

# the Thalweg

Watershed Stewardship Program

Spring 2012

Volume 9 Issue 2

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## What is a frog's favorite time of year?

### Leap Year!

What an incredible winter! With the mild temperatures, flora and fauna alike are more active much sooner than normal, especially the frogs and toads (also known as anurans). We have recently heard wonderful choruses of spring peepers, upland chorus frogs, and southern leopard frogs while visiting the incredible wetlands along the Chattahoochee River and other wetlands scattered throughout the county. As we progress through spring into summer more species will begin calling.

There are over 3,700 species of anurans in the world. 92 in the US, 31 species in Georgia, and 15 that can be found in Cobb County. Unfortunately, amphibian species have been declining worldwide since the 1980s. They have suffered directly from habitat loss, collateral affects of climate change, and chemical pollution.

Amphibians are considered excellent bioindicators because of their sensitivity to environmental change, like the canary in the coal mine. Their double life cycle, called metamorphosis, exposes them to both aquatic and terrestrial pollutants. Also, the complexity of metamorphosis can also be easily affected by chemical pollutants which can lead to deformities. Anurans are ectothermic, or cold-blooded, which means their internal temperature depends on the surrounding environment. They also have permeable skin, which takes in water to prevent dehydration. Although dependent on water sources, they are not able to migrate long distances from potentially contaminated water sources. The combination of these characteristics has caused the amphibians to be very susceptible to environmental changes.

In response to amphibian decline, many programs have been developed to monitor amphibian populations. A growing number of Cobb County residents are voicing their concern about not hearing as many anuran voices as in the past. With volunteer help, we can accurately account for species occurrence and abundance in Cobb County neighborhoods and wetlands. The monitoring is very simple to complete. Choose a site, listen for anurans calling, and submit your data. If you are interested in conservation, environmental protection, and having fun listening for wildlife, help us monitor the frogs and toads of Cobb County. Our Anuran Workshop on April 12th will introduce the incredible sounds of each frog and toad that might be heard in Cobb County! We hope you will join us.

# Venomous Snakes of Georgia

Article by Linda May, Environmental Outreach Coordinator  
Georgia Department of Natural Resources

According to the National Wildlife Federation, at least 20% of the U.S. population suffers some degree of snake fear. Regardless of the cause, extreme fear is unnecessary. Snakes are not under every rock or behind every tree; encounters are relatively infrequent. Typically, the more people learn about snakes, the less they fear them. By learning about species identification and distribution as well as the fascinating natural history of these reptiles, you will greatly reduce your fear of Georgia's snakes and enjoy the outdoors more.

**Probability of Snakebite:**

Venomous snakes of Georgia pose little threat to humans who leave them alone.

- Lightning kills many more people every year than snakes do.
- The probability of dying in a car accident far exceeds the chance of dying from a venomous snake bite.
- As many as half of all bites by venomous snakes are mild or “dry” bites in which little or no venom is injected.

Out of 10,000 snakebites the U.S. per year, only 12-15 result in death. Therefore, your chance of survival is 499 out of 500.

**In Case of a Snakebite:**

Before snakebite treatment is necessary, the snake must be venomous. Using a field guide, familiarize yourself with the 6 species of venomous snakes that live in Georgia. If the snake is non-venomous, simply wash the affected area with soap and water. If the snake is venomous, follow these “Do’s” and notice these “Don’ts”:

- DO stay calm! Keep the bitten area below heart level, and remove rings, watches, and tight clothing. Try to identify the offending snake if you can do so easily, without putting yourself at risk or wasting valuable time.
- DO get to the nearest hospital or emergency medical facility immediately, even if you suspect a dry bite. The universal treatment for a serious snakebite is the use of antivenin or snakebite serum, which should only be administered by a medical doctor. If local doctors aren’t sure which antivenin to use, advise them to contact the American Association of Poison Control Centers (1-800-222-1222).
- DON’T eat or drink anything, including alcoholic beverages or medicines.
- DON’T run or engage in strenuous activity.
- DON’T cut into or incise bite marks with a blade
- DON’T apply a tourniquet after a pit viper bite (although it may be helpful after an elapid bite).
- DON’T use a stun gun or other electrical shock.
- DON’T freeze or apply extreme cold to the area of the bite.

