

the Thalweg

Watershed Stewardship Program

Winter 2017

Photo Credit: Deone Higgs, 2013, <http://tinyurl.com/>

Volume 14 Issue 1

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Monitoring Water Quality Through Macroinvertebrates - Volunteers Needed

Macroinvertebrates are organisms that lack a backbone and can be seen with the naked eye. They are an important function of many food chains and balanced ecosystems. Spending an afternoon splashing in a stream carefully turning stones and sifting through leaf packs can reveal these mysterious organisms, each with their own survival adaptations. Their presence or absence may tell a story about the conditions of our watersheds because they are obligated to spend the early stages of their life cycle in the water.

The Cobb County Watershed Stewardship Program is offering a free Macroinvertebrate Monitoring Workshop this month. Participants will learn how to collect and identify 20 organisms commonly found in our local waterways and how to index these taxa by their tolerance levels to pollution. The skills acquired during this workshop can be implemented at any stream. The data collected will provide important information about where targeted education efforts could be concentrated to help prevent non-point source type pollution. This workshop is offered annually in Cobb County, so register soon to reserve your spot.

The Macroinvertebrate Monitoring Workshop will be held at the Water Quality Laboratory, with a visit to a nearby stream, on Saturday, January 21, 2017 from 10:30AM – 2:30PM. Pre-registration is required and space is limited to 20 participants. Participants must be able to tread unsteady terrain and wade in a shallow water stream.

For more information about the workshop, and to register, email water_rsvp@cobbcounty.org.



