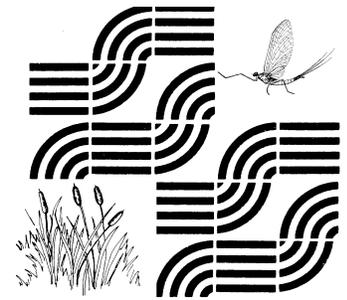


GEORGIA

Adopt-A-Stream

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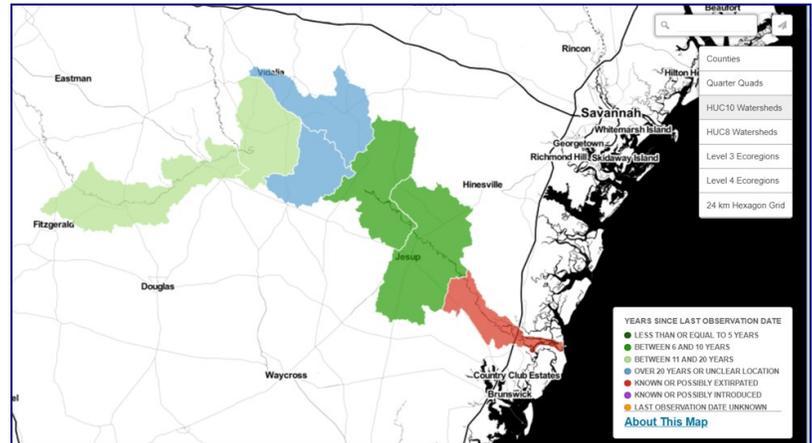


Department of Natural Resources
Environmental Protection Division

Aquatic Diversity Featured on Georgia Biodiversity Portal

by Brett Albanese, Wildlife Resources Division, Program Manager

You may know that Georgia ranks among the top 5 states in the nation for the diversity of freshwater fishes, crayfishes and mussels, but how can you learn more about these species? Before you head to your Adopt-A-Stream monitoring site, you should check out the Georgia Biodiversity Portal <https://georgiabiodiversity.org/>. The portal features photographs, species profiles and range maps for over 1,500 plants, animals and natural communities that are monitored by Georgia Department of Natural Resources' (DNR) Wildlife Conservation Section. The portal displays on a standard computer screen or your smart phone.



Current range of the Altamaha spiny mussel (Elliptio spinosa). Colors indicate the most recent observation within each watershed.

Source: <https://georgiabiodiversity.org/>

You can search the portal in three ways: by geographic location, by taxonomic group or by individual species or common name. Let's try it!

Enter "Altamaha" in the "Search for Individual Elements" box and select "Altamaha spiny mussel." You will be directed to a species profile page that includes a photograph and summarizes information on its identification, life history and conservation status. You will learn that this federally endangered species is endemic to the Altamaha river system and restricted to large rivers where it is typically buried in sandy habitats. If you click on the range map link, you will see that this species has not been detected anywhere within the past 5 years, with the majority of records more than 10 years old. Try clicking the quarter quad button to display the data at a finer spatial scale. Any way you look at it, this species has a small range and appears to be disappearing. We are currently planning surveys to try to document extant populations.



A Snail Darter (Percina tanasi) that was recently captured and released in South Chickamauga Creek, where the species population is rebounding. Photo by Brett Albanese, Georgia DNR.

you will see that the U.S. Fish and Wildlife Service currently recognizes 9 fish species in Georgia that are protected under the U.S. Endangered Species Act. You may be surprised that this list includes the Snail Darter, once famous, or infamous depending on your perspective, for delaying the completion of the Tellico Dam in Tennessee. Snail Darters were discovered in South Chickamauga Creek in Georgia in the 1980s. Working with our partners at the Tennessee Aquarium, we have documented a very large increase in this population since 2010. So things are looking much better for the Snail Darter than the Altamaha spiny mussel.

Speaking of conservation status, you might be interested in the conservation status of an entire group of species. If you click on "Natural Elements by List," you then have a choice of clicking on different taxonomic groups of species such as plants, birds or fishes. Let's try it! If you click on fishes, a list of 73 species that are monitored by our program is displayed, with links to maps, species profiles and other helpful information. Keep in mind that there are 265 native freshwater fishes documented in Georgia, but the portal only includes species of conservation concern. If you click the customize button, you can choose to display certain fields or subsets of species. For example, if you click the "With federal protection status in Georgia" button,

Aquatic Diversity Featured on Georgia Biodiversity Portal Continued...