Field herpetologists consider car keys & a car to be the best snakebite kit.

**Georgia Laws Regarding Snakes:**

Many people feel “the only good snake is a dead snake” and go out of their way to kill them. Harmless water snakes often are mistaken for cottonmouths and are killed “just in case.” However, killing non-venomous snakes is illegal in Georgia. Keeping native non-venomous snakes as pets also is illegal without the proper permits (call the DNR Special Permits Office at 770-761-3044 for info on obtaining exhibition permits for educational purposes). Venomous snakes, although beneficial, are not protected since they may pose a threat to humans. Be sure you know which 6 of the 41 species of snakes in Georgia are venomous. If possible, simply leave venomous snakes alone; you don’t need to kill them just because it’s legal.

**Online Resources**

Georgia DNR Reptile and Amphibian Conservation  
<http://www.georgiawildlife.com/GeorgiaSnakes>

How Dangerous Are Venomous Snakes In America?  
<http://srelherp.uga.edu/projects/snakebit.htm>

Snakes of South Carolina and Georgia  
<http://srelherp.uga.edu/snakes/index.htm>

## VENOMOUS SNAKES OF GEORGIA

### PIT VIPERS (Family Viperidae):

"Pit vipers" have a heat-sensing "pit" between their eye and nostril. Their fangs fold up against the roof of their mouth. These snakes are generally stockier in appearance than long, skinny non-venomous snakes and typically have triangular-shaped heads (although some non-venomous water snakes do too), vertical pupils, and a single row of belly scales under their vent.

#### • COPPERHEAD (*Agkistrodon contortrix*):



**Uncommon to common.** Copperheads are apparently more tolerant of urban development than many snake species, and populations often persist in suburban neighborhoods as long as some patches of forest remain. Found in hardwood forests, both wet and dry. Adults reach 2-3 feet in length and are light brown to pinkish in color with darker, saddle-shaped crossbands. Young copperheads have a bright yellow tail tip that is used to lure small prey.



#### • COTTONMOUTH (*Agkistrodon piscivorus*):



**Abundant.** Found in every type of wetland habitat but travels across land in search of food. Adults reach 3-4 feet in length and vary in color. Their backs may be drab brown or olive with darker crossbands. The belly is dull yellow and brown, and the underside of the tail is usually black. Unlike other water snakes, the cottonmouth has a black band from its eyes extending towards its neck and often stands its ground with an open-mouthed threat display. Like the copperhead, young cottonmouths have bright yellow tail tips.



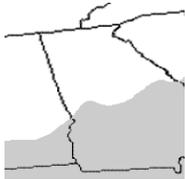
#### • TIMBER RATTLESNAKE (CANEBRAKE) (*Crotalus horridus*):



**Common** in much of the Coastal Plain but the range is highly fragmented in the Piedmont and under increasing pressure from residential development. Found in a variety of terrestrial habitats as well as swamps. Adults may reach up to 5 feet in length. Their basic color is gray with black V-shaped crossbands. Some may have an orange-brown stripe down the middle of their back. The tail is black with rattles at the tip. This species is passive if not pestered, rarely attacking if you back away and leave it alone.



#### • EASTERN DIAMONDBACK RATTLESNAKE (*Crotalus adamanteus*):



**Rare, Georgia Species of Concern.** Human impacts have caused the species to decline throughout its range. Found mostly in dry terrestrial habitats but also wet areas. Adults may reach up to 6+ feet in length. Their basic color is light to dark brown with distinct diamonds of brown and yellow. The tail is banded and has rattles. Because of this snake's huge size and potent venom, it is considered by some to be the most dangerous snake in the United States.



#### • PIGMY RATTLESNAKE (*Sistrurus miliarius*):



**Uncommon.** In some areas of Georgia, this rattlesnake can be found in very high population densities, but in other places they can be fairly uncommon. However, this species is small and cryptic, and chances are that many individuals are overlooked. Found in wooded areas and swamps. Adults are heavy-bodied but rarely more than 1 foot long. They are dull gray with dark gray or brown blotches on the back and sides. This species is so small that people rarely see them coiled in pine straw or dead leaves.



