

the Thalweg

Watershed Stewardship Program

Volume 15, Issue 1

Cobb County Board of Commissioners

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Winter 2018

Photo Credit: Erik Larson, 2014, <https://tinyurl.com/yd5qhzbg>

Third Grade's Brooke and Branch Puppet Show

The Watershed Stewardship Program's Brooke and Branch Puppet Show is an award-winning free puppet show offered to 3rd graders in Cobb County and the City of Marietta schools. The hour long, whole grade assembly follows Brooke, a 3rd grader, on an adventure at her local stream habitat. Along the way, she meets new friends like Sal the Salamander, Branch the Musclewood Tree, Mother Nature, three Surfer Dudes, and Banded Water Snakes. During her adventure, a variety of ecological topics are introduced and discussed including aquatic habitats, biodiversity, animal adaptations, and the effects of pollution to the plants and animals in her stream.



The program begins with a 10-minute introduction to the puppet show which presents an overview of what the students will be learning. The 30-minute puppet show is then presented and followed by an interactive review of the topics that were covered. This time includes a chance for students to ask science and water questions about the topics they just learned, or questions they thought of during the program.



During the review portion of the program, students are given the opportunity to answer questions about what they learned while watching the puppet show. New vocabulary words, such as Storm Drains, Weathering, and Erosion are reinforced through large signs, enabling students to also see the vocabulary they are being taught. Additional topics are further discussed and explained to solidify student's comprehension. Throughout each part of the program, third grade Georgia Performance Standards are covered.

From November through March of the 2016-17 school year, the Brooke and Branch Puppet Show was presented in 56 schools to over 6,900 students. For the 2017-18 school year, the puppet show is scheduled to increase the number of schools participating and the number of students reached.

Wild Romance: Unusual Animal Courtship and Mating Rituals

In the game of life, survival is only part of the battle, one must also succeed in attracting a suitable mate. Similar to humans, animals use a broad range of strategies to advertise themselves in the mating market. Many species employ visual and auditory features as part of their elaborate courtship displays. In some instances, visual cues highlight an attractive feature, such as the colorful tailfeathers of a male peacock. Auditory courtship, such as those displayed by birds and frogs, are common across many types of animals. Specific behaviors are also part of the signaling repertoire and might include fighting, dancing, applying "make-up", or creating art. In some instances, courtship displays take place within a communal space, while other displays are private.

Prairie Vole

Although most rodents have a reputation for promiscuity, prairie voles break the trend, generally forming monogamous pair bonds that occasionally last a lifetime. In fact, the prairie vole is typically cited as an animal model for monogamy in humans. They huddle and groom each other, share nesting and pup-raising responsibilities, and generally show a high level of supportive behavior. If a male vole shows even the slightest hint that he's not going to stick around once babies are born, the female will grab him by the scruff of the neck, reports Smithsonian. If a member of either sex approaches the happy couple, they will chase him or her away.



Photo Credit: <https://tinyurl.com/ydhhb4bu>



Photo Credit: <https://tinyurl.com/ya7j7mfn>

Nursery Web Spiders

Male nursery web spiders typically present females with silk-wrapped gifts before mating. Males that attempt to court females without such a gift are more likely to end up as lunch themselves. The quality of the gift is also taken into account, occasionally males who do bring gifts are eaten as well. Once the parcel is presented, the female inspects it, if she accepts, he mates with her while she unwraps and eats the meal. Sometimes though, the male lies. If he gets hungry before presenting the gift, he will suck out the food and present a beautifully wrapped exoskeleton. Occasionally he will present a wrapped twig, hoping to trick the female. While the female might be fooled initially by the pretty wrapping, once she unwraps the package and does not find a meal, she ends the relationship immediately.