While some people are fish nuts or crazy about mudbugs (aka crayfishes), most people have a broad interest in biological diversity. If you wanted to learn about all of the rare species in your local watershed, you can click on “Natural Elements by Location” and then click on the HUC 10 watershed icon. Let’s try it! Since you may not know which watershed to click on, just enter any geographic place in the search bar in the upper corner of the website. Entering Ellijay, GA (make sure you include the state) zooms you to this mountain town and a whopping list of 35 plants, animals and natural communities recorded in the Ellijay River watershed. This includes the Beautiful Crayfish (*Cambarus speciosus*) which is true to its name. This crayfish is endemic to the Coosawattee River system and is protected under Georgia’s Endangered Wildlife Act. Did you know that female crayfish are referred to as “in berry” when they are carrying eggs attached to their abdomen? After hatching, the juvenile crayfish stay attached to their mother’s abdomen by a thread until they complete their second molt.



The Beautiful Crayfish (Cambarus speciosus). Photo by Chris Lukhaup. Does this picture just make you want to adopt a stream?

How cool is that?

Please bookmark the portal and check back often. We are constantly updating our species distribution records that are displayed on the range maps. We are also updating and expanding profiles for all species that are federally listed, state listed or recognized as a high priority under [Georgia’s State Wildlife Action Plan](#). Finally, we are working with Georgia’s leading crayfish expert to integrate the now defunct Crayfishes of Georgia website into the data portal. This will broaden the portal beyond rare species and allow citizens the information needed to identify any crayfish species in our state.

Iron Bacteria



When it comes to bacteria, *E. coli* is not the only subgroup we should be thinking about. We should also be aware of iron bacteria. While harmless from a human health perspective, it’s important that we understand what iron bacteria is as it will help us to make accurate observations while collecting data on our adopted waterways.

What are iron bacteria? This group of long, thread-like bacteria are found naturally in water and soil and “bloom” when oxygen, water and iron combine. They get their name from the fact that they “feed” on iron. More accurately, they obtain energy from a chemical reaction called oxidation in which they change ferrous iron (Fe^{2+}) found in the environment into ferric iron (Fe^{3+}). Ferric iron is insoluble, meaning it won’t dissolve in water and therefore settles out as a precipitate.

What does it look like? The precipitate resulting from the oxidation reaction is a rust-colored, “fuzzy” or “feathery” deposit found on the bottom of the streambed. It is often accompanied by a metallic-appearing film on the water’s surface that is created from decomposing bacteria cells. It can look very similar to the petroleum sheen from an oil spill, but can be distinguished by breaking the oily layer up with a stick. Sheens caused from iron bacteria will break up into geometric fragments when disturbed, whereas an oil spill will swirl back into place. You may also notice a “swampy” or “musty” odor.

Where will you find it? Iron bacteria is generally found in slow moving water or pond areas and is associated with acidic soils and clay. It can also be enhanced by iron in surface runoff. Blooms may be especially evident after heavy rains, when iron leaches from the soil. If you find iron bacteria in your adopted waterway, be sure to mark it on the observations section of your data sheet. Please feel free to contact your local Community Coordinator or the State Office if you need any help distinguishing whether an oily sheen is caused by iron bacteria or a contaminant.

Fall Float on the Flint



Georgia Adopt-A-Stream partnered with Georgia River Network to provide outreach and monitor the Flint River for a fourth time during the Paddle Georgia Fall Float on the Flint paddle trip on October 6 -8. Adopt-A-Stream (AAS) staff and volunteers sampled 10 mainstem sites, 3 tributary sites, 6 spring sites and 2 additional sites of interest, resulting in 21 sampling sites in total. Samples were tested for AAS core chemical parameters (water temperature, pH, dissolved oxygen and conductivity) as well as nutrients and *E.coli* bacterial levels. In addition, water samples were collected and transferred to the J.W. Jones Ecological Research Center in Newton for processing and comparative analysis. AAS staff conducted outreach throughout the trip by providing demonstrations and answering questions while out in the field, as well as announcing sampling results to participants each evening.

A summary of the trip's sampling results can be seen in the adjacent chart. Complete results are available from the AAS State Office upon request. On this trip, the water quality data was found to be generally good and consistent with data collected at the same sites in years past. Nitrate levels were higher in the springs than in the mainstem, although this is not unusual for the area. For analysis of previous Fall Float data and a more detailed description of general water quality results on the lower Flint River, please see the [October – December 2015 AAS Newsletter](#) on the AAS website.

