



2006 Volunteer of the Year - Judy Cox

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Each year Cobb County recognizes an Adopt-A-Stream participant for their watershed stewardship work during the year. For 2006, Judy Cox was selected to receive this honor. Judy is an eighth grade, target, science teacher at Dodgen Middle School. Under her direction, our partnership with Dodgen Middle School has strengthened to become Cobb's most active AAS school. Over 80 students collect data each month.



GA AAS Advisory Board Member Bob Bourne recognizes Judy for her great work.

Judy has taken students outdoors to sample the school's pond for a number of years.

They set up several water quality monitoring sites around the property, and collect chemical data for Cobb County monthly. In the fall of 2006 every one of her students completed the training and testing to become QA/QC Volunteers. Once a month an entire class period is spent at Dodgen's pond sampling the water for dissolved oxygen, temperature, pH and visually monitoring the spread of an invasive weed, Parrot Feather. While this might not sound impressive to someone not familiar with middle school policies and 13 year old students, I assure you taking sets of 20 kids outside, by yourself, for an hour all day long (5 classes back-to-back) is no easy task. It takes a dedicated teacher to implement a project of this magnitude. Judy and her students were also recognized by GA Adopt-A-Stream for their excellence, receiving the 2006 Outreach Award. Thank you Judy.

Special points of interest:

- AAS Chemical and Biological Monitoring Workshops offered upon request
- Frog Monitoring Workshop: Learning to Listen on 5/10
- Teachers can earn 2 PLUs by attending our Cool Waters Workshop, 6/4-6/6

Frog Monitoring

Each spring the Water Quality Lab receives citizen calls asking about the health of the frog population and questioning why certain species that have always been heard vocalizing are no longer in the area. If you are concerned or have similar questions, we invite you to attend our May 10th program. Georgia Department of Natural Resources Herpetologist John Jensen will be sharing his knowledge about Georgia's frogs and their calling behaviors.



Cobb County is also looking for volunteers to collect frog vocalization data this season and to share their findings with the community. We will train at the May 10th workshop.

Mating Habits & Nest Construction of Common Stream Fish

by Adam Sukenick, Cobb County Stream Monitoring

With the arrival of spring, ecological factors such as warming temperatures and longer days signal breeding season for many fish species. Throughout the fish community mating rituals vary between species and are often quite impressive. Like most of the animal kingdom, it's the male fish that try to look their best. In order to attract a mate, a male fish will develop bright colors or build nests to make themselves more desirable to females. Additionally, the males of some fish species grow tubercles (boney material or horns) on the head, body and fins. For some, tubercles play a vital role in mating rituals and later for defending the eggs from predators. Successful males are selected for mating and the spawning ritual begins.

The Centrarchidae or sunfish family, which includes the popular Redbreast, Bluegill and Largemouth Bass, use nest building to attract a mate. Most sunfish construct a shallow, saucer like depression in the sediment along stream or lake margins. Using their fins to displace substrate (soft sand or gravel), males hollow out a nest and entice females in for breeding. While some species of sunfish prefer a more solitary nest near cover, others will congregate many nests in a larger area known as spawning beds. The mating ritual involves males and females circling around each other making some physical contact and then releasing eggs and sperm (milt) into the nest. The female then moves on and may mate again in another nest, however, the male will remain behind to guard the eggs until they develop. In some cases the male goes without feeding in order to protect and maintain the nest until the young are hatched.



These sunfish nests are commonly seen in Cobb streams each summer.

Although spawning techniques and nest construction vary by species, some aspects are considered universally important. One factor is developing eggs require oxygen and will be fatally injured if covered in fine sands and sediment. For this reason, many families of fish spawn over gravel beds in riffle areas of the stream. This method, used by



Bluehead chub carries pebble, Photo by William Roston

Note the tubercles present on the head of this male Chub.