Stonefly Light and Dark

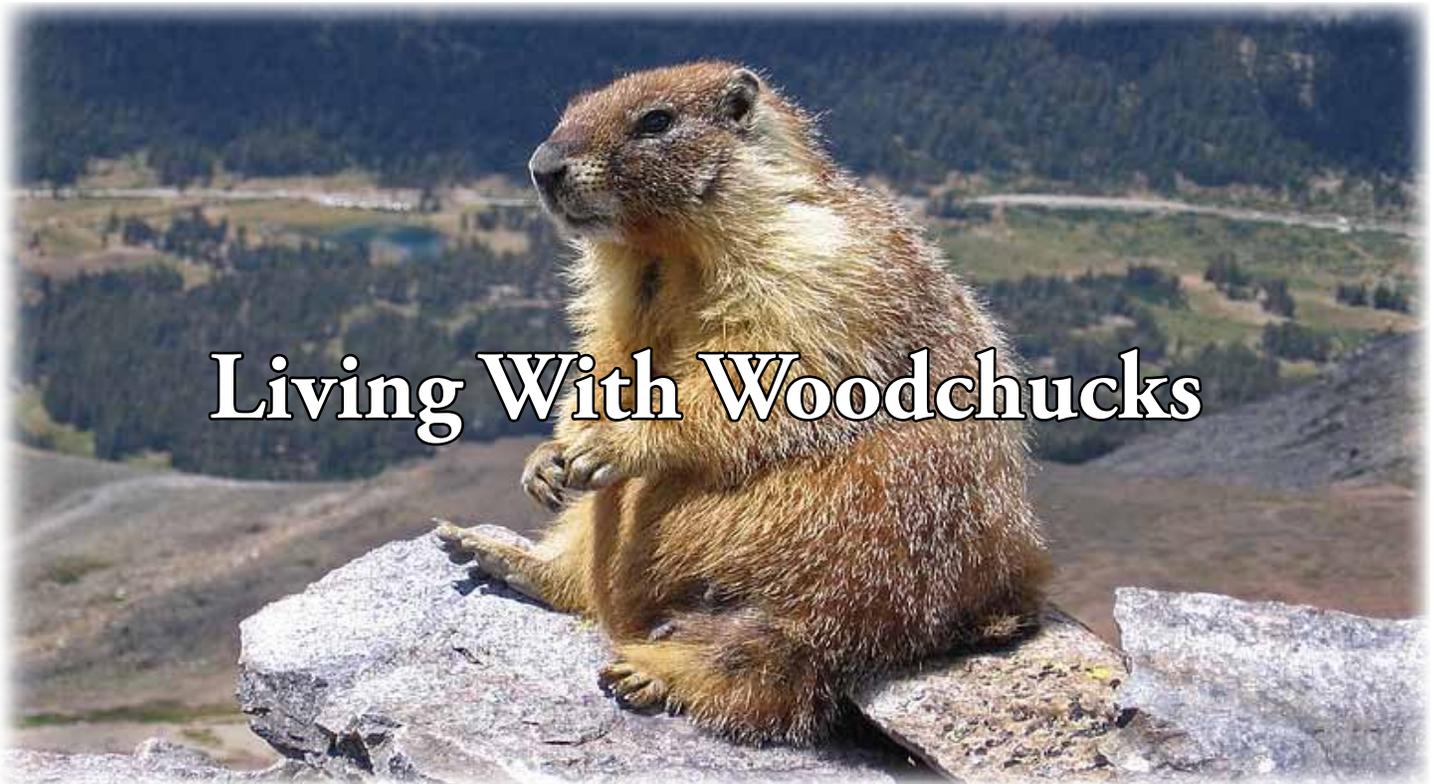


Dragonfly Larvae



Dobsonfly





Living With Woodchucks

Photo Source: <https://commons.wikimedia.org/wiki/File:Marmot-edit1.jpg>

Many are familiar with woodchucks (*marmota monax*) through tongue-twisters, movies, or events such as Groundhog Day, but not many are aware of their specific habits, behaviors, and habitats. Also known as whistle pigs, groundhogs, and marmots, they are familiar to those living in the piedmont and mountain areas of Georgia. Woodchucks are common residents in both rural and urban areas and are most active in early morning and late evening. Their reddish brown fur is often grey tipped with shades of yellow and black intermixed. Both their head and tail have a flat appearance with small, rounded, inconspicuous ears. Although young are dependent on the female at birth, woodchuck pups are already independent at 8 weeks of age and able to survive on their own.

Woodchucks prefer open areas such as fields, clearings, open forests and rocky slopes. However, they seem to gravitate toward areas that are more brushy or weedy in nature or areas that have received disturbance at some point and are now "grown up." Areas such as fencerows, embankments, retaining walls, dams or kudzu patches make for excellent woodchuck living. In order to provide themselves with increased protection from predators, woodchucks will dig an extensive network of burrows. Burrows usually have a main entrance and numerous other side entrances from which to escape from predators such as coyotes, bobcats, foxes, hawks and owls. The series of openings and tunnels lead to a nesting area for sleeping, hibernating, and raising young, as well as a toilet chamber. Not only do these burrows provide safety and security for woodchucks, but abandoned burrows also are utilized by various other species of wildlife such as foxes, skunks, snakes and raccoons.

Aside from their excellent ability at building intricate burrows, woodchucks have other methods for evading predators. The first is their ability to climb trees. Although considered a ground dweller, woodchuck's sharp claws allow them to climb trees quickly and avoid confrontations. Their second evasive method is their whistling behavior, which earned them the nickname "whistle pig." Although woodchucks are solitary creatures, they frequently live in the area of other woodchucks and will use this whistling behavior as a warning system. Even though they do not like to share their living space with other woodchucks, it is theorized that they work together for the sake of safety.

Woodchucks feed extensively and almost completely on plant material, so they are often found feeding on a wide variety of grasses, plants, leaves, ferns, fruits, and bark. Favorite plants include clover, alfalfa and dandelion, as well as fruits and vegetables whenever available. When foraging, they are exposed to predators and must eat quickly. Eating this "fast food" helps to minimize their time above ground and their chance of contact with predators.