Fall Float on the Flint 2018: (Min-Max)			
Parameter (Unit)	Mainstem	Tributary	Spring
Air Temp. (°C)	22.00-29.00	21.40-27.70	25.00-28.50
Water Temp. (°C)	24.50-26.50	18.80-23.70	20.00-21.50
pH	7.00-7.50	7.00-7.25	6.75-7.50
Dissolved Oxygen (mg/L)	5.00-6.60	1.90-8.05	2.60-6.40
Conductivity (µS/cm)	160-200	180-320	250-340
<i>E. coli</i> (cfu/100mL)	0.00-66.70	0.00-200.00	0.00-0.00
Nitrates (ppm)	0.00-1.50	1.50-4.25	2.50-9.00
Total Sites Sampled	10	3	6

Fed by aquifers and clear spring pools, the Flint is home to some of Georgia's most amazing biodiversity. Some noteworthy characteristics of the Flint River are its limestone bluffs, icy blue hole springs and an engulfment of sycamore and cypress trees along the river corridors. This stretch of the Flint is truly a hidden gem in Georgia and we encourage you all to get out there and show your Georgia rivers some love. Lastly, we would like to thank Paddle Georgia, AAS trainers, volunteers and the monitoring team for another great trip!

Rivers Alive Cleanups and T-shirts!



Georgia Department of Natural Resources Presents...

20 YEAR REUNION TOUR 2018

RIVERS ALIVE

Take Me To The River

Georgia's 70,000 miles of rivers and streams need your help! Our waterways provide us with fresh air, scenic views, recreational activities and important habitat for other animals.

Join us at
RiversAlive.Georgia.gov

Our mission is to create awareness of and involvement in the protection of Georgia's water resources through voluntary cleanups.

Did You Know?

Trash has been found all over the world, from the surface of the ocean to Arctic ice and even in the Mariana Trench, the deepest part of the ocean. Much of that trash is plastic, and most plastic trash comes from items we use every day. Trash floats on the water. Trash floats on the land can be washed into rivers, streams, and marshes eventually, and up to the ocean. There and along the way, the debris can become a safety hazard for humans and a problem for wildlife who mistake it for food or become tangled in it.

See some items below about common sources of single-use plastics and what you can do to help!

Enough **STRAW AND STIRRERS** are found in one day to line the entire coast of California! Try saying "no thank you" when someone offers you a straw or buying a reusable one made from bamboo, metal, or reusable plastic.

CANOEY BAGS are recyclable, but they can't be included with the rest of your plastic curbside items. Many grocery stores have special containers near the entrance to recycle this type of plastic. Try keeping reusable shopping bags in your car so you have them wherever you go to the grocery store.

FRIBS CUPS and **INSULATED CONTAINERS** are actually a type of plastic called polycarbonate. It's used to make everything from roofs to egg cartons to packing peanuts. Try bringing a cup for drinks or food storage containers for leftovers from home. Many businesses will allow you to use your own as long as they are clean and dry.

RIVERS ALIVE
Georgia's Own Waterway Cleanup

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Thanks to the efforts of all organizers and volunteers, Rivers Alive had another successful year of statewide cleanups. Over the span of **232 events**, upwards of **23,600 volunteers** each donated an average of **3.5 hours** of their time and cleaned more than **900 miles** of Georgia's waterways! In addition to removing trash, these cleanups have helped to educate people across the state about water quality issues.

If you held a cleanup this fall, please submit your final tally as soon as possible so we can finalize our yearly report!

In addition, if you did not receive education materials such as posters and bookmarks and would like some, please get in touch. Send the quantity you would like of each, along with your preferred mailing address to Rivers.Alive@dnr.ga.gov.

Water Trails in Georgia

by Gwyneth Moody, Georgia River Network, Director of Programs and Outreach

With miles of rivers, lakes and coastline to explore, Georgia is increasingly becoming a 'destination' for many water recreationalists. This trend has been gaining momentum largely as a result of the increased network of Georgia Water Trails.

A water trail is similar to a hiking trail but on a waterway with safe public access points, information kiosks and signage, and family friendly amenities such as picnic areas and facilities along the route.

Georgia River Network (GRN), a statewide nonprofit organization, requires that a water trail fulfill six criteria to be considered "established" and part of the Georgia Water Trails Network. There are currently 16 established and 18 developing water trails in Georgia.