Photo Credit: <https://tinyurl.com/y85e9wv4>

Bluegills

Bluegills are colony spawners, meaning they excavate saucer-shaped nests, usually in a group, which resembles similar size craters. Male bluegills are divided into two types. The first, called "parental males", grow to a large size before maturing. These larger bluegills will dominate nests within a spawning colony, guarding the eggs a female has laid from other approaching, aggressive males. The second type of male bluegill is known as a "sneaker" male. These smaller, weaker males will wait on the outskirts and dart past the larger male to fertilize the eggs before the parental male is able to catch it. Some sneaker males even mimic female's coloration patterns in order to get past the larger males to fertilize the eggs.



Photo Credit: <https://tinyurl.com/ycudsrgz>

Adelie Penguins

Between September and October, Adelie males arrive at the breeding colonies before the females. The males begin to gather stones with their beak, which they form into a small mound as a nest for the females. Some males attempt to take stones from other nests, which often results in fights, chases, and beak attacks. Once the females arrive, they chose their mate based on the rocks presented by the males. If she likes the rock, she will choose that male as her mate. If not, she will continue looking for a mate. Once eggs are laid, both parents take turns incubating the eggs, as well as taking care of and defending their offspring while they grow.

Hooded Seal

The hooded seal is found in deep waters in the far north Atlantic Ocean and get their name from the distinctive inflatable like "hood" as sported by males on their foreheads, which they blow up like a balloon when they are excited. The adult male's hood is an enlargement of the nasal cavity which starts to develop when the male is about 4 years old. When inflated, the hood forms a high cushion on the head, up to twice the size of a football, while it hangs down in front of the upper lip when not inflated. The male hooded seal also has an inflatable nasal membrane which it can blow through one nostril like a red balloon and which makes a pinging sound when shaken. The hood and membrane are used for attracting females' attention and to display hostility towards other males during the breeding season.



Photo Source: <https://tinyurl.com/y8bjecmh>

Bowerbirds

Male bowerbirds are famous for creating complicated bowers that are used for display during the mating ritual. Each species of bowerbird constructs a specific form of bower, with decorating special to the individual male and his available resources. A male may spend a week to two months



Photo Credit:
<https://tinyurl.com/ycrvwc7e>

on constructing a new bower or refurbishing a previously used one. There are three main types of bower architecture: a cleared area containing an "avenue" or domed tunnel of sticks, just wide enough for a bowerbird to pass through and sometimes painted with vegetable juices; a "display court" with large leaves laid upside down or tiled with rocks; and a "maypole," which uses a sapling as a central tower, with an assortment of vegetation packed around the base, with or without a roof, sometimes many feet tall. Once the bower is built, the male then decorates it with anything he can find and carry, both natural objects such as seeds, berries, and flowers, as well as items discarded by humans. Different species of bowerbirds decorate their bowers with different colors. For example, the striped gardener bowerbird prefers yellow, red, and blue objects, while the fawn-breasted bowerbird favors green. After completion, a female bowerbird is attracted by the architecture of the bower and entertained by the male singing and dancing before deeming the male worthy of becoming a mate.



Photo Credit: <https://tinyurl.com/y85rbwkw>

White-Spotted Pufferfish

White-spotted pufferfish live in a monochrome, underwater world. It is hard to be noticed with their dull colors, making them practically invisible to those around them. In order to attract a female, male white-spotted pufferfish create intricately designed "crop circles" in the sand on the ocean floor. The male fish is only about 5 inches long, but the formation he builds measure about 7 feet in diameter. Formations are built by the male fish using his body to create peaks and valleys in the sandy bottom around a central circle of smooth sand. He completes these peaks and valleys by swimming in a straight line toward the center of the circle, then back around the center in a circular motion. Before the female arrives, the male forms irregular patterns in the fine sand particles of the central circle. He also decorates the peaks of the outer portion with shell and coral fragments. When a potential female partner arrives on the scene, the male stirs up the fine sand in the nest's inner circle. If she deems the nest, and the male who built it, satisfactory, she lays her eggs in the center of the nest and leaves. The male fish fertilizes the eggs externally and remains with the eggs for another six days, perhaps to guard the eggs. During the time until the eggs hatch, the ridges and grooves in the design prevent ocean currents from disturbing the eggs.