Woodchuck's size and lifespan, like most animals, depends on the quality of their habitat. Typically, woodchucks grow to 15-25 inches, including a 7-9 inch tail, and weigh between 10 and 15 pounds. With fewer natural predators and larger quantities of food, they can grow to around 30 inches and 30 pounds. In captivity, woodchucks can live up to 10 years, in the wild the average lifespan is 2-3 years.



Photo Credit: Le Flâneur, July 1, 2011, <http://tinyurl.com/js9sr93>

To many, woodchucks are seen as a nuisance and are animals that serve no purpose to humans. Just the possibility that woodchucks might cause problems one day is used as an excuse to “control” them. While woodchucks may not appear useful to human, they do serve a purpose in the ecosystem. They provide food for coyotes, foxes, weasels, badgers, hawks, and eagles. Their burrows give shelter to amphibians, reptiles, smaller rodents, and even larger animals such as foxes. Woodchucks and people can coexist without conflict, but if the woodchuck is causing problems and needs to be removed, there are humane methods to evict the woodchuck from your property.

When humanely evicting a woodchuck, timing is critical. Breeding females have dependent young in their burrows from late winter until spring or early summer and will typically resist abandoning their young, even when in grave danger. If you pay attention to the burrow exits, you may actually see the young woodchucks in their first ventures above ground. If you do, you can begin your eviction about three weeks later with relative assurance the dependant offspring will be out of the burrow.

The first step to evicting woodchucks is to determine if the burrow is even occupied. Loosely plug all of the burrow entrances with grass clippings, newspaper, or similar material. After a few days of clear warm weather, if the material has not been disturbed you can assume the burrow is unoccupied. To permanently close the burrow, entrances and exits can be covered with heavy-gauge, welded fencing wire.

If the burrow is occupied, you can harass the woodchucks to leave by placing strong smelling substances just inside the entrance, or scare the woodchucks with mylar helium balloons or beach balls placed at burrow entrances. Flexible fencing can be placed around gardens to keep woodchucks out. Even though they are good climbers, when installed properly, fencing will keep the woodchucks out of gardens. Habitat modification, such as removing tall grass or brush, can make woodchucks feel unsafe and encourage them to locate to a new area.

For more information and details on humanely vacating woodchucks from your property, visit <http://tinyurl.com/go9xzfl>.

Resources:

<http://www.georgiawildlife.com/node/1125>

<http://www.gahomeservices.com/north-georgia-wildlife-woodchucks/>

<http://www.sheppardsoftware.com/content/animals/animals/mammals/marmot.htm>

<http://blog.nwf.org/2011/01/10-things-you-may-not-know-about-groundhogs/>

http://www.humanesociety.org/animals/woodchucks_groundhogs/tips/solving_problems_woodchucks.html?referrer=https://www.google.com/

10 Things You May Not Know About Groundhogs



1. Groundhogs are among the few animals that are true hibernators, fattening up in the warm seasons and snoozing for most of three months during the chill times.
2. While hibernating, a woodchuck’s body temperature can drop from about 99 degrees to as low as 37 degrees (Humans go into mild hypothermia when their body temperature drops a mere 3 degrees, lose consciousness at 82 degrees and face death below 70 degrees).
3. The heart rate of a hibernating woodchuck slows from about 80 beats per minute to 5.
4. Breathing slows from around 16 breaths per minute to as few as 2.
5. During hibernation—150 days without eating—a woodchuck will lose no more than a fourth of its body weight thanks to all the energy saved by the lower metabolism.
6. During warm seasons, a groundhog may pack in more than a pound of vegetation at one sitting, which is much like a 150-pound man scarfing down a 15-pound steak.
7. To accommodate its bodacious appetite, woodchucks grow upper and lower incisors that can withstand wear and tear because they grow about a sixteenth of an inch each week.
8. If properly aligned, woodchuck’s upper and lower incisors grind away at each other with every bite, keeping suitably short; when not in good order, they may miss one another and just keep growing until they look like the tusks on a wild boar; if too long, a woodchuck’s upper incisors can impale the lower jaw, with fatal results.
9. Woodchuck burrows, which the animals dig as much as 6 feet deep, can meander underground for 20 feet or more, usually with two entrances but in some cases with nearly a dozen.
10. Burrows provide groundhogs with their chief means of evading enemies, because the rotund little guys (just before hibernation, a hefty woodchuck may tip the scales at 14 pounds) are too slow to escape most predators in a dead heat: the rodents have a top speed of only 8 mph, while a hungry fox may hit 25 mph.