### ELAPIDS (Family Elapidae):

This snake family includes cobras, kraits, and coral snakes—all of which have fixed fangs. Only one elapid species lives in Georgia, and it has short, fixed fangs in the front of its mouth.

#### • EASTERN CORAL SNAKE (*Micrurus fulvius*):



**Rare, Georgia Species of Concern.** This species is generally distributed and seemingly fairly common in the lower and middle Coastal Plain of southeastern Georgia. Found in a wide variety of habitats including wooded areas, fields, and pond margins. Adults reach about 2 feet in length. With red, yellow, and black rings encircling the body, this species may be confused with the non-venomous Scarlet Kingsnake, which has similar band colors. However, the two species may be distinguished by the order of their colored bands: "Red touch yellow harms a fellow" = the venomous Coral Snake. "Red touch black, venom lack/friend of Jack" = the non-venomous Scarlet Kingsnake. Coral snake bites can be quite serious, so don't pick up this snake just because it's pretty!



# The Water Cycle: Infiltration

Article by: United States Geological Survey (USGS)

## Groundwater begins as precipitation

Anywhere in the world, a portion of the water that falls as rain and snow infiltrates into the subsurface soil and rock. How much infiltrates depends greatly on a number of factors. Infiltration of precipitation falling on the ice cap of Greenland might be very small, whereas, as this picture of a stream disappearing into a cave shows, a stream can act as a direct funnel right into ground water!



Some water that infiltrates will remain in the shallow soil layer, where it will gradually move vertically and horizontally through the soil and subsurface material. Eventually, it might enter a stream by seepage into the stream bank. Some of the water may infiltrate deeper, recharging groundwater aquifers. If the aquifers are porous enough to allow water to move freely through it, people can drill wells into the aquifer and use the water for their purposes. Water may travel long distances or remain in groundwater storage for long periods before returning to the surface or seeping into other water bodies, such as streams and the oceans.

## Factors affecting infiltration

**Precipitation:** The greatest factor controlling infiltration is the amount and characteristics (intensity, duration, etc.) of precipitation that falls as rain or snow. Precipitation that infiltrates into the ground often seeps into streambeds over an extended period of time, thus a stream will often continue to flow when it hasn't rained for a long time and where there is no direct runoff from recent precipitation.

**Soil characteristics:** Some soils, such as clays, absorb less water at a slower rate than sandy soils. Soils absorbing less water result in more runoff overland into streams.

**Soil saturation:** Like a wet sponge, soil already saturated from previous rainfall can't absorb much more ... thus more rainfall will become surface runoff.

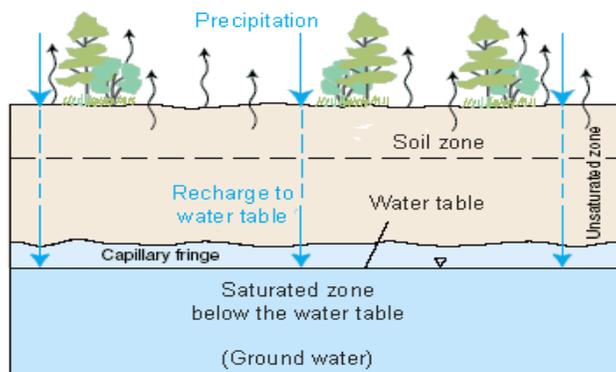
**Land cover:** Some land covers have a great impact on infiltration and rainfall runoff. Vegetation can slow the movement of runoff, allowing more time for it to seep into the ground. Impervious surfaces, such as parking lots, roads, and developments, act as a "fast lane" for rainfall - right into storm drains that drain directly into streams. Agriculture and the tillage of land also changes the infiltration patterns of a landscape. Water that, in natural conditions, infiltrated directly into soil now runs off into streams.

**Slope of the land:** Water falling on steeply-sloped land runs off more quickly and infiltrates less than water falling on flat land.

**Evapotranspiration:** Some infiltration stays near the land surface, which is where plants put down their roots. Plants need this shallow ground water to grow, and, by the process of evapotranspiration, water is moved back into the atmosphere.