Photo Credit: Kimiaki Ito,

Sources:

- <https://blog.nature.org/science/2016/02/09/ten-strange-endearing-and-alarming-mating-habits-of-the-animal-world/> <https://tinyurl.com/ydh7ruer>
- <http://www.sciencemag.org/news/2016/05/gruesome-wedding-gifts-keep-male-spiders-being-eaten>
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- <https://www.livescience.com/40132-underwater-mystery-circles.html>

Cobb's 11th River Rendezvous on Rottenwood Creek

River Rendezvous is here again! River Rendezvous is a one-day water quality sampling event conducted throughout the Rottenwood Creek Watershed. This event is sponsored by Cobb County Water System's Watershed Stewardship Program and is planned with Sierra Club Centennial Group and Georgia Adopt-A-Stream. Cobb County WSP will be hosting our 11th monitoring event on April 14, 2018. Our goal is for seven teams to collect data at 24 sites in this watershed-wide sampling event.

Rottenwood Creek winds through Cobb County for six miles before entering the Chattahoochee River in the Chattahoochee River National Recreation Area. At its headwaters, near downtown Marietta, Rottenwood Creek is a small flowing stream, but near the confluence with the Chattahoochee River it is around 40' wide and 4-5' deep.



River Rendezvous helps to provide a snapshot of water quality throughout the entire watershed. The data generated from this event is used to evaluate the current state of the watershed, to educate community members, and to identify stream impairments typically found in an urban setting. As with previous events, all problems are subsequently reported to the appropriate agency (County and/or City of Marietta), typically to Cobb's Stormwater, Environmental Compliance, or Code Enforcement staff for follow-up, mitigating further environmental damage and helping to improve water quality in Rottenwood Creek and the Chattahoochee River.

As a volunteer, River Rendezvous will begin at the Water Quality Lab for orientation and meeting the rest of the participants. To ensure proper and representative data collection, event volunteers will be divided into sampling groups and led by a certified Georgia Adopt-A-Stream Chemical Monitoring Volunteer. After traveling to their assigned locations, groups collect samples (providing data on air and water temperature, dissolved oxygen, pH, solids, bacteria, conductivity, chlorides, nutrients, and metals), photo document the site, pick up litter, and conduct a habitat assessment. Each group will complete these assessments at three sites in the Rottenwood Creek Watershed, all located near the Water Quality Lab. Volunteers are provided with test kits, sample bottles, maps, trash bags for site cleanup, and a camera to document their work.





The measurements taken during River Rendezvous are all critical factors in helping to determine the health of streams and waterways. Water and air temperature effect the rate of biological and chemical processes, all aquatic organisms have set temperature ranges for their optimal health. For fish, the reproductive stages are the most sensitive to changes in temperature. Temperature also effects the oxygen levels in the water, metabolic rates of aquatic organisms, and the sensitivity of organisms to toxins in the water. Like us, aquatic organisms need oxygen for respiration, which is obtained through the oxygen dissolved in the water. Dissolved oxygen can be impacted by temperature, decaying organic material, or pollutants in the water. Testing pH measures the waters acidity. Changes in pH can affect egg hatchings, kill aquatic organisms and sources of food, or make the water completely uninhabitable for aquatic life. Conductivity is the measure of the water's ability to pass an electrical current and can help detect various pollutant discharges in the stream. It indicates the presence of inorganic dissolved solids and is also naturally effected by the geology of the area where the water flows.

The River Rendezvous is a fun event for all ages. It is a great way to become more familiar with a watershed and help the community at large. We encourage

you to join us in monitoring local waterways near your home and consider participating in this year's River Rendezvous event. If you are interested in participating in our River Rendezvous, contact Taylor Dove at taylor.dove@cobbcounty.org.

Snail Love Darts

Some species of snail, which have both male and female organs, stab each other with a calcium carbonate "love dart" that may be more than 1 centimeter long. It penetrates the sole of the foot, the head, or even the brain of the loved one. Ever since it was discovered in the 17th century, scientists had been at a loss to explain this bizarre practice. But 3 years ago, researchers discovered that the mucus covering the dart contains substances that cause contractions near the recipient's bursa copulatrix, an organ that normally digests the vast majority of received sperm. With this antisperm device incapacitated, they reasoned, more sperm could find their way to eggs.