Source: <http://blog.nwf.org/2011/01/10-things-you-may-not-know-about-groundhogs/>

Rusty patched bumble bee proposed for U.S. endangered species status

<http://www.xerces.org/rusty-patched-bumble-bee/>
<http://www.xerces.org/blog/usfws-esa-protection-rusty-patched/>

The rusty patched bumble bee is an eastern bee whose workers have a small rust-colored patch on the middle of their second abdominal segment. This bee was once commonly distributed throughout the east and upper Midwest of the United States, but has declined from an estimated 87% of its historic range in recent years. The rusty-patched bumble bee is an excellent pollinator of wildflowers, cranberries, and other important crops, including plum, apple, alfalfa and onion seed.

Historically, the rusty-patched bumble bee was distributed along the east coast of the United States from southern Maine south through Georgia with an extension west along the northern states through Minnesota. A few individuals have been found as far west as North Dakota. The former range of the Rusty-patched bumble bee includes these states: Minnesota, Wisconsin, Indiana, lower Michigan, Ohio, Pennsylvania, New York, Vermont, New Hampshire, Maine, Maryland, Virginia, North Carolina, South Carolina, Georgia, Connecticut, Massachusetts, Delaware, New Jersey, West Virginia, and portions of North Dakota, South Dakota, Iowa, Illinois, Kentucky, and Tennessee. A number of surveys have been done, but the Rusty-Patch Bumble Bee has not been found in most of its range since 2003 with the exception of a few isolated areas.

In 2013 the Xerces Society petitioned the U.S. Fish and Wildlife Service to protect the rusty patched bumble bee (*Bombus affinis*) as an endangered species. In September 2016, the U.S. Fish and Wildlife Service announced that it is proposing to list the rusty patched bumble bee as an endangered species under the Endangered Species Act. This is a huge victory for bumble bee conservation. Listing the rusty patched bumble bee under the ESA will require that its needs be considered when federal actions—like the registration of new pesticides—are taken. In addition, protecting this bee from threats of disease, pesticide, and habitat loss, may also help many of the other 3,600 species of native bees that exist on the American landscape.

Bumble bees are important pollinators of wild flowering plants and crops. As generalist foragers, they do not depend on any one flower type. However, some plants do rely on bumble bees to achieve pollination. Loss of bumble bees can have far ranging ecological impacts due to their role as pollinators. In Britain and the Netherlands, where multiple bumble bee and other bee species have gone extinct, there is evidence of decline in the abundances of insect pollinated plants.



Photo of the rusty patched bumble bee by Johanna James-Heinz
 Source: <http://www.xerces.org/rusty-patched-bumble-bee/>