## Subsurface water

As precipitation infiltrates into the subsurface soil, it generally forms an unsaturated zone and a saturated zone. In the unsaturated zone, the voids—that is, the spaces between grains of gravel, sand, silt, clay, and cracks within rocks—contain both air and water. Although a lot of water can be present in the unsaturated zone, this water cannot be pumped by wells because it is held too tightly by capillary forces. The upper part of the unsaturated zone is the soil-water zone. The soil zone is crisscrossed by roots, openings left by decayed roots, and animal and worm burrows, which allow the precipitation to infiltrate into the soil zone. Water in the soil is used by plants in life functions and leaf transpiration, but it also can evaporate directly to the atmosphere. Below the unsaturated zone is a saturated zone where water completely fills the voids between rock and soil particles.

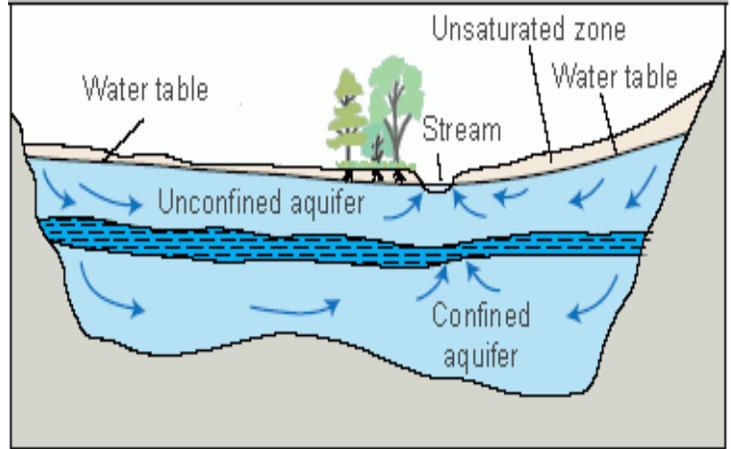


**Infiltration replenishes aquifers**

Natural refilling of deep aquifers is a slow process because ground water moves slowly through the unsaturated zone and the aquifer. The rate of recharge is also an important consideration. It has been estimated, for example, that if the aquifer that underlies the High Plains of Texas and New Mexico—an area of slight precipitation—was emptied, it would take centuries to refill the aquifer at the present small rate of replenishment. In contrast, a shallow aquifer in an area of substantial precipitation such as those in the coastal plain in south Georgia, USA, may be replenished almost immediately.

**Artificial recharge gives natural infiltration a push**

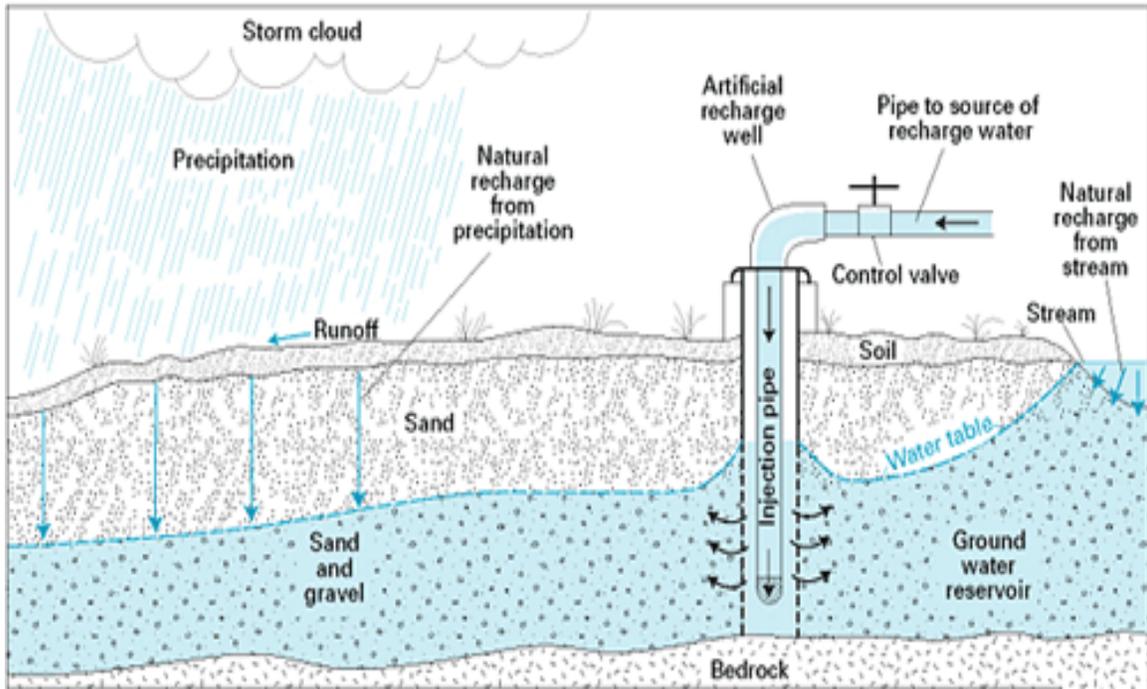
People all over the world make great use of the water in underground aquifers all over the world. In fact, in some places, they pump water out of the aquifer faster than nature replenishes it. In these cases, the water table, below which the soil is saturated and possibly able to yield enough water that can be pumped to the surface, can be lowered by the excessive pumping. Wells can "go dry" and become useless.