Catostomidae (Sucker Fish) and Salmonidae (Trout) takes advantage of swift moving water to carry away sediments and provide oxygen while relying on the small spaces between stones to provide protection for the developing eggs. Before the ritual begins, individuals linger in pools or runs downstream of a riffle until they're ready to mate. Once positioned in the riffle (sometimes over a shallow nest in the gravel) a female is joined by two or more males. With the female in the middle, the males press against her body and rapidly gyrate or wiggle together. The contact from such aggressive motion causes the eggs to be released and fertilized by milt released from the males.

One industrious fish, the Chub, has a unique method for attracting females and protecting the eggs. While some fish will fan away fine sediments with their fins or push aside pebbles to create a shallow nest in gravel, several species of Chubs will search the stream bottom for small gravel they can use to build a circular mound or nest. Chubs will collect stones with their mouth one at a time

and transport them to an ideal location. Once the mating dance ensues and the eggs and milt are released, the Chub moves more and more stones to the mound. The same fish may mate again or may mate with another female. After each mate, pebbles are added to the nest and construction can continue until the mounds or nests are a few feet in diameter and a foot tall. Once established, the nests are also used by other minnow species. In a mating frenzy, eggs and sperm of other minnow species are deposited into the nest. It is believed that the abundance of activity around the nest circulates water through the spaces between the stones and aerates the fertilized eggs. With the mound as protection, neither the host species nor others utilizing the nest remain to watch over the eggs.

Just about every stream habitat is utilized by aquatic life and the communities that live in our streams are just as diverse as our human population. Whether it's in sediments along stream margins, in rock crevices, over gravel beds or under overhanging banks, sites for nesting are carefully selected before mating rituals begin. To ensure successful egg development, chosen nesting environments and stream substrates must remain clean and stable. By protecting habitat, preventing excessive sedimentation and eliminating negative impacts to stream quality today we can look forward to enjoying the colorful rituals of future aquatic generations.

Sources:

Fishes of Alabama; Boschung, Herbert T. and Mayden, Richard L.

Fishes of Tennessee; Etnier, David A. and Starnes, Wayne C.

Species & Number of Fish Identified by Cobb County Water System 1999, 2001, 2003, 2004

C = Chattahoochee Watershed and E = Etowah Watershed

TAXONOMY	C	E
ORDER PETROMYZONTIFORMES		
FAMILY PETROMYZONTIDAE (LAMPREYS)		
Ichthyomyzon gagei southern brook lamprey	0	11
ORDER AMIIFORMES		
FAMILY AMIIDAE (BOWFINS)		
Amia calva bowfin	2	0
ORDER CYPRINIFORMES		
FAMILY CYPRINIDAE (MINNOWS)		
Campostoma oligolepus largescale stoneroller	0	519
Campostoma pauciradii bluefin stoneroller	166	0
Carassius auratus goldfish	1	0
Cyprinella callistia alabama shiner	0	13
Cyprinella lutrensis red shiner	140	0
Cyprinella venusta blacktail shiner	1	24
Cyprinus carpio common carp	0	6
Ericymba buccata silverjaw minnow	41	0
Hybopsis sp. coastal chub	15	0
Luxilus zonistius bandfin shiner	253	6
Nocomis leptcephalus bluehead chub	228	4
Notropis chrosomus rainbow shiner	0	20
Notemigonus crysoleucas golden shiner	4	1
Notropis longirostris longnose shiner	225	0
Notropis lutipinnis yellowfin shiner	253	0
Notropis stilbius silverstripe shiner	0	40
Notropis xaenoccephalus coosa shiner	0	44
Pimephales sp.	1	0
Pimephales vigilax bullhead minnow	0	7
Semotilus atromaculatus creek chub	139	229
Semotilus thoreaulianus dixie chub	16	0
FAMILY CATOSTOMIDAE (SUCKERS)		
Catostomus commersoni white sucker	95	0
Hypentelium etowanum Alabama hog sucker	151	199
Minytrema melanops spotted sucker	2	0
Moxostoma duquesnei black redbhorse	0	2
Moxostoma poecilurum blacktail redbhorse	0	4
Scartomyzon lachneri greater jumprock	7	0
ORDER SALMONIFORMES		
FAMILY ESOCIDAE (PIKES)		
Esox niger chain pickerel	1	0