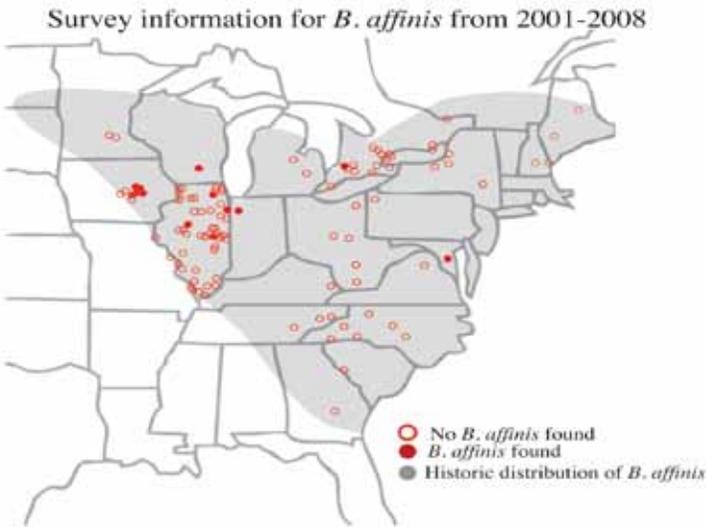
Bumble bees are also excellent pollinators of many crops. Bumble bees are able to fly in cooler temperatures and lower light levels than many other bees, and they perform a behavior called “buzz pollination”, in which the bee grabs the pollen producing structure of the flower in her jaws and vibrates her wing musculature causing vibrations that dislodge pollen that would have otherwise remained trapped in the flower’s anthers. Some plants, including tomatoes, peppers, and cranberries, require buzz pollination.

There are a number of threats facing bumble bees, any of which may be leading to the decline of the rusty-patched bumble bee. The major threats to bumble bees include: spread of pests and diseases by the commercial bumble bee industry, other pests and diseases, habitat destruction or alteration, pesticides, invasive species, natural pest or predator population cycles, and climate change.

Commercial bumble bee rearing may be the greatest threat to *Bombus affinis*. In North America, two bumble bee species have been commercially reared for pollination of greenhouse tomatoes and other crops: *B. occidentalis* and *B. impatiens*. Between 1992 and 1994, queens of *B. occidentalis* and *B. impatiens* were shipped to European rearing facilities, where colonies were produced then shipped back to the U.S. for commercial pollination. Bumble bee expert Robbin Thorp has hypothesized that these bumble bee colonies acquired a disease (probably a virulent strain of the microsporidian *Nosema bombi*) from a European bee that was in the same rearing facility, the Buff-tailed Bumble Bee (*Bombus terrestris*). Dr. Thorp hypothesized that the disease then spread to wild populations of *B. occidentalis* and *B. franklini* in the West (from exposure to infected populations of commercially reared *B. occidentalis*), and *B. affinis* and *B. terricola* in the East (from exposure to commercially reared *B. impatiens*). In the late 1990’s, biologists began to notice that *B. affinis*, *B. occidentalis*, *B. terricola*, and *B. franklini* were severely declining.

Many parts of this hypothesis were supported by recent scientific evidence which documented that commercial bumble bees were responsible for the spread and amplification of *Nosema bombi*, and that this likely has had a profound effect on wild bumble bees, including the rusty patched bumble bee. They did not find evidence that the pathogen had been introduced from Europe. Bumble bees are reared commercially for use as pollinators of agricultural crops and it has been clearly documented that these commercial bumble bees carry high pathogen loads, and regularly interact with wild bumble bees near greenhouses and in open field settings.

Besides the threat posed by the commercial bumble bee industry, there are many other threats to wild bumble bee populations. Bumble bees are threatened by many kinds of habitat alterations which may destroy, alter, fragment, degrade or reduce their food supply (flowers that produce the nectar and pollen they require), nest sites (e.g. abandoned rodent burrows and bird nests), and hibernation sites for over-wintering queens. Major threats that alter landscapes and habitat required by bumble bees include agricultural and urban development.



Livestock grazing also may pose a threat to bumble bees, as animals remove flowering food sources, alter the vegetation community, and likely disturb nest sites. As bumble bee habitats become increasingly fragmented, the size of each population diminishes and inbreeding becomes more prevalent. Inbred populations of bumble bees show decreased genetic diversity and increased risk of decline.