Menno Schilthuizen

*American Association for the Advancement of Science, July 2001,
<https://tinyurl.com/y9da8fgx>*

OBSERVATIONS



*The snail at left points a sharp love dart at its mate.
Source: <https://tinyurl.com/y9d8nden>*

CONSERVATION TIP

Green Your Valentine Day

Valentine's Day is right around the corner. What can you get someone for Valentine's Day that is "green" and eco-friendly? Tons of things! It's definitely possible to participate in Valentine's Day traditions without buying completely into the commercialism.

- You can adopt a wild animal online. This makes the perfect gift for just about any occasion for your animal-loving eco-friendly friends or family.
- For those who have a favorite charity, and who truly care about donating and helping that charity, making a donation can be the ideal gift.
- Plant a tree together.
- If you're not sure what to get your significant other, making something from recycled materials is a good way to stay green.
- Instead of spending a ton of money on a brand-new, not-so-eco-friendly piece of jewelry at the store, try purchasing something vintage.
- Write a handwritten letter or poem on the back of an old photograph — a new one that you have taken or on an art piece — to express your feelings rather than purchasing a premade card.

Source: <https://tinyurl.com/y8yp6moh>

Stewardship Stars Excellence in Data Collection

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

Connie Ghosh - Chemical, Bacterial, and Macro Monitoring in the Rubes Watershed
Donna Leavell - Chemical Monitoring in the Olley Creek Watershed
ERM Atlanta - Chemical Monitoring in the Chattahoochee Watershed
Eddie's Follies - Habitat Survey Monitoring on Sweetwater Creek
Joe Lukas - Chemical and Bacterial Monitoring in the Nickajack Watershed
Judy Kelley - Chemical Monitoring in the Noses Watershed
Keiler - Chemical Monitoring in the Allatoona Watershed
Lakewood Colony - Chemical and Bacterial Monitoring in the Rubes Watershed
Lassiter High School APES Classes - Chemical and Bacterial Monitoring in the Rubes Watershed
Nancy Payne - Chemical and Bacterial Monitoring in the Noses Watershed
Pope High School Environmental Science Classes - Chemical Monitoring in the Sewell Mill Watershed
Richard's Creek - Chemical Monitoring in the Allatoona Watershed
Rosco - Bacterial Monitoring on Rottenwood Creek
Sierra Club Centennial Group - Chemical, Bacterial Macro Monitoring in the Rottenwood Watershed
Simon Locke - Chemical and Bacterial Monitoring on Butler Creek
SG5 - Chemical Monitoring in the Nickajack Watershed
Team Salty - Chemical Monitoring in the Sope Watershed
The Ochala Family - Chemical and Bacterial Monitoring on Noses Creek
Varner - Chemical Monitoring in the Noonday Watershed
Village N. Highland Subdivision - Chemical, Bacterial, and Macro Monitoring in the Willeo Watershed
Walton High School APES Classes - Chemical Monitoring on Sope Creek

Thank you for your hard work and dedication!



Photo credit: <http://tinyurl.com/y7p4sc7k>

2016 Georgia River of Words POETRY Winner

Jack Goggin

Grade 6

The Walker School, Marietta

Teacher: Mary Ann Stillerman

w e l c o m e

Dew Place

Chemical and Bacterial Monitoring in the Ward Creek Watershed

Cobb Progressives - Earth First

Chemical and Bacterial Monitoring in the Noses, Noonday, Proctor, and Lake Acworth Watersheds

East Cobb

Chemical and Bacterial Monitoring in the Sewell Mill Watershed

SEASONAL HAPPENINGS

Homeschool Winter Science Series: Reptiles and Amphibians

January 26 • 10:00am – 12:00pm • Snakes of Cobb County

Georgia is home to more than 40 species of snakes and Cobb County has its fair share. While some people fear them and some are fascinated by them, everyone can, and should, learn more about them! How have snakes adapted to survive in their environment? Which species in Georgia are venomous and how can you tell? Most importantly, how do snakes benefit our ecosystem? Come participate in a slide show and a lab-style activity about snakes and their adaptations. Appropriate for ages 8 and up.