TAXONOMY (continued)	C	E
ORDER SILURIFORMES		
FAMILY ICTALURIDAE (BULLHEAD CATFISHES)		
Ameiurus brunneus snail bullhead	19	0
Ameiurus melas black bullhead	7	0
Ameiurus natalis yellow bullhead	84	3
Ameiurus nebulosus brown bullhead	4	31
Ameiurus serracanthus spotted bullhead	0	0
Ictalurus punctatus channel catfish	0	23
Noturus leptacanthus speckled madtom	5	0
Pyloodictis olivaris flathead catfish	0	5
ORDER CYPRINODONTIFORMES		
FAMILY FUNDULIDAE (TOPMINNOWS)		
Fundulus stellifer southern studfish	31	114
FAMILY POECILIIDAE (LIVEBEARERS)		
Gambusia holbrooki eastern mosquitofish	34	9
ORDER SCORPAENIFORMES		
FAMILY COTTIDAE (SCULPINS)		
Cottus carolinae banded sculpin	26	92
ORDER PERCIFORMES		
FAMILY CENTRARCHIDAE (SUNFISHES)		
Lepomis auritus redbreast sunfish	510	521
L. cyanellus green sunfish	299	730
L. gulosus warmouth	7	7
L. macrochirus bluegill	773	677
L. microlophus redear sunfish	9	8
L. punctatus spotted sunfish	0	3
L. auritus X cyanellus hybrid sunfish	10	13
L. auritus X macrochirus hybrid sunfish	1	2
L. macrochirus X microlophus hybrid sunfish	3	0
Micropterus punctulatus spotted bass	3	101
Micropterus salmoides largemouth bass	46	89
Micropterus coosae shoal bass	10	35
Pomoxis nigromaculatus black crappie	2	3
FAMILY PERCIDAE (PERCHES AND DARTERS)		
Etheostoma scotti cherokee darter	0	30
Etheostoma stigmaeum speckled darter	0	1
Perca flavescens yellow perch	0	2
Percina kathae Mobile logperch	0	25
Percina nigrofasciata blackbanded darter	400	120
Percina palmaris bronze darter	0	2

Biodiversity Spotlight: Cope's Grey Treefrog

by Erin Feichtner, Cobb County Stream Monitoring

Classification and Nomenclature: Frogs, toads, and salamanders belong to the Class Amphibia, which means “dual life” in Greek. This refers to the aquatic (water obligate) tadpole stage and terrestrial (land-dwelling) adult stage of the amphibian life cycle. All frogs and toads belong to the Order Anura; in the Greek language an, without, and ura, a tail, refers to their tailless condition. Treefrogs, such as the Cope's Gray Treefrog, *Hyla chrysoscelis*, belong to the Family Hylidae and are long-legged and arboreal. The genus name comes from the Greek hyla, belonging to the woods. The species name combines the Greek chryso (gold) and kelis (a spot). This may refer either to the spot under the eye or the orange spotting on the inner thigh

Biology: Cope's Gray Treefrogs are small to medium sized frogs reaching lengths of about 2 inches. Skin may be a solid shade of gray or green or nearly white, or may have well defined dark gray or black blotches on the back. Like many frogs, the Cope's Gray Treefrog may change color, depending on environmental factors such as light levels, temperature, moisture, stress, or level of activity. There may be a light spot ringed with dark color under the eye. The inside of the thigh is yellow to bright orange. The back leg must be extended to see this characteristic.