Insecticide applications on farms poses a direct threat to foraging bumble bees. Specifically, the use of highly toxic insecticides known as neonicotinoids continues to grow throughout the range of the rusty patched bumble bee. A number of scientific articles clearly document the lethal and sublethal effects that these chemicals are having on bees and other pollinators, and their use has intensified extensively within the rusty patched bumble bee's range during the same time period that declines have been observed. Moreover, the massive increase in the past two decades in the use of the herbicide glyphosate on genetically modified corn and soybean fields has been

effective at eliminating milkweed from the agricultural landscape. It is likely that other wildflowers have also been eliminated from farm edges – and it is reasonable to assume that a major loss of floral resources from the Upper Midwest could have had an effect on the rusty patched bumble bee. While no direct link has been made from the use of these pesticides to the declines observed in the rusty patched bumble bee there is little doubt that stressors like pesticides at the very least put increased pressures on an already imperiled bumble bee, especially when one considers the scope at which these chemicals are being adopted and used.

Bumble bees are also threatened by invasive plants and insects. The invasion and dominance of native grasslands by exotic plants may threaten bumble bees by directly competing with the native nectar and pollen plants that they rely upon. The small hive beetle (*Aethina tumida*) is an invasive parasite of the honeybee, yet it also infests bumble bee colonies. Its actual impact on bumble bee colonies could be severe, although it has not been well studied. In the absence of fire, native conifers encroach upon many meadows, which removes habitat available to bumble bees. Global climate change also poses a real threat to bumble bees; anecdotal evidence has suggested that some of the bumble bee species adapted to cool temperatures are in decline, whereas species adapted to warmer climates are expanding their ranges. Baseline data and long term monitoring are needed to better understand the true impact of climate change on bumble bees.

Great Horned Owl-*Bubo virginianus*

Although great horned owls begin looking for nest sites as early as September, nesting occurs in the dead of winter. While it is hard to believe the birds can nest in bone chilling temperatures, nesting great horned owls are so well adapted to nesting in the cold they have been found nesting in temperatures that dipped below minus-20 degrees Fahrenheit. Although great horned owls are excellent parents, home repair is not their strong suit. In fact, they do little if anything to repair a nest site. Consequently, it is not uncommon for their eggs or young to fall through gaping holes in a dilapidated nest. Remarkably, these unfortunate owlets will actually climb 40 or more feet back up to the nest. If they can't make the arduous climb back to their nest, their parents will continue to feed them on the ground.

Terry W. Johnson
Georgia DNR Wildlife Resources Division

OBSERVATIONS



A single owlet born in an old crow nest.
Source: <http://tinyurl.com/hl8eoc7>

ECOPEDIA

Limnology



Limnology is the study of inland waters. It is often regarded as a division of ecology or environmental science. It covers the biological, chemical, physical, geological, and other attributes of all inland waters (running and standing waters, both fresh and saline, natural or man-made). This includes the study of lakes and ponds, rivers, springs, streams and wetlands.

www.wikipedia.com

CONSERVATION TIP

Alternatives to Winter Rock Salt

Frozen and slippery doorways, driveways, and sidewalks can pose a danger during winter weather. Using traditional rock salt may create traction in these areas, but as snow and ice melt, excessive salt poisoning may occur from runoff through storm drains and into creeks, rivers, lakes, and more. Consider using a more environmentally friendly product on snow and ice, such as sawdust, biodegradable/nature-based cat litter, eco-safe/salt-free commercial ice melters, and using sand sparingly. Use one of these products during the next ice or snow storm and help reduce your pollutive impact on the environment.