February 27 • 11:00am – 12:30pm • Frogs of Cobb County

Georgia has about 30 species of frogs and nearly half of those can be found in Cobb County. This program focuses on local species and how you can identify which species are calling in your neighborhood. Participants will learn how to identify 13 species by call. Listening for frog species is fun and can be useful too! Participants are welcome to join our Frog Monitoring Program by simply letting us know what frogs you are hearing. Come learn about our local frogs, including what they can tell us about our environment. Appropriate for ages 8 and up.



March 13 • 4:30pm – 6:30pm • Storm Drain Marking Stewardship Mob

Each pair of volunteers will have a bucket full of supplies: maps, pens, storm drain markers, adhesive, educational material packets, and trash bags. Teams will mark the storm drains, pick up litter, and distribute packets to each home to educate them on the newly marked storm drains. Families are welcome.

March 15 • 7:00pm – 9:00pm • Frog Monitoring Workshop

Learn how to recognize our local frogs by listening to their distinctive calls. Cobb County frog data collectors are called Ribbits and pledge to listen to the frogs and toads and submit their data to us. Ribbits will receive a guidebook, a frog calls cheat sheet, a Cobb County frogs bookmark, and a CD with calls of our local species. Minimum age: 10. Wear sturdy shoes that can get damp and bring a flashlight or headlamp.

Save the Date! 2018 Watershed Stewardship Fair

Wednesday, March 28, 2018

6:30 - 8:30 PM

Cobb County Water Quality Lab

662 South Cobb Drive, Marietta, Georgia 30060

Please join us on Wednesday, March 28th, 2018 for our annual Watershed Stewardship Fair! This event provides volunteers with the opportunity to showcase their water protection efforts and meet others who share their passion for keeping our waterways healthy.

Participants are encouraged to share their stream observations and project goals with the community, and each group is invited to create a poster displaying their water quality conservation efforts. For those who wish, we give each group a few minutes to relate success stories and share concerns and frustrations with a like-minded audience. We will also celebrate the accomplishments of our volunteers and partners by presenting several Watershed Stewardship awards. In addition to a fun evening of education and mingling, tours will be conducted for those who are interested in the day-to-day workings of the Cobb County Water Quality Laboratory. This is your opportunity to learn from and support other Cobb County volunteers! Refreshments will be provided.

Please contact us at 770-528-1482 or water_rsvp@cobbcounty.org for more information or RSVP at <https://www.eventbrite.com/e/2018-watershed-stewardship-fair-tickets-30312104320>

Welcome to the 2017-18 Chattahoochee Challenge Competitors!

Kennesaw Mountain High School AP Environmental Science

Osborne High School Science Olympiad

Walton High School STEM Creek Project

We are excited to announce the schools and clubs that are registered in our 2017-18 *Chattahoochee Challenge*. These groups are participating in numerous volunteer opportunities, including creek cleanups, storm drain marking projects, privet pulls, and water quality monitoring. They are also coordinating their own activities that teach others about water quality and help protect Cobb County waterways.

Participating groups log and submit their event description, volunteer hours, and group participants. The group that accumulates the most volunteer service hours by April 30th, will win a free rafting trip on the Chattahoochee River with a National Park Ranger.

Best of luck to all our competitors!



ECOPEDIA

Brumation

Brumation can be loosely compared to hibernation among mammals. When a reptile brumates, it becomes lethargic, sometimes not moving at all for the duration of the cold season. In nature, these animals typically find hibernaculums within their environment in which they can be somewhat insulated. A hibernaculum is simply the place where the reptile spends these periods of inclement weather. Burrows, rock crevices, caves and leaf litter are a few examples of hibernaculums documented in nature. Some reptile species even brumate under water! On warmer days in late fall, early spring, or even during winters, brumating snakes sometime come out of their dens to bask in the sunshine. Nice sunny days that follow a long cold snap are often when people are surprised to see snakes. Just like humans, snakes head out to enjoy the sun and unsuspecting hikers can startle them.