Water trails have many benefits for relatively little investment, and they can help diversify local economies.

Georgia River Network has been assisting communities throughout the state in the development of water trails as a way to boost economic development, bring in tourism and increase recreational opportunities. People come to an area to explore a water trail and spend money in restaurants, coffee shops, hotels and gas stations, all of which benefits the community.

Georgia River Network's Water Trails Technical Assistance Program helps communities form comprehensive water trail stakeholder partnerships as well as providing them with guidance and resources to begin developing a sustainable water trail.

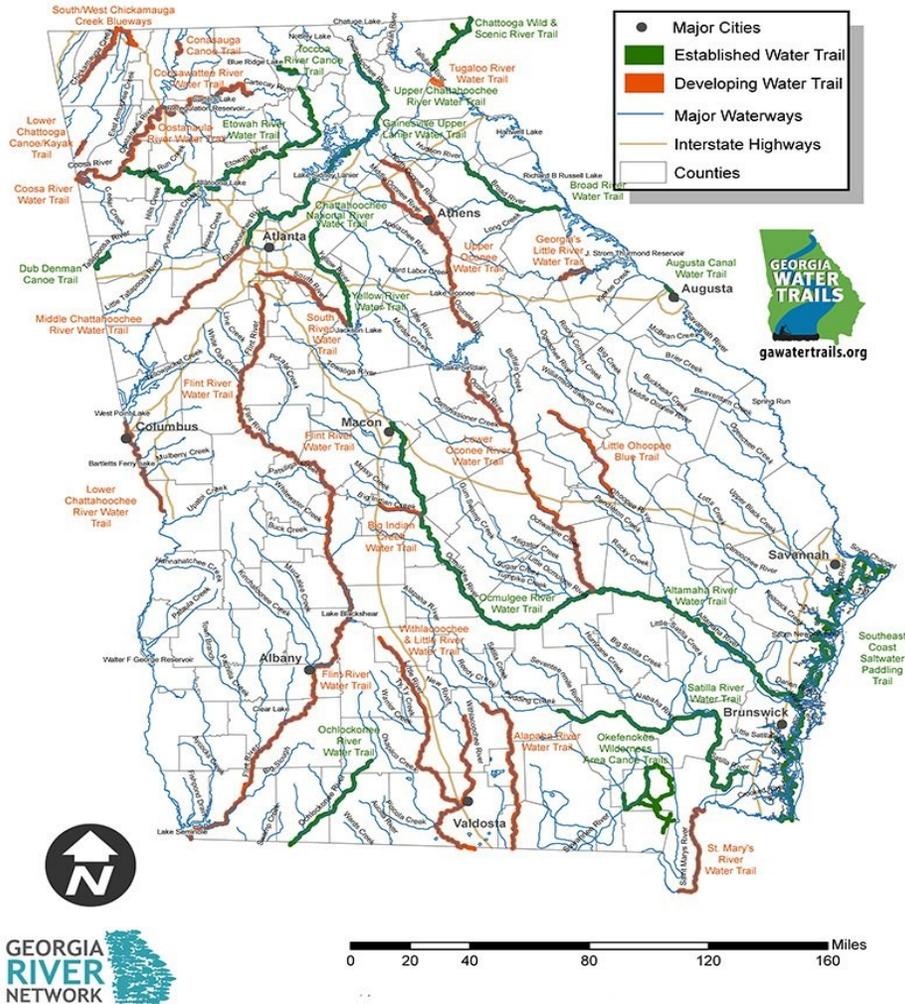
Stakeholders are generally comprised of volunteers and local entities, typically businesses, watershed groups and city/county government. Governments are natural partners because their employees interact with waterways via water and sewer services, riverside parks, police, fire and emergency medical services.

Georgia River Network has six criteria that a community must meet in order to have their part of the river designated a water trail:

- There has to be a put in and a take out
- Proper signage, with maps
- Safety information and distance to the next take-out point
- A website
- Parking
- A group dedicated to maintaining the trail to ensure that it doesn't become dilapidated and unsafe.

Of course the ultimate goal for Georgia River Network is to introduce people to river issues and to engage them in the protection of their local waterways. GRN doesn't just help establish a water trail and then abandon ship. Instead we offer an extensive toolkit of resources on our website and partner to offer day paddles along different water trails, as well as our signature event – Paddle Georgia – a weeklong paddling/camping/educational trip for families on a different Georgia river every year.