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
- Connie Ghosh** - Chemical, *E. coli* & Macro Monitoring in the Rubes Watershed
- Dunmovin Stream** - Chemical Monitoring in the Noonday Watershed
- ERM Atlanta** - Chemical Monitoring in the Chattahoochee Watershed
- Fairfax Consulting** - Chemical & *E. coli* Monitoring on Powder Springs Creek
- Keep Smyrna Beautiful AAS** - Chemical Monitoring in the Nickajack Watershed
- Keep Smyrna Beautiful AAS** - Chemical Monitoring in the Rottenwood Watershed
- Keheley ES 3rd Grade Target Class** - Chemical & Macro Monitoring in the Rubes Watershed
- John Keiler** - Chemical Monitoring in the Allatoona Watershed
- Lakewood Colony** - Chemical & *E. coli* Monitoring in the Rubes Watershed
- Simon Locke** - Chemical & *E. coli* Monitoring on Butler Creek
- The Ochala Family** - Chemical & *E. coli* Monitoring on Nickajack Creek
- Richard's Creek** - Chemical Monitoring in the Allatoona Watershed
- Sierra Club Centennial Group** - Chemical, *E. coli* & Macro Monitoring on Rottenwood Creek
- Village N. Highland Subdivision** - Chemical, *E. coli* & Macro Monitoring in the Willeo Watershed
- Walton HS AP Environmental Science Class** - Chemical Monitoring on Sope Creek
- Willeo Watershed Alliance of Loch Highland** - Chemical Monitoring in the Willeo Watershed

Thank you for your hard work and dedication!



2016 Georgia River of Words ART Winner

Ivey Epsy

Grade K

The Stonehaven School, Marietta

Teacher: Nancy Rodriguez

welc  me

Albert Chen

Chemical Monitoring in the Sewell Mill Watershed

KMHS Magnet Internship

Chemical & *E. coli* Monitoring in the Rubes Watershed

Leilani Johnson

Chemical Monitoring in the Olley Watershed

Nob Ridge-Fisher

Chemical Monitoring in the Noses Watershed

Saad Rahman

Chemical Monitoring in the Sewell Mill Watershed

Walton Citizen Science

Chemical Monitoring on the Chattahoochee - Gold Branch Watershed

ANNOUNCEMENTS

Welcome to the 2016-17 Chattahoochee Challenge Competitors!

- Campbell High School
- Dodgen Middle School
- Daughters of the American Revolution-Fielding Lewis Chapter
- Keep Smyrna Beautiful
- Lassiter High School
- Lovinggood Middle School
- North Cobb Christian School
- North Cobb High School
- Pope High School

We are excited to announce the schools, clubs, and community groups that are registered in our 2016-17 *Chattahoochee Challenge*. These groups are participating in numerous volunteer opportunities, including creek cleanups, storm drain marking projects, privet pulls, water quality monitoring, and community *Pick It Up* pet waste events. They are also coordinating their own activities that teach others about water quality and help protect Cobb County waterways.

The group that accumalates the most volunteer service hours by April 30th, will win a free rafting trip on the Chattahoochee River with National Park Ranger Jerry Hightower.

Best of luck to our competitors!

Quarterly Award Winners for Volunteer Service



Most Unusual Debris Found :

Kelsey Doe & Hannah Mone with the steel toy tractor they found in Rubes Creek at Sweat Mountain Park.



Most Debris Collected:

Ross Brewer with a purse that he found in Olley Creek at Fair Oaks Park.



Watershed Spirit Award:

Leilani Johnson with a truck tire she pulled from Olley Creek at Tramore Park.

**SAVE THE DATE!
ANNUAL WATERSHED STEWARDSHIP FAIR**

Thursday, March 30th
6:00 - 8:30 PM
Cobb County Water Quality Lab
662 South Cobb Drive, Marietta, Georgia 30060

Please join us on Thursday, March 30th, 2017, 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 watershed stewardship 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.

Refreshments will be provided. Please contact us at 770-528-1482 or water_rsvp@cobbcounty.org for more information and to RSVP.

Thank you Coca-Cola

For the eighth season, the Coca-Cola Marietta Bottling Plant generously donated empty food-grade drums to be used in the Watershed Stewardship Program's community *Rain Barrel Make & Take* program. During the free program, Cobb County residents recycle the donated barrels by turning them into rain water harvesting devices. From April through October, 7 workshops were held with over 100 participants and over 85 rain barrels made. The Cobb County Watershed Stewardship Program would like to thank Coca-Cola Marietta for their continued support and involvement in our community programs. Without this partnership, this program would not be possible.