Cope's Gray Treefrog is a nocturnal frog, meaning it is active at night. It is difficult to find because it spends much of its time up in trees and its color camouflages it well against tree trunks. The treefrog is also characterized by having large discs on the ends of its digits allowing it to cling to vertical surfaces. It is found in a variety of habitats where there is shallow water and an abundance of vegetation, including roadside ditches, ponds, and forested wetlands with standing water. An opportunistic feeder which eats whenever food is available, it consumes mostly insects and other small invertebrates. All amphibians are cold-blooded, meaning their body temperature is strongly influenced by the temperature of the surrounding environment. An amphibian must change its body position or location in order to keep from becoming too hot or cold. Amphibians transport water and air primarily through their skin rather than stomach and lungs. Regardless of life history pattern, amphibians remain obligated to moisture throughout their lives.



Life Cycle and Natural History: The Cope's Gray Treefrog starts breeding early and ends late in the year. Eggs are deposited as early as March, and breeding continues through August. Small clutches of up to 80 eggs are laid. Several egg masses may be laid during a breeding season. Eggs hatch in one to two weeks. Tadpoles undergo metamorphosis, gradually losing their tail and transforming to a terrestrial adult one to two months after hatching.



Only one species of Treefrog has been found in Cobb:
Cope's Grey (pictured here).

Conservation Status: Amphibian populations worldwide have been adversely affected by a number of factors including habitat destruction, alteration and fragmentation, chemical contaminants, UV-B radiation, invasive species, and disease. Due to their amphibious lifestyles and permeable eggs and skin, amphibians are very sensitive to changes in the water and surrounding land.

Practices that clear water of vegetation or drain wetlands affect this species adversely. Small and isolated vernal pools, a type of ephemeral wetland, are an important amphibian habitat that dries seasonally. A yearly dry period leaves a fish-free environment for amphibians, many of which have adapted rapid egg and larval stages to complete development before the water evaporates and the wetland disappears in the dry season.

Chemical stressors, such as pesticides, heavy metals, acidification, nitrogen based fertilizers, and endocrine disrupting chemicals, can cause death, decreased growth rates, developmental and behavioral abnormalities, decreased reproductive success, weakened immune systems and hermaphroditism in amphibians. Chemical pollutants can impair an amphibian's ability to swim, catch food, and reproduce successfully. Levels of UV-B radiation in the atmosphere have risen significantly over the past few decades. Researchers have found that UV-B radiation can kill amphibians directly, cause sublethal effects such as slowed growth rates and immune dysfunction and work synergistically with contaminants, pathogens and climate change.

Invasive species pose a constant threat to native amphibians. Invasive plants and animals can alter the ecological community that is relied upon by native amphibians. Releasing exotic pets into the environment may introduce harmful pathogens and parasites, increase competition with native species for resources, cause predation on native species, and possibly degradation of the native species gene pool.

Chytridiomycosis is an infectious disease that affects amphibians worldwide. It is caused by the chytrid fungus (*Batrachochytrium dendrobatidis*), a fungus capable of causing sporadic deaths in some amphibian populations and 100% mortality in others. The disease has been implicated in the mass die-offs and species extinctions of frogs in the past 15 years, but its origin and its true impact on populations remain uncertain and are under investigation.

Cope's Gray Treefrog and You: Unless your idea of a relaxing summer evening is walking around a wetland searching tree trunks and branches, it is quite likely you will never encounter a Cope's Gray Treefrog. But you likely might hear one call from his perch. You can hear the call at <http://www.uga.edu/srelherp/anurans/hylchr.htm>. If you do happen to come across any amphibians in your adventure, please be mindful of their permeable skin. You will not want to touch them if you have recently applied sunscreen or bug spray. Happy frog hunting!