In places where the water table is close to the land surface and where water can move through the aquifer at a high rate, aquifers can be replenished artificially. For example, large volumes of ground water used for air conditioning are returned to aquifers through recharge wells on Long Island, New York. Aquifers may be artificially recharged in two main ways:

**Rapid-infiltration pits:** One way is to spread water over the land in pits, furrows, or ditches, or to erect small dams in stream channels to detain and deflect surface runoff, thereby allowing it to infiltrate to the aquifer

**Groundwater injection:** The other way is to construct recharge wells and inject water directly into an aquifer



Reference

USGS: <http://ga.water.usgs.gov/edu/watercycleinfiltration.html>



# welcome

Cindy Nablo & family will be monitoring Mud Creek.

Sally Brooking will be monitoring Sope Creek.

Joe Lukas will be monitoring Nickajack Creek.

North Cobb Christian School will be monitoring Butler Creek.

Bobby Brooks will be monitoring Mud Creek.

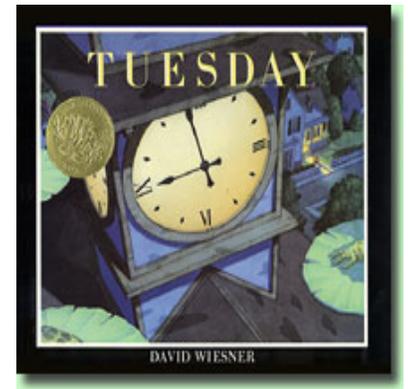
## PROGRAM NEWS

### RECOMMENDED RESOURCE

*Tuesday* by David Wiesner

An opening of the eyes and mind to the limitless possibilities of an ordinary day.

In this ingenious and imaginative nearly wordless picture book, frogs in a pond lift off with their lily pads and fly to a nearby town. There they zoom through a woman's living room as she dozes in a chair watching television, harass a dog frolicking in his yard, and distract a bathrobed citizen from his midnight snack. The unpredictable events of this particular Tuesday unfold before the reader with the precision and clarity of a silent movie. What will happen next Tuesday?



#### Reviews

"Sort of science fiction, sort of National Enquirer, sort of 1940s-style detective story, sort of 1960s-style comic book. Totally fun." — Los Angeles Parent, review

"Kids will love its lighthearted, meticulously imagined, fun-without-a-moral fantasy. Tuesday is bound to take off." — School Library Journal, starred review

"A surreal, almost wordless picture book shows the mysterious levitation of lily pads and frogs from a pond one Tuesday at dusk. The frogs soar around town until they fall to the ground at sunrise. Large, detailed watercolors use dramatic points of view and lighting effects and often show a humorous range of expressions. There is a forecast of further surprises to come on following Tuesdays." — Horn Book

## ANNOUNCEMENTS

### Volunteers of the Year

Each year, Cobb County hosts the Watershed Stewardship Fair to thank those who have donated their time and energy to improve local water quality by volunteering with the county's Watershed Stewardship Program. During the 2011-2012 reporting year, over 400 individuals have given service to Cobb Water through various projects including waterway data collection, storm drain marking and stream cleanup events, and rain garden maintenance. This year, four watershed stewards are being especially recognized for their efforts.