Learn more on our new website GaRivers.org!



Board Member Highlight: Steve Blackburn, EPA Region 4

Steve Blackburn's love of nature was instilled at an early age as a military dependent. His father's assignments allowed Steve to explore the jungles of Panama, the Appalachian Mountains and Florida's clear springs, lakes and rivers. His major discoveries during this time include love of snorkeling and canoeing, fear of heights and that alligators can run really fast. Inspired by the travel bug and listening to the Beatles' Yellow Submarine, Steve joined the US Navy serving on the fast attack submarine USS Narwhal deployed in the Mediterranean. After years of living underwater and realizing that submarines have no windows, Steve headed to the surface to attend Florida State University where he completed his master's degree in oceanography.



After a brief stint working on fisheries in the Aleutian Islands, Steve accepted a job at the U.S. Environmental Protection Agency (EPA) in Atlanta, GA, and that's where he's been for twenty-five years. His duties at EPA include Water Quality Protection Program Manager for the Florida Keys National Marine Sanctuary and serving as the Regional Citizen Monitoring Coordinator. Steve participated in the early development of the Georgia Adopt-A-Stream and Alabama Water Watch programs and strongly advocates for citizen scientist/volunteer monitoring programs within EPA and outside the agency. He has championed and worked with citizens, universities, environmental groups, local government and state/federal agencies to advance citizen monitoring programs in the southeastern United States.

As an AAS Board member since 1999, he has observed the strength, growth and influence of the nationally recognized Georgia AAS program. During this period, the AAS program developed a user-friendly database, implemented bacteria monitoring, refined the lake monitoring manual, created the Confluence conference, partnered with Georgia River Network's Paddle Georgia and inspired the creation of the South Carolina Adopt-A-Stream and Florida Keys Water Watch programs. Steve believes that citizen monitoring programs, such as GA AAS, provide the education, involvement, water data and a connectedness to the environment necessary for watershed restoration and protection.

Steve looks forward to participating in the AAS Board meetings and catching up with old, and new, friends. He values the camaraderie, knowledge and experience in the room and has called upon board members for their assistance on issues outside of AAS. If you see Steve on a river, he will often be accompanied by his daughter Cate who was certified by AAS on the Flint River Paddle Georgia and has since adopted her own site on Wolfpack Creek in Decatur, GA.

Don't Forget to Enter Your AAS Data for 2018!



A new year is here, which means it's time to finish submitting all of your data from your 2018 monitoring events! This helps us to accurately document our statewide contributions and the effectiveness of the Georgia Adopt-A-Stream program as we compile our annual reports. In 2019, we encourage you to make a resolution to enter your data as soon as possible after you monitor! Also, check out the graphs to see seasonal and long-term changes and trends at your site! Please contact us with any questions.

Also, please continue to send your database questions or concerns to AAS@gaepd.org

Please include as many details as possible such as your group and site name, the date of the issue, screenshots and a description of what you are experiencing. Also, please let us know which browser you are using. We will work as quickly as possible to respond to your issues and questions. Thank you so much for all of your hard work and dedication to protecting our waterways!

The preparation of the Georgia Adopt-A-Stream quarterly newsletter is financed in part through a grant from the US Environmental Protection Agency under provisions of Section 319(h) of the Federal Clean Water Act of 1987, as amended. For more information about the Georgia Adopt-A-Stream program or to contribute to the newsletter, contact:

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GO BLUE!

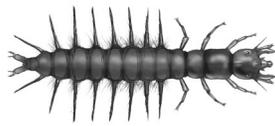
Sign up for our e-newsletter
by emailing us at
AAS@dnr.ga.gov



Dragonfly



Riffle Beetle



Dobsonfly



Stonefly



Net Spinning Caddisfly

Confluence 2019: March 22-24 Adopt-A-Stream Annual Conference



Friday Evening: Water Science Poster Session and Social featuring
Water Themed Trivia

Saturday: Water Quality Workshops, Exhibits and Awards Ceremony

Sunday: Special Water Quality Activities

And- Kid Sessions for K-5th grade! Opportunities for indoor and outdoor learning. Live animals, stream stompin' and more!

Keynote Speaker: Dr. Anna George, Vice President of Conservation Science and Education, Tennessee Aquarium

Unicoi State Park and Lodge in Helen, GA

~~Registration Opens in February 2019~~

For more information, visit the Confluence page at

AdoptAStream.Georgia.gov