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 15 • 10:00am – 12:00pm • 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.

RECOMMENDED RESOURCES

Bird Brains: The Intelligence of Crows, Ravens, Magpies, and Jays

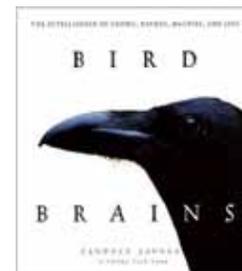
by Candace Savage

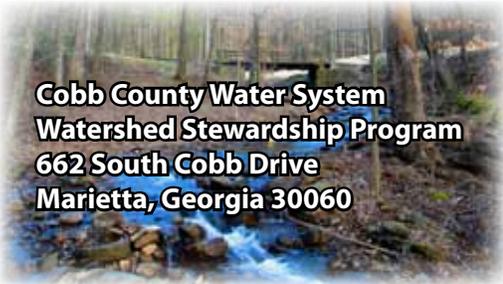
"Birds have long been viewed as the archetypal featherbrains—beautiful but dumb. But according to naturalist Candace Savage, "bird brain," as a pejorative expression, should be rendered obsolete by new research on the family of corvids: crows and their close relations.

The ancients who regarded these remarkable birds as oracles, bringers of wisdom, or agents of vengeance were on the right track, for corvids appear to have powers of abstraction, memory, and creativity that put them on a par with many mammals, even higher primates. Bird Brains presents these bright, brassy, and surprisingly colorful birds in a remarkable collection of full-color, close-up photographs by some two dozen of the world's best wildlife photographers.

Savage's lively, authoritative text describes the life and behavior of sixteen representative corvid species that inhabit North America and Europe. Drawing on recent research, she describes birds that recognize each other as individuals, call one another by "name," remember and relocate thousands of hidden food caches, engage in true teamwork and purposeful play, and generally exhibit an extraordinary degree of sophistication."

Source: <http://tinyurl.com/j7s4bao2&keywords=bird+brains>





**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

- 5 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 12 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 19 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 21 Adopt-A-Stream Macroinvertebrate Monitoring Workshop • 10:30am - 2:30pm • Cobb County Water Quality Laboratory
- 26 Homeschool Winter Science Series-Snakes of Cobb County • 10:00am - 12:00pm • Cobb County Water Quality Laboratory
- 28 Privet Pull • 10:00am-1:00pm • Big Shanty Park

February

- 2-4 Georgia Science Teachers Association Conference • Stone Mountain, GA • www.georgiascienceteacher.org
- 2 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 8 Adopt-A-Stream Chemical Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 9 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 15 Homeschool Winter Science Series-Frogs of Cobb County • 10:00am - 12:00pm • Cobb County Water Quality Laboratory
- 16 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 17-18 Georgia Organics Conference & Expo • Atlanta, GA • <http://conference.georgiaorganics.org/>
- 18 Privet Pull • 10:00am-1:00pm • Fair Oaks Park
- 23 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory

March

- 2 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 3-4 Environmental Education Alliance of GA Conference • Gwinnett Environmental & Heritage Center • Buford, GA • www.eealliance.org
- 9 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 14 Frog Monitoring Workshop • 6:00pm-9:00pm • Location TBD
- 15 Adopt-A-Stream Bacterial Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 15-25 Atlanta Science Festival • Atlanta, Georgia • www.atlantasciencefestival.org
- 16 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 23 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 24-25 Adopt-A-Stream Confluence • Gwinnett Environmental & Heritage Center • Buford, GA • www.georgiaadoptastream.org
- 28 Stewardship Mob Privet Pull • 5:00pm-7:00pm • Sweat Mountain Park
- 30 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 30 Watershed Stewardship Fair • 6:00pm - 8:30pm • 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.