Sources:

Partners in Amphibian and Reptile Conservation <http://www.parcplace.org/index.html>

UGA Savannah River Ecology Laboratory Herpetology Program <http://www.uga.edu/srelherp/>

USGS Northern Prairie Wildlife Research Center Online <http://www.npwrc.usgs.gov/>

Site of the Season: Allatoona Creek at County Line Road

On March 16th, Frey Elementary 4th Graders came across an alarming site while monitoring the water quality in the stream behind the school. Dozens of very large dead and dying fish were spotted in both a small tributary and the main channel of Allatoona Creek. Students from Darniele Scarpinato, Ann Driver and Gary Jordan's classes were very concerned and reported the situation to the Water Quality Lab. The investigators sent to assess the situation reported that although there was a large die-off of one fish species, several other species of fish were seen in the creek and appeared healthy and the water quality levels were normal. They found no evidence of a sewage or other pollutants. So what was going on in Allatoona Creek?

The Water Quality Lab notified the Georgia Department of Natural Resources (DNR) who sent out staff from their Fisheries Team to investigate. They identified the fish as a White Sucker, *Minytrema melanops* and attributed the die-off to spawning behavior. We also consulted with fish expert Dr. Bill Ensign from Kennesaw State University. He reported, "this is spawning season and they (the fish) do move up out of larger water bodies (both lakes and rivers) into smaller streams to spawn. It is not uncommon to see dead and/or dying individuals at this time of year...although seeing that many large fish in a small stream keeling over is initially disturbing, I don't think it's unusual given the species, location and time of year." Thank you to both Dr. Ensign and GA DNR for your speedy response to the situation. And thank you Frey 4th graders for reporting it to Cobb Water.



Over 75 White Suckers were recorded on 3/17. This individual, typical of those found, was 17" in length.

If you should happen across a fish kill (or a sewer spill), report the location to Cobb County Water System ASAP for immediate investigation through our 24-hour dispatch 770-419-6201.

Schedule of Events

Frog Monitoring Workshop: Learning to Listen

Date: Thursday, May 10th
Time: 8:00 pm - 10:00 pm
Location: Nicholson Elementary
Cost: Free

Cobb County Master Gardener's Annual Garden Tour

Date: Saturday, May 12th
Time: 10:00 am - 5:00 pm
Location: Water Quality Lab
Cost: \$10.00 in advance
Call: 770-528-4070

River Rendezvous: Rottenwood Watershed

Date: Saturday, May 19th
Time: 8:30 am - 1:00 pm
Location: Water Quality Lab
Cost: Free

May 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
	National Drinking Water Week			Frog Workshop		Garden Tour
13	14	15	16	17	18	19
						River Rendezvous
20	21	22	23	24	25	26
27	28	29	30	31		
	Holiday 					AAS Workshops upon request

Welcome to Adopt-A-Stream

Vicki Yeh, Environmental Programs Specialist



Vicki joins Cobb County Water System on May 7th.

As many of you know we've had a vacancy in our program since last summer. Thank you for your patience these last months. We are pleased to announce that we have recently hired an educator to work with our Watershed Stewards. **Vicki Yeh** is coming to Cobb Water from Georgia's Environmental Protection Division where she has been working in the state's Outreach Unit for the past year. Her prior experience with Adopt-A-Stream and Project WET will allow her to immediately step in and assist with volunteer training and presentations.

Vicki is a 2003 graduate of the University of Georgia's School of Forestry Resources with a degree in Wildlife. She has worked as an educator and naturalist for the Blue Ridge Outdoor Education Center and Elachee Nature Center as well as completing an internship with Gwinnett County's Adopt-A-Stream Program. While at Blue Ridge Outdoor Education Center Vicki also worked as their Nature Center's Curator, caring for reptiles (including venomous and non-venomous snakes), amphibians and mammals. Vicki brings with her a wealth of skills and experiences that will serve to strengthen our program and allow for greater involvement from the county in your stewardship activities.

We are excited to be working with Vicki and welcome her to the Cobb County Water Quality Laboratory staff.