**The Adopt-A-Stream Volunteer of the Year** is **Eric Lee** who consistently monitors seven waterway locations each month in the Bishop Lake area of the Chattahoochee Watershed. Eric started his project in 2009 and since starting has conducted over 175 monitoring events. Each site visit takes approximately one hour to complete so Eric is giving almost full day of service to Cobb Water each month.

**The School of the Year** is **Nicholson Elementary School**, located adjacent to Rubes Creek in the Etowah Watershed. Teacher, Cheryl Ashley-Serafine and her third grade target students have been monitoring the water quality around their campus since 2007. When they started the school year, they found the sewer easement along the stream had become an illegal dump site for vegetative and household debris. They have been actively advocating with the school district to clean up the site.

Our **Community Organizer of the Year** is **Carla Loosier**. Carla has been working with our program since 2004 when she mentored a high school student through his senior project on stream monitoring. Since then, we've had the pleasure of working with Carla on several projects. She consistently brings in the local children, helping educate them on the importance of community service and their role and responsibility as environmental stewards. Recently, Carla has been working with local youth marking storm drains and cleaning up our streams in addition to collecting stream data at her site on Gable Creek in the Chattahoochee Watershed.

In December 2011, Cobb County Master Gardeners accepted the rain and wildlife garden installed at Cobb's Water Quality Laboratory as an official project of their local nonprofit organization. One individual has consistently given her time and expertise to help our staff maintain the garden, **Diane Powell**. Diane has been working on our garden weekly, spending two hours every visit, pulling weeds, pruning, installing new plantings, transplanting, etc. as needed throughout the year. Even through the heat of summer and the cold days of winter, she shows up and works very hard. She is our **Rain and Wildlife Garden Volunteer of the Year**, having given over 60 hours of service in the garden since we started the project last year, working over 30 weeks of the year.

We'd like to thank each of these volunteers for their extraordinary help.

# OBSERVATIONS



Turtles may crawl out of their shells in cartoons, but not in real life. A turtle's backbone is built into the top of its shell, which is called the carapace. When threatened, a turtle often pulls in its head, tail, and legs for protection. In some species, the bottom part of the shell (called the plastron) is hinged, forming such a tight closure that not even a knife can pry the two halves open. This adaptation helps many turtles to live 50 years or more in the wild. In captivity, turtles can live even longer, with some reaching over 100 years old!

Linda May, Environmental Outreach Coordinator  
GA Dept. of Natural Resources  
Wildlife Resources Division

## ECOPEDIA

### Photosynthesis

All life on Earth ultimately depends on light from the sun and carbon from the air for food. But only specialized living beings—photosynthetic bacteria, algae, and plants—can accept sunlight energy and use carbon to make food in the form of their bodies. These are the sole truly productive organisms on Earth, and all their forms of life in their vastly complex ecological interrelationships are utterly dependent on them. (This is true even of bacteria that live on the pitch-dark ocean floor and a few other types that live by reacting photosynthesis-derived oxygen with compounds of sulfur, nitrogen, iron, and other elements.) If we look back over the whole history of life on the planet, the evolution of photosynthesis by early bacteria was the most important single event. Without photosynthesis, Earth would have remained a dead planet.

*From Ecology: A Pocket Guide*

## Congratulations to Rebecca Kapala

Rebecca completed *The Girl Scout's Water Drop Patch Project!* The project, developed in partnership with the Environmental Protection Agency, focuses on water quality and community action to protect and restore local water resources. Rebecca is an Adopt-A-Stream volunteer and regularly monitors Gable Creek. She also participates in storm drain marking events. Congratulations Rebecca and keep up the great work!