<https://tinyurl.com/ybn67qp5>
<https://tinyurl.com/yav6hybr>

RECOMMENDED RESOURCES

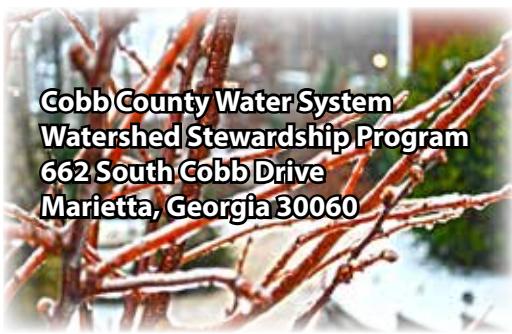
The Most Magnificent Thing

by Ashley Spires

"Award-winning author and illustrator Ashley Spires has created a charming picture book about an unnamed girl and her very best friend, who happens to be a dog. The girl has a wonderful idea. "She is going to make the most MAGNIFICENT thing! She knows just how it will look. She knows just how it will work. All she has to do is make it, and she makes things all the time. Easy-peasy!" But making her magnificent thing is anything but easy, and the girl tries and fails, repeatedly. Eventually, the girl gets really, really mad. She is so mad, in fact, that she quits. But after her dog convinces her to take a walk, she comes back to her project with renewed enthusiasm and manages to get it just right. For the early grades' exploration of character education, this funny book offers a perfect example of the rewards of perseverance and creativity. The girl's frustration and anger are vividly depicted in the detailed art, and the story offers good options for dealing honestly with these feelings, while at the same time reassuring children that it's okay to make mistakes. The clever use of verbs in groups of threes is both fun and functional, offering opportunities for wonderful vocabulary enrichment. The girl doesn't just "make" her magnificent thing -- she "tinkers and hammers and measures," she "smoothes and wrenches and fiddles," she "twists and tweaks and fastens." These precise action words are likely to fire up the imaginations of youngsters eager to create their own inventions and is a great tie-in to learning about Science, Technology, Engineering and Math."



Souce: <http://tinyurl.com/yak7setr>



**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

- 11 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 18 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 18 Stewardship Mob Privet Pull • 4:30pm-6:30pm • Noonday Creek Trail, Bells Ferry Road Trailhead
- 25 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 26 Homeschool Winter Science Series-Snakes of Cobb County • 10:30am - 12:00pm • Cobb County Water Quality Laboratory
- 27 Adopt-A-Stream Macroinvertebrate Monitoring Workshop • 10:30am - 2:30pm • Cobb County Water Quality Laboratory

February

- 1 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 8 Stewardship Mob Privet Pull • 4:30pm-6:30pm • Sweat Mountain Park
- 15 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 15 Adopt-A-Stream Chemical Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 22 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 23 Community Privet Pull • 4:00pm-6:00pm • Location TBD
- 16-17 Georgia Organics Conference & Expo • Savannah, GA • <http://conference.georgiaorganics.org/>
- 27 Homeschool Winter Science Series-Frogs of Cobb County • 11:00am - 12:30pm • Cobb County Water Quality Laboratory

March

- 1 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 2-4 Environmental Education Alliance of GA Conference • Unicoi State Park • Helen, GA • www.eealliance.org
- 7 Adopt-A-Stream Bacterial Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 8 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 13 Stewardship Mob Storm Drain Marking • 4:30pm-6:30pm • Tramore Park
- 15 Frog Monitoring Workshop • 7:00pm-9:00pm • Lost Mountain Park
- 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
- 23-24 Adopt-A-Stream Confluence • Gwinnett Environmental & Heritage Center • Buford, GA • adoptastream.georgia.gov.
- 28 Watershed Stewardship Fair • 6:30pm - 8:30pm • Cobb County Water Quality Laboratory

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