June 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2 National River Cleanup Week
3	4 Cool Waters <small>A Water Workshop for Georgia Educators</small>	5	6	7 Seed Workshop	8	9 Back to the Chattahoochee
10	11	12	13	14	15	16 Rottenwood Cleanup
17	18	19	20	21	22	23
24	25	26	27	28	29	30
The Great North American Secchi Dip-In - contact Cobb AAS if you'd like to participate						

Schedule of Events

Cool Waters Educator Workshop

Date: June 4th-6th
 Time: 9:00 am - 4:00 pm
 Location: Water Quality Lab
 Cost: \$25.00
www.gawp.org

Seed Propagation Workshop

Date: Thursday, June 7th
 Time: 7:00 pm - 8:30 pm
 Location: Water Quality Lab
 Cost: Free

Back to the Chattahoochee River Race and Festival

Date: Saturday, June 9th
 Time: 9:00 am - 2:00 pm
 Location: Roswell, GA
 Riverside Park
 Cost: see website
www.ucriverkeeper.org

Sierra Club Stream Cleanup: Rottenwood Creak

Date: Saturday, June 16th
 Time: 9:00 am - 12:00 pm
 Location: NPS - Paces Mill
 Cost: Free

Recommended Reading

***Watersheds: A Practical Handbook for Healthy Water* by Clive Dobson and Gregor Beck**

"Water is our most vital resource. Yet few understand even the basics of watershed ecology. *Watersheds: A Practical Handbook for Healthy Water* provides a fascinating overview of the fundamentals of ecology from the simple concept of a watershed to the biological intricacies of a wetland ecosystem and its implications on the environment. More than 100 illustrations, especially done for this book, help explain the numerous environmental issues and the intricate web of life that connect each of us to all other life on the planet through our involvement in the watershed cycle. *Watersheds* includes information on: water and nutrient cycles, bioregions and aquatic habitats, exotic species invasions, water and air pollution, ecological restoration, and habitat loss.

Special 'How Can I Help?' sections throughout the book provide practical and meaningful ways in which individuals can make a difference to the health of watersheds by reducing water and air pollution, preserving native forests, and helping restore the health of streams and rivers."

"*Watersheds* is perhaps the only approachable introduction to environmental issues viewed through the ecology of the watershed...written in an engaging style, this book helps students and adults gain a better understanding of water and helps us learn about practical ways to protect this critical resource through maintenance of the watershed."

Book review from www.Powells.com



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Cobb County...Expect the Best!



River Rendezvous

Rottenwood Creek's headwaters are in the heart of Marietta, winding through Life College and under Hwy 41. This stream also receives drainage from Dobbins ARB.



Rottenwood Creek at Akers Mill Road

What is a River Rendezvous? It is a one-day surface water sampling event. Teams collect water samples and data from all over a watershed on the same day. This provides a complete watershed-wide snapshot of the state of the stream. This spring, Cobb's Sierra Club Stream Stewards have partnered with Cobb County Water System to expand their usual monthly data collection at three sites and organize an entire day of watershed sampling for Rottenwood Creek on May 19th.

Rottenwood Creek winds through Cobb County for nearly six miles before it enters the Chattahoochee River at the Palisades Area of the Chattahoochee National Recreation Area. At its headwaters, Rottenwood is a mere trickle, but by the time it ends, Rottenwood is about 40' wide and 4-5' deep. Our goal is to collect data from 30 sites across the drainage area. This data collection opportunity is supported by Cobb's Water Quality Lab. The Lab has agreed to supplement the standard volunteer collected data of temperature, dissolved oxygen and pH by completing additional analysis on the volunteer collected surface water samples from each site. Although this type of project has been done in Georgia, Cobb County has never had an event like this.

Each of the 30 sites will be assigned to one of ten sampling teams, with each team visiting three sites. A certified GA Adopt-A-Stream Chemical Monitoring Volunteer will act as a team leader for each sampling team to see that sampling is representative and done properly, following established protocols to ensure accurate data collection. If you are interested in participating in this project, contact Sierra Club's representative Didi Johnson at didij@bellsouth.net.