



CATT

Fiscal Year 2016 Report

USDA Forest Service
Southern Research Station
Center for Aquatic Technology Transfer (CATT)

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<http://www.srs.fs.usda.gov/catt>

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Frequently Asked Questions

What is CATT?

The Center for Aquatic Technology Transfer (CATT) is a science delivery program. CATT biologists and technicians are Southern Research Station (SRS) employees funded by the National Forest System (NFS) and other partners. Guided by core values of communication, partnership, inclusion, accountability, and safety, we collaborate with the Forest Service science community and others to develop custom solutions for our project partners.

When was CATT created, and why?

The CATT was created in 1995 in response to the growing need for research technologies to be applied directly to management challenges. The number of research personnel was, and still is, too small relative to the number of fisheries and aquatics resource managers to satisfy specific needs. Our mission is to increase the capacity of our partners through delivery of science-based support.

Where does CATT work?

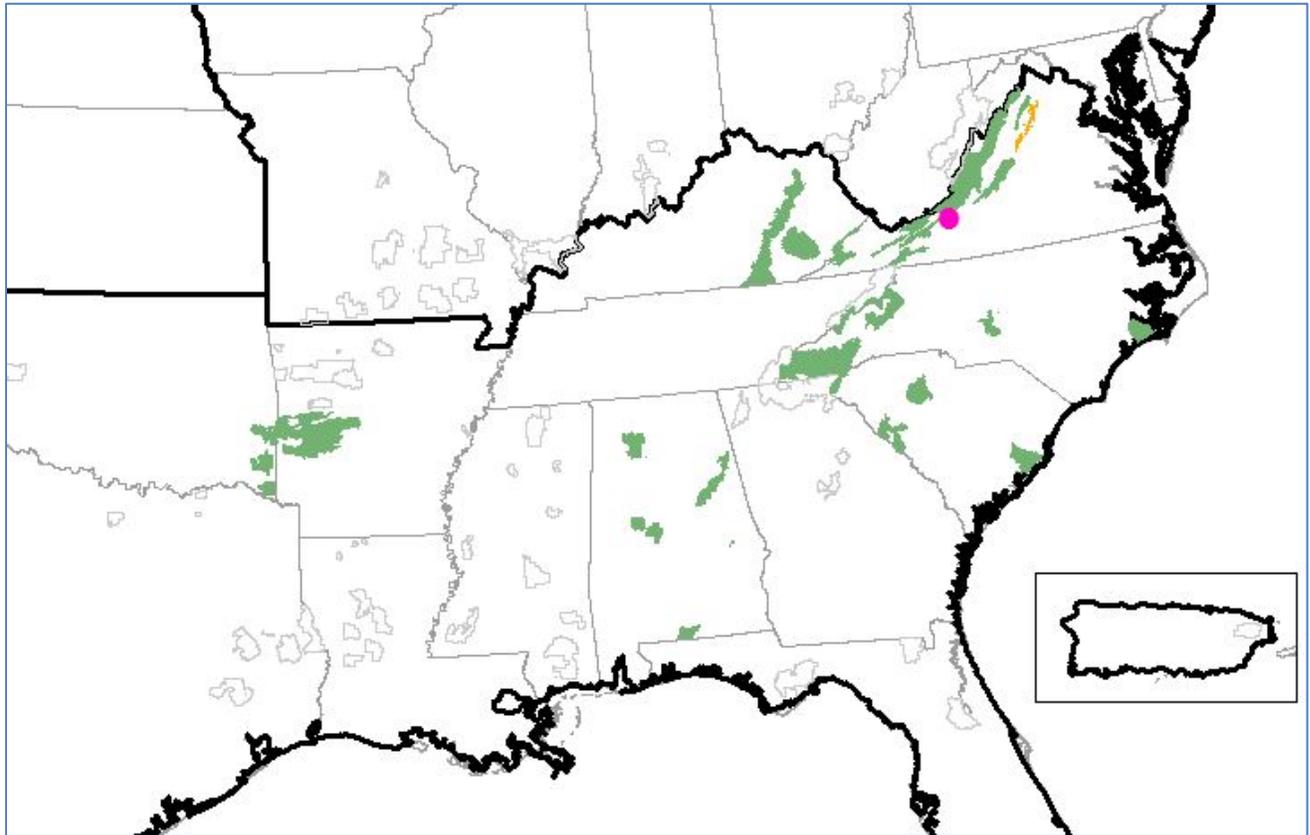
Full-time CATT personnel are stationed in Blacksburg, VA and we provide services to partners throughout the eastern U.S.

