



# CATT

## Fiscal Year 2015 Report

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

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# Frequently Asked Questions

## **What is the 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). Our project partners are primarily NFS managers and resource specialists. Guided by core values of communication, partnership, inclusion, accountability, and safety, we collaborate with SRS scientists to develop custom solutions for our project partners.

## **When was the 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 problems. The number of research personnel was, and still is, too small relative to the number of NFS managers to satisfy specific needs. Our mission is to increase the capacity of our partners through delivery of science-based support.

## **Where does the CATT work?**