## CONSERVATION TIP

### Hiking

Minimize the impact of hiking activities by leaving behind only footprints and keeping those footprints on established trails. In the United States each year, over two hundred thousand miles of trails are trodden by some seventy-five million American hikers. Collectively, they could make a boot print twice the size of the president's 125-acre Camp David compound.

*From The Green Book*

## 6th Annual River Rendezvous on Rottenwood Creek

Sierra Club's Centennial Group and Cobb County Water System will hold their 6th Annual River Rendezvous on Saturday April 21, providing a snapshot of water quality in the Rottenwood Creek watershed.

Participants perform Adopt-A-Stream chemical and bacteria tests at 30 sites. Samples are also brought to the Cobb County Water Quality Laboratory for more extensive testing including turbidity and total suspended solids. Ten teams, each lead by a certified Adopt-A-Stream chemical monitor, visit three sites for testing. They are supplied with test kits, sample bottles, maps, trash bags for site cleanup, and disposable cameras to document their work.



with the field measurements and lab results, are shared with GA's Environmental Protection Division. 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.

The River Rendezvous is a fun event for all ages and 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 or consider participating in this year's River Rendezvous event. Visit our calendar of events for upcoming volunteer opportunities.

**We hope to see you on Saturday, April 21!**

## SEASONAL HAPPENINGS

### Outdoor Romping & Creek Stomping Summer 2012 Family Series

The Watershed Stewardship Program is partnering with Cobb Parks, Recreation and Cultural Affairs again this summer to offer four adventure sessions (9am-11am). **Cost: \$2.00/person.**

Mark your calendars!

- Creek Hike, June 6th, East Cobb Park
- Wetlands, June 20th, Acworth-Corp Property
- Scavenger Hunt, July 11th, Heritage Park
- Creek Hike, July 18th, Covered Bridge Rd

**Contact: Karen.faucett@cobbcounty.org**



*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

## April

- 12 Community Ecology: Frog & Toad Walk • 6pm - 8pm • Corp Property
- 17 Rain Barrel Workshop • 10am - 11am • Cobb County Water Quality Laboratory
- 17 Frog & Toad Monitoring Workshop • 6pm - 8:30pm • Cobb County Water Quality Laboratory
- 19 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 21 River Rendezvous • 8am - 1 pm • Cobb County Water Quality Laboratory
- 26 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 26 Adopt-A-Stream Chemical Monitoring Workshop • 6pm-8:30pm • Cobb County Water Quality Laboratory

## May

- 3 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 10 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 12 Cobb County Master Gardener Plant Sale • 10am - 4pm • Chestnut Ridge Christian Church, Marietta
- 16 Rain Barrel Workshop • 3pm - 4pm • Cobb County Water Quality Laboratory
- 19 Adopt-A-Stream Biological Monitoring Workshop • 10am-3pm • Cobb County Water Quality Laboratory
- 24 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 31 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory

## June

- 5 Summer Library Series • 3:30pm - 4:30pm • Mountain View Library
- 6 Summer Family Program - Creek Hike • 9am - 11am • East Cobb • \$2.00/person • contact: Karen.Faucett@cobbcounty.org
- 7 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 9 Storm Drain Marking Event • 9am - 1pm • Cobb County Water Quality Laboratory
- 12 Summer Library Series • 11am - 12pm • Stratton Library
- 13 Summer Library Series • 2pm - 3pm • Vinnings Library
- 14 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory
- 14 Summer Library Series • 3:30pm - 4:30pm • East Cobb Library
- 15 Rain Barrel Workshop • 10am - 11am • Cobb County Water Quality Laboratory
- 19 Summer Library Series • 3:30pm - 4:30pm • West Cobb Library
- 20 Summer Family Program - Wetlands • 9am - 11am • Corp Property • \$2.00/person • contact: Karen.Faucett@cobbcounty.org
- 21 Adopt-A-Stream Bacteria Monitoring Workshop • 6pm - 8:30pm • Cobb County Water Quality Laboratory
- 27 Summer Library Series • 3:30pm - 4:30pm • Kennesaw Library
- 28 Garden Work Day • 9am - 11am • Cobb County Water Quality Laboratory