What services does CATT provide?

Our focus is on aquatics related management challenges. Our flexible organizational structure allows us to rapidly develop and apply custom solutions to both short and long term projects. Past projects range from providing a field technician for an afternoon of fish sampling, to region-wide, multi-year efforts, including sampling design, personnel management, data analysis, and reporting.

How can I find out more about CATT?

Contact Craig Roghair 540 230-8126 (croghair@fs.fed.us), or visit our website: <http://www.srs.fs.usda.gov/catt>



Several National Forests (green) and a National Park (orange) partnered with the CATT in fiscal year 2016. The USDA Forest Service, Southern Research Station, CATT is headquartered in Blacksburg, VA (pink circle).

CATT partners and projects in fiscal year 2016:

Partner	Project focus
Daniel Boone National Forest	Freshwater mussels and stream health
Francis Marion and Sumter National Forests	Exotic insects, large wood, and sedimentation
George Washington & Jefferson National Forests	American Eel growth and movement
George Washington & Jefferson National Forests	Candy Darter conservation
National Forests in Alabama	Stream health monitoring
National Forests in North Carolina	Brook Trout monitoring
Ouachita National Forest	Long-term stream monitoring program
Shenandoah National Park	Brook Trout population estimates
Southern Region (R8) Regional Office	CATT funding and oversight
Southern Research Station	Outreach and education
Washington Office	Brook Trout and water quality

Daniel Boone National Forest, KY

Project: Stream health in areas of freshwater mussel decline

Partners: Wendell Haag, Research Fishery Biologist, SRS
Jon Walker, Forest Hydrologist, Daniel Boone NF
Pam Martin, Forest Fishery Biologist, Daniel Boone NF

Objective:
Collect stream habitat, fish, and aquatic insect samples in support of a freshwater mussel study

Summary:
Horselick Creek once supported a diverse freshwater mussel assemblage, but over the past 20 years its mussels have mysteriously disappeared. The Forest Service Southern Research Station and the Daniel Boone NF have teamed up to investigate causes for mussel declines in Horselick Creek. In 2016, a team led by Forest Service scientist Wendell Haag placed small containers of juvenile mussels throughout Horselick Creek to determine if certain areas of the stream were prone to slow mussel growth or low survival. In summer 2016, CATT sampled habitat, fish, and aquatic insects in areas near the mussel containers to determine if stream biota other than mussels are also seeing declines. Results will be used to guide management recommendations for possible restoration of mussel populations in Horselick Creek.



London Ranger District



'Silo' containing juvenile mussels



Aquatic insects are used to assess stream health



Fish are used to assess stream health, too

Francis Marion and Sumter National Forests, SC

Project: Impacts of exotic insect invasion on large wood and sediment delivery to streams

Partners: Jim Knibbs, NEPA coordinator, Francis Marion & Sumter NFs
Jason Jennings, Soil Scientist, Francis Marion & Sumter NFs
Keith Whalen, Forest Fish Biologist, Francis Marion & Sumter NFs
Mike Aust, Forestry Researcher, Virginia Tech

Objective:
Count large wood and estimate sediment delivery to streams in areas invaded by an exotic insect

Summary:
The Hemlock Woolly Adelgid is an exotic insect capable of rapidly killing large numbers of hemlock trees. The insect invaded hemlock stands in western South Carolina and surrounding areas in the early 2000's and dead hemlocks now stand in large numbers along many mountain streams. Ultimately these standing dead trees either break apart in place or topple over, pulling up their roots. Broken and toppled trees that fall in or near streams help to improve habitat. However, the soil exposed by toppled trees can wash into streams, negatively impacting habitat. In 2016, the Francis Marion & Sumter NFs partnered with CATT and Virginia Tech to inventory hemlocks and large wood in and near streams, as well as estimate the amount of soil delivered to the stream as a result of hemlock toppling. Results will be used to recommend management actions to maximize large wood additions while limiting soil erosion and sedimentation.



Andrew Pickens Ranger District



Toppled hemlocks pull up roots and expose soil



Dead hemlocks will break or topple over



Fallen trees provide valuable in-stream structure

George Washington & Jefferson National Forests, VA

Project: American Eels in headwater mountain streams

Partners: Andy Dolloff, Research Fishery Biologist, Southern Research Station
Dawn Kirk, Forest Fishery Biologist, George Washington & Jefferson NFs
Scott Smith, Fishery Biologist, Virginia Department of Game & Inland Fisheries

Objective:
Monitor growth and movement of American Eels in headwater mountain streams

Summary:
American Eels may live for 20 – 30 years in freshwater streams before swimming out to the Sargasso Sea to reproduce and die, yet little is known of their biology or behavior in headwater mountain streams. The Southern Research Station began a long-term study in 1999 to monitor the growth, movement, and longevity of eels in several George Washington & Jefferson NF streams. The CATT has worked with Southern Research Station scientists annually since 2000 to collect and tag eels in 2 streams. We are still collecting American Eels that were originally tagged in 2000 demonstrating that adult eels reside for long periods of time in short reaches of mountain streams. In addition to providing information needed for the management of eels in headwater mountain streams, the project also provides the opportunity for education outreach about eels and forest management, attracting the attention of local residents and media.



Glenwood-Pedlar Ranger District



Eels are collected by electrofishing



Each eel has a small internal tag for identification



Changes in eel size and location can be detected

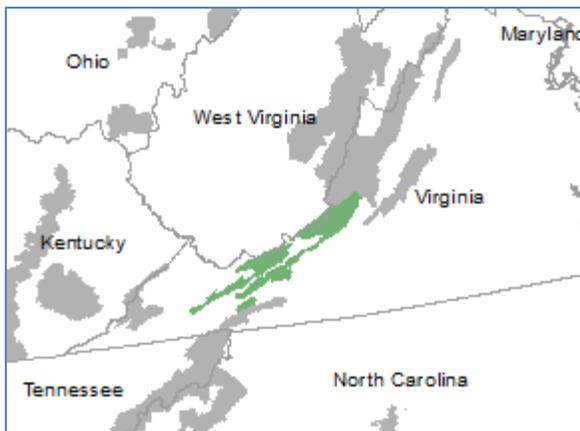
George Washington & Jefferson National Forests, VA

Project: Candy Darters conservation

Partners: Dawn Kirk, Forest Fishery Biologist, George Washington & Jefferson NFs
Paul Angermeier, Assistant Unit Leader, Virginia Cooperative Fish and Wildlife Research Unit
Katherine McBaine, MS candidate, Virginia Tech
Mike Pinder, Fish Biologist, Virginia Department of Game and Inland Fisheries

Objective:
Examine movement and genetics of a rare darter

Summary:
The Candy Darter has been lost from many streams within its small native range. Continued loss of quality stream habitat and hybridization with an introduced darter threatens remaining populations and as a result the small, colorful, bottom-dwelling fish is under review for listing under the Endangered Species Act. In Virginia, the Candy Darter currently occupies only a handful of streams and most populations are small and isolated. The best remaining populations in VA occupy streams that originate on, or flow through, the Jefferson National Forest. Virginia Tech recently began a multi-year study examining the movement and genetics of the remaining Candy Darter populations in Virginia. In 2016, CATT partnered with Virginia Tech to collect Candy Darters from several streams. A small tissue sample for genetic analysis was collected from each fish before they were returned to the stream. Ultimately results of the study will be used to inform listing decisions and to guide conservation efforts.



Eastern Divide Ranger District



Candy Darter



Collecting darters



Collecting tissue samples

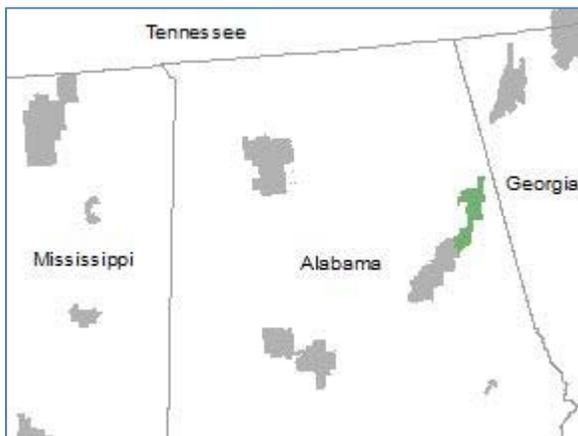
National Forests in Alabama

Project: Forest-wide stream health monitoring program

Partners: John Moran, Forest Fishery Biologist, NFs in Alabama
Patrick O'Neal, Director, Ecosystems Investigations Program, Geological Survey of AL
Rebecca Bearden, Biologist, Geological Survey of AL

Objective:
Collect fish samples in support of a Forest-wide stream health monitoring program

Summary:
Since the 1990's the state agencies in Alabama have use rapid biological assessments based on fish communities to assess stream health. Although some sampling occurred on the NF in AL, a coordinated and systematic approach to assessing National Forest streams was lacking. The NF in AL recently took steps towards establishing Forest-wide stream health monitoring program modeled on the established protocols used by state agencies. In 2016, the NF in AL partnered with the Geological Survey of AL and CATT to sample fish from several streams in support of the monitoring program. Results of the monitoring program will be used to assess effects of Forest management practices on stream health.



Shoal Creek Ranger District



Fish are indicators of stream health



Collecting fish



Identifying and counting fish

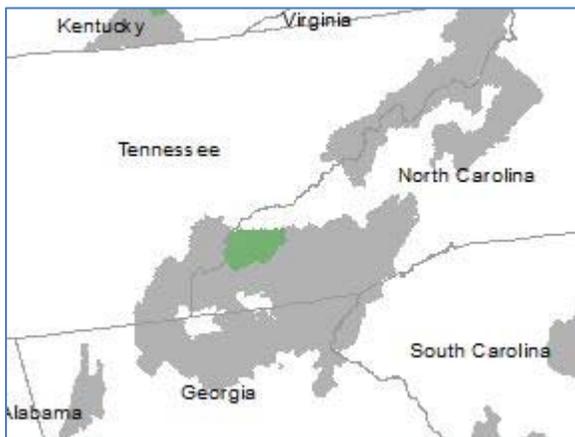
National Forests in North Carolina

Project: Brook Trout monitoring

Partners: Jason Farmer, District Fishery Biologist, NFs in NC
Sheryl Bryan, Forest Fishery Biologist, NFs in NC
Jake Rash, NC Wildlife Resources Commission
Powell Wheeler, NC Wildlife Resources Commission

Objective:
Assess Brook Trout distribution, response to liming projects, and genetic structure

Summary:
Brook Trout in the southern Appalachians face many challenges. Changes in habitat and water quality exclude Brook Trout from many streams in their native range. Remaining populations are often small, isolated, and facing threats from non-native Rainbow and Brown Trout, parasites and disease. The National Forests in North Carolina manages watersheds with some of the best remaining Brook Trout habitat in the southern Appalachians. The NF in NC work with a variety of partners to monitor trout populations and implement mitigation and habitat improvement projects. In 2016, the CATT partnered with the NF in NC and the NC Wildlife Resources Commission to monitor trout populations in several headwater mountain streams. Our results will be used update Brook Trout population distribution maps, assess the effectiveness of stream liming projects, and to inform Brook Trout conservation efforts.



Cheoah Ranger District



Brook Trout



Searching for trout in a small mountain stream



Habitat looks good, but how is the water quality?

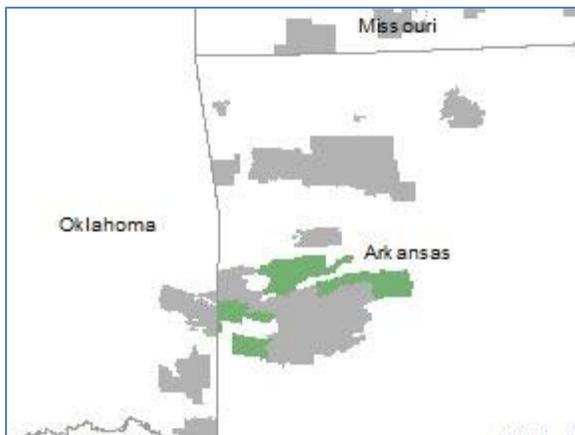
Ouachita National Forest, AR

Project: Long-term stream monitoring

Partners: Bill Pell, Staff Officer, Ouachita NF
Rich Standage, Forest Fishery Biologist, Ouachita NF
Jade Ryles, Natural Resources Manager, Ouachita NF
Aleth Little, Forest Planner, Ouachita NF
Mitzi Cole, Fishery Biologist, Ouachita NF
Eric Moser, Hydrologist, A&B Enterprise Unit

Objective:
Complete habitat, fish, and aquatic insect sampling in support of a long-term stream monitoring program

Summary:
The Ouachita NF established a long-term stream monitoring program in 1990 to assess the effects of watershed management on stream health. Monitoring occurred at 5 year intervals and included habitat, fish, aquatic insect, and water quality sampling. All monitoring was completed under the direction of the Forest Hydrologist, who trained and managed field teams. Monitoring protocols were summarized in several reports, but a detailed field guide was not produced before the Forest Hydrologist retired in 2012. In 2016, the Ouachita NF partnered with the CATT to produce a comprehensive field guide for the monitoring program, and to hire, train, and deploy a field team to complete habitat, fish, and aquatic insect samples in eight streams across the Forest. Results will be used to examine for trends in stream health and to identify watershed management approaches that produce healthy streams.



Cold Springs, Mena, Fourche, Winona Districts



Collecting fish



Measuring stream habitat



Documenting a road-stream crossing

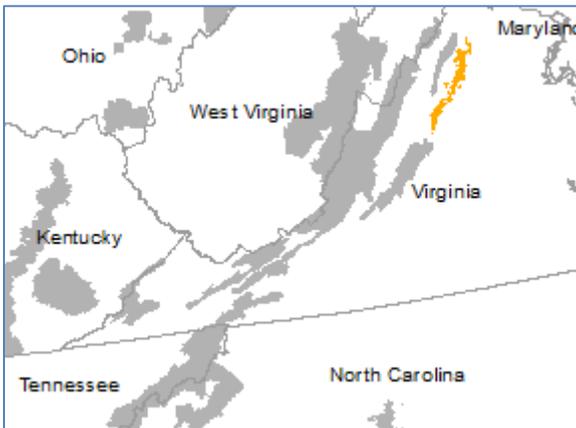
Shenandoah National Park, VA

Project: Annual Brook Trout population estimates in Shenandoah National Park, VA

Partners: Andy Dolloff, Research Fishery Biologist, Southern Research Station
David Demarest, Acting Fisheries & Wildlife Biologist, Shenandoah National Park

Objective:
Estimate Brook Trout population size in two Shenandoah National Park streams

Summary:
Long term studies allow researchers to describe trends that may not be evident from shorter studies. Since 1993, the Southern Research Station has conducted annual surveys using a combination of diver counts, backpack electrofishing, and fish tagging to estimate the distribution, abundance, and growth of Brook Trout and other coldwater fishes in two Shenandoah National Park streams. The CATT has provided field support for the project since 1995 and maintains the project database. We are examining the role that environmental factors such as acid precipitation, floods, droughts, water temperature, and invasive species may have on Brook Trout population ecology. Understanding such effects allows resource specialists to more effectively manage Brook Trout populations.



Shenandoah National Park



A diver counts fish



Confirming the diver's count



Brook Trout

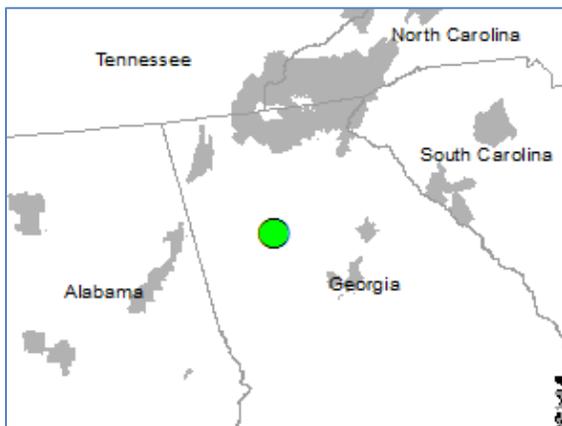
Southern Region (R8) Regional Office

Project: CATT funding and oversight

Partners: Robert Trujillo, Director, Biological and Physical Resources, R8 Regional Office
Leigh McDougal, Fisheries Program Manager, R8 Regional Office
Kevin Leftwich, Aquatic Ecologist, Southern Research Station, R8 Regional Office
Tony Crump, Hydrologist, R8 Regional Office

Objective:
Provide science-based support for aquatics-related management challenges in the Southern Region

Summary:
Managing for abundant clean water and resilient, adaptive watersheds on National Forests in the Southern Region is an increasingly complex and important goal. To meet this challenge National Forests require science-based solutions delivered in a timely manner. The base funding provided for the CATT program through the Regional Office allows us to address this need. Base funds are used to support and equip a small workforce that provides a direct connection between the National Forest System and Forest Service Research & Development. From this base we leverage funding from other partners to build a flexible workforce that is capable of providing a variety of on-demand services throughout the Region. Our services include range from simple consultation to management of multi-year, Region-wide projects. As we continue to explore new and creative ways to address the need for timely, reliable solutions to the ever-expanding list of management challenges, our partnership with the Regional Office ensures that the CATT will be well positioned to meet the needs of National Forests throughout the South.



Regional Office, Atlanta, GA



Bringing science to the field



Presenting to Ranger District personnel



Project planning with National Forest managers

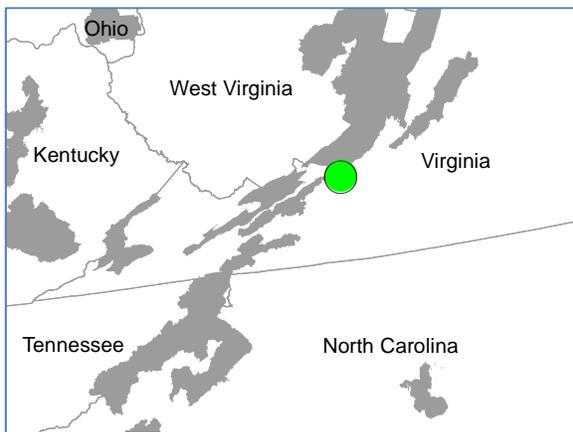
Southern Research Station, Blacksburg, VA

Project: Public outreach and education programs

Partners: Kim Winter, NatureWatch National Program Leader, Washington Office
Keith Williams, Director of NorthBay (non-profit environmental educators), MD
Dawn Kirk, Fishery Biologist, George Washington & Jefferson NFs

Objective:
Provide opportunities for people to connect with the outdoors and learn about the Forest Service

Summary:
Connecting people to the outdoors is an important and increasingly challenging part of our mission. Over the past several years the CATT has partnered with local daycares, grade schools, and youth programs to provide an introduction to local stream fishes, watersheds, and the Forest Service mission. In 2016, we partnered with the FS NatureWatch Program, NorthBay, and the George Washington & Jefferson National Forests in a rollout of the new Snorkeling Education Toolkit. We also partnered with the Eastern Divide Ranger District on the George Washington & Jefferson NFs to provide a local field day for girls ranging in age from kindergarten to high school. Our programs were designed to deliver a 'Forests to Faucets' message, highlight the role of the Forest Service in managing healthy watersheds, and discuss ways students can make an impact locally. In 2017, we will partner with NorthBay to expand our snorkeling education program to additional National Forests.



Southern Research Station Lab, Blacksburg, VA



Looking beneath the surface



Exploring watersheds



A streamside classroom

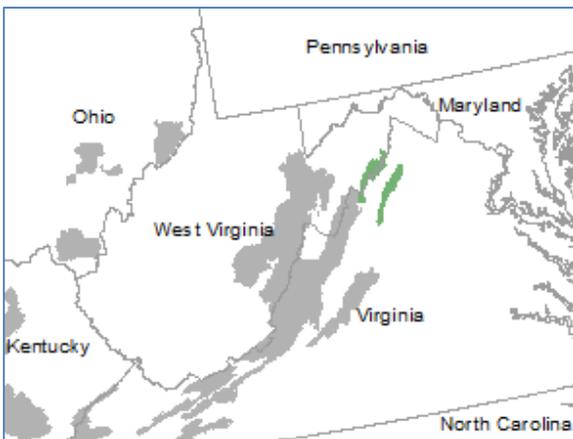
Washington Office

Project: Brook Trout response to stream remediation with limestone sand

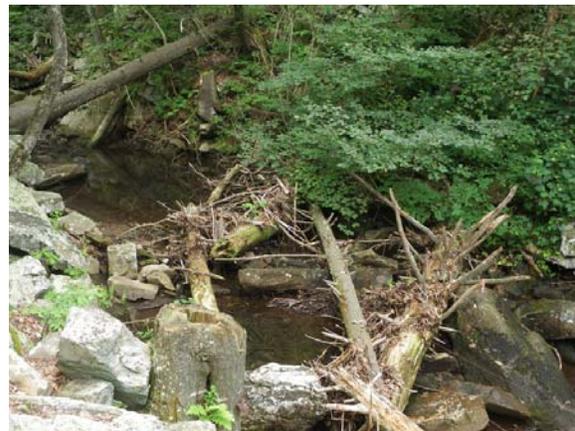
Partners: Nat Gillespie, Assistant National Fisheries Program Leader, WO
Keith Nislow, Research Fishery Biologist, Northern Research Station
Jason Coombs, University of Massachusetts
Dawn Kirk, Fishery Biologist, George Washington and Jefferson NFs

Objective:
Monitor Brook Trout population size and distribution in an acid-sensitive stream

Summary:
Recent estimates suggest that over 50,000 miles of streams in the Appalachian region are prone to acidification as a direct result of acid precipitation. This acidification typically results in declines and losses of fish and other sensitive aquatic organisms. All fish were lost from Fridley Run and Mountain Run in the 1970's, when acidification created intolerable water quality conditions. In 1993, limestone sand was added to Fridley Run to neutralize the acidification. Brook Trout were transplanted into the stream shortly thereafter and an annual sampling program was initiated to monitor population size and movement. In 2004, genetic sampling was added to the annual monitoring protocol to provide additional information on population demographics and movement. The CATT has participated in these surveys since 1995, and in 2016 we completed the annual population and genetic sampling. This project has been the subject of multiple presentations, posters, and journal articles and continues to provide valuable information to resource managers.



Lee Ranger District



Acidification removes fish from quality streams



Collecting fish from Fridley Run



A sign of continued Brook Trout reproduction