future.

(4) Mercury concentrations in lake sediment, fish tissue, and precipitation have decreased in some areas during recent decades, coincident with legislation regulating discharges of contaminants to air and water.
Downward trends of mercury in lake sediment, fish, and precipitation coincide with implementation of the Clean Air Act (1970), the Clean Water Act (1972), and other legislation designed to limit pollutants to the environment. These measures address reductions in mercury use, controls on mercury emissions from waste incinerators, and incidental capture of mercury by controlling sulfur and **particulate** emissions from coal-fired power plants.
Lake Sediment.—From 1970 to 2000, downward trends of mercury in lake sediment cores, which record the history of mercury delivery to a lake, outnumbered upward trends by about a 2:1 ratio. Downward trends were most common in lakes in dense urban areas, and are consistent with controls on industrial discharges of mercury and a shift in coal combustion from residential and commercial heating to electrical power generation. The relative lack of decreasing mercury concentrations in reference lakes (less than 1.5 percent urban land) reflects stable or increasing global atmospheric mercury sources.
Fish Tissue.—During 1969–87, downward trends in fish methylmercury concentrations were measured at 20 of 22 sites outside the Southeastern United States. The numbers of upward and downward trends were about equal in the Southeast. Decreasing concentrations occurred primarily during the 1970s, followed by relatively stable concentrations during the 1980s. The rate of decrease ranged from 3 to 12 percent annually.
Precipitation.—**Total mercury** concentrations in precipitation at Mercury Deposition Network sites decreased in almost one-half of 49 sites monitored during 1996–2005, but showed no discernible change at the remaining sites. Decreases were particularly evident in the Northeast and are consistent with large reductions in mercury emissions—especially from medical and municipal incinerators—during this period.

To read the full report, visit http://dx.doi.org/10.3133/cir1395.

Wentz, D.A., Brigham, M.E., Chasar, L.C., Lutz, M.A., and Krabbenhoft, D.P., 2014, Mercury in the Nation's streams—Levels, trends, and implications: U.S. Geological Survey Circular 1395, 90 p., *http://dx.doi.org/10.3133/cir1395*.

Upland Chorus Frog (*Pseudacris feriarum*)

Not all frogs breed during the warmer months. From November through March, you may hear upland chorus frogs trying to attract mates. Their call sounds like a fingernail repeatedly running across the teeth of a comb. Despite the loud noise it makes, locating this tiny, well-camouflaged amphibian is difficult. Upland chorus frogs only reach ¾ - 1½ inches in length, and they are brown to gray in color, sometimes with a pinkish tinge. Although patterns vary greatly from striped to spotted, upland chorus frogs always have a light line along the upper lip and a dark stripe that extends from snout to groin, passing through the eye.

Linda May, Environmental Outreach Coordinator
Georgia DNR Wildlife Resources Division

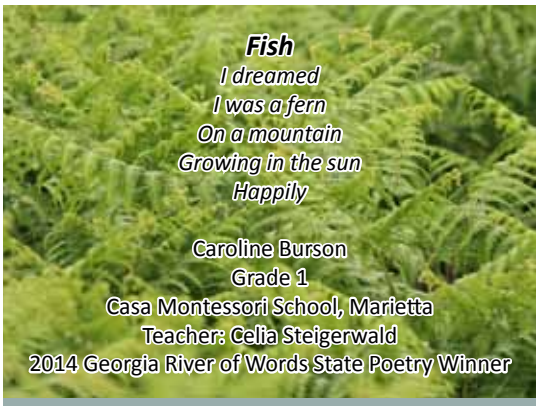
OBSERVATIONS

Stewardship Stars
Excellence in Data Collection

The following volunteers have submitted data each month during the September, October, and November quarter:

Bushart - Chemical Monitoring in the Sewell Mill Watershed
Butler Creek Kennesaw - Chemical & Bacterial Monitoring in the Butler Watershed
Crooked Branch - Bacterial Monitoring in the Chattahoochee Watershed
Dodgen Middle School - Biological Monitoring in the Sewell Mill Watershed
Fairfax Consulting - Chemical & Bacterial Monitoring in the Powder Springs Watershed
Friends of Mulberry Creek - Chemical Monitoring on Mulberry Creek
GA Lake Monitoring - Chemical Monitoring in the Etowah Watershed
Lakewood Colony - Chemical & Bacterial Monitoring in the Rubes Watershed
McClesky Middle School - Chemical, Biological, & Bacterial Monitoring in the Rubes Watershed
Pope High School - Chemical Monitoring on Piney Grove Creek
Richard's Creek - Chemical Monitoring in the Allatoona Watershed
Ridgecrest Dr @ NE Butler Creek Tributary - Visual Monitoring in the Butler & Proctor Watersheds
Sharon & Rick Donato - Anuran Monitoring in the Rubes Watershed
Sierra Club Cobb Centennial Group - Chemical, Biological, & Bacterial Monitoring in the Rottenwood Watershed
Village North Highlands Subdivision - Chemical & Bacterial Monitoring in the Willeo Watershed

Thank you for your hard work and dedication!



Fish
I dreamed
I was a fern
On a mountain
Growing in the sun
Happily

Caroline Burson
Grade 1
Casa Montessori School, Marietta
Teacher: Celia Steigerwald
2014 Georgia River of Words State Poetry Winner

welcome

Bells
Chemical & Bacterial Monitoring on Nickajack Creek

Green Family Homeschool
Chemical Monitoring in the Sewell Mill Watershed

Find us on Facebook

We post twice weekly updates, workshop information, natural history tidbits, and more!

Follow our boards on Pinterest for environmental education and stewardship resources.

ANNOUNCEMENTS

Welcome to the 2014-15 Chattahoochee Challenge Competitors!

Campbell Middle School Outdoor Adventure Club
Cheatham Hill 4th Grade Target Class
David Gomez
James Carreno
Jugu Dannie Sundar
Mabry Middle School Environmental Club
Olivia Akinsunmoye
Pope High School Environmental Club
Sentinel Lake subdivision
South Cobb High School Environmental Club
Zuri Bryant

The Chattahoochee Challenge is a volunteer competition created by the Watershed Stewardship Program to promote the participation in and organization of waterway related service projects. At the end of the contest, the individuals or groups that have accumulated the most volunteer service hours will win a free rafting trip on the Chattahoochee River with a park ranger from the National Park Service! Plus, the watershed, and ultimately the Chattahoochee River, will be cleaner and healthier.

Best of luck to our competitors!

So far, we have offered two events as part of the Challenge. At the November 1st Storm Drain Marking event, 13 participants marked 25 storm drains and distributed educational materials to 175 houses in the Olley Creek watershed. On December 13th, 43 volunteers attended a privet pull at Heritage Park in Mableton to remove privet, a non-native, invasive plant, from the landscape around Nickajack Creek. Thank you for your service!

Check our calendar for Spring 2015 volunteer events being offered by the Watershed Stewardship Program.

ECOPEDIA

Diapause

Diapause is a state of arrested development of an organism. It is usually the result of environmental factors. For example, the larvae of the blowfly *Lucilia sericata* enter a state of diapause as day-length shortens and temperature falls. After they have completed their feeding the larvae fall to the ground and, rather than pupate, they burrow into the ground. They spend the winter in the soil as larvae and only return to the soil surface and pupate in the spring.

www. amentsoc.org

CONSERVATION TIP

Landscape Netting

Landscape netting used for turf reinforcement, plantings, and erosion control can trap birds, small animals, and the predators that pursue them. Areas that are netted should be frequently checked and should use degradable netting products that break down faster than standard plastic ground covers. Another easy material to use in soil stabilization is a loose layer of broadcasted organic material, such as wood mulch. It is unlikely to entangle wildlife because it does not contain any type of mesh or woven layers.

Eastern kingsnake entangled in plastic landscape netting.

www.birdmonitors.net

ANNOUNCEMENTS

Farewell to Cheryl

Cheryl Ashley-Serafine joined the Watershed Stewardship Program in August 2012 as a puppeteer for our "Brooke and Branch" third grade puppet show. Since then, she has brought environmental education programming to approximately 15,000 students. As a retired Cobb County school teacher and a volunteer Adopt-A-Stream monitor for five years prior to her joining the team, Cheryl has been a tremendous asset to our program. She is an outstanding educator, and all of us have learned from her and grown as educators by working with her.

Cheryl has plans to travel the world, concentrate on her quilting business, volunteer with various environmental organizations, and spend time with her grandsons. While she will certainly stay busy, there's no doubt that she will always find time for bird watching.

Please join us in wishing Cheryl the best and
good luck with the many adventures yet to come!

Welcome Penny

Penny Costanzo will start in January as a "Brooke and Branch" puppeteer. Penny has been an environmental educator and professional actress for over thirty years. She has a Masters of Education degree and has taught at the Harvard University Zoology Museum and for Young Audiences, an arts in education program. She is currently a teacher and naturalist at the Chattahoochee Nature Center and looks forward to joining the Watershed Stewardship team.

SEASONAL HAPPENINGS

Homeschool Wintertime Science Series

This winter, the Watershed Stewardship Program will once again offer a science series for local home school students, ages upper elementary through high school. Mark your calendars!

Session One: Basic Stream Ecology
Tuesday, January 13, 2015 • 10am - 12pm
This class will provide information about stream habitats, how to assess stream health, and ways to protect your watershed.

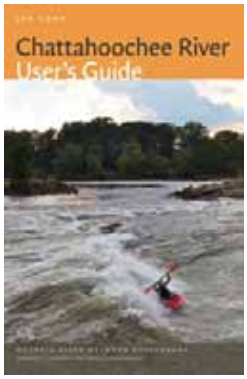
Session Two: Benthic Macroinvertebrates
Tuesday, February 17, 2015 • 10am - 12pm
In this class, you will learn how to identify aquatic macroinvertebrates and how to use them as indicators for water quality and stream health.

Registration is required. Space is limited.
Contact: water_rsvp@cobbcounty.org or 770-528-1482

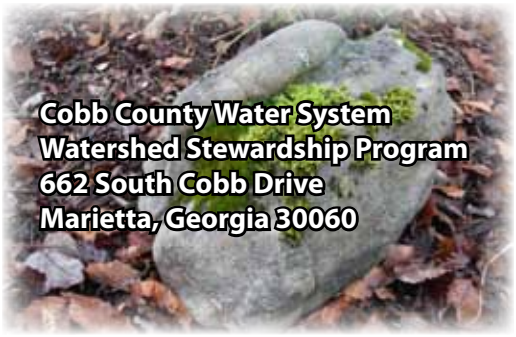
RECOMMENDED RESOURCES

Chattahoochee River User's Guide and **Etowah River User's Guide**
By Joe Cook

The Georgia River Network guides provide many little-known facts about Georgia's rivers, bring to life these rivers' cultural and natural history, and present river issues in an immersive and engaging manner that will inspire users to help protect their local waterways. The **Chattahoochee River User's Guide** traces the 430-mile course of the Hooch from its headwaters at a spring on Coon Den Ridge near Jacks Knob in northeastern Georgia to its confluence with the Flint River, where they form the Apalachicola River. From its headwaters on the southern slope of the Tennessee Valley divide near Dahlonega to its confluence with the Oostanaula to form the Coosa in Rome, the Etowah is a river full of interesting surprises. The **Etowah River User's Guide** offers all the information needed for even novice paddlers to feel comfortable jumping in a boat and heading downstream. Each guide features color photographs; maps that reveal the towns, roads, entry points, bridges, public lands, parks, and other landmarks along the river's course; put in/take out and optimal river flow information; mile-by-mile points of interest; a primer on fishing; and an illustrated natural history guide to help identify animals and plants commonly seen in and around the river.



University of Georgia Press



Cobb County Water System
Watershed Stewardship Program
662 South Cobb Drive
Marietta, Georgia 30060

Cobb County...Expect the Best!

This is an official publication of the Cobb County Water System, an agency of the Cobb County Board of Commissioners.

Calendar of Events

January

8 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
13 Homeschool Winter Science Series • Basic Stream Ecology • 10:00am - 12:00pm • Cobb County Water Quality Laboratory
15 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
22 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
29 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory

February

5 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
5-7 Georgia Science Teachers Association Conference • Macon, Georgia • www.georgiascienceteacher.org
7 Adopt-A-Stream Macroinvertebrate Monitoring Workshop • 9:00am - 3:00pm • Cobb County Water Quality Laboratory
12 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
14 Privet Pull on Nickajack Creek • 10:00am - 12:00pm • Heritage Park
17 Homeschool Winter Science Series • Benthic Macroinvertebrates • 10:00am - 12:00pm • Cobb County Water Quality Laboratory
19 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
20-21 Georgia Organics Conference & Expo • Athens, Georgia • www.georgiaorganics.org
26 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
26 Watershed Stewardship Fair • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory

March

5 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
10 Adopt-A-Stream Chemical Monitoring Workshop • 6:00pm - 9:00pm • Cobb County Water Quality Laboratory
12 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
14 Adopt-A-Stream Confluence • Gwinnett Environmental & Heritage Center • Buford, Georgia • www.georgiaadoptastream.org
19 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
20-21 Environmental Education Alliance of Georgia Conference • Rock Eagle 4-H Center • Eatonton, Georgia • www.eealliance.org
21-28 Atlanta Science Festival • Atlanta, Georgia • www.atlantasciencefestival.org
26 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
28 Storm Drain Marking in East Cobb • 9:00am - 12:00pm • Cobb County Water Quality Laboratory

Events in GREEN are Cobb County Watershed Stewardship events.
More information can be found on our Calendar at www.cobbstreams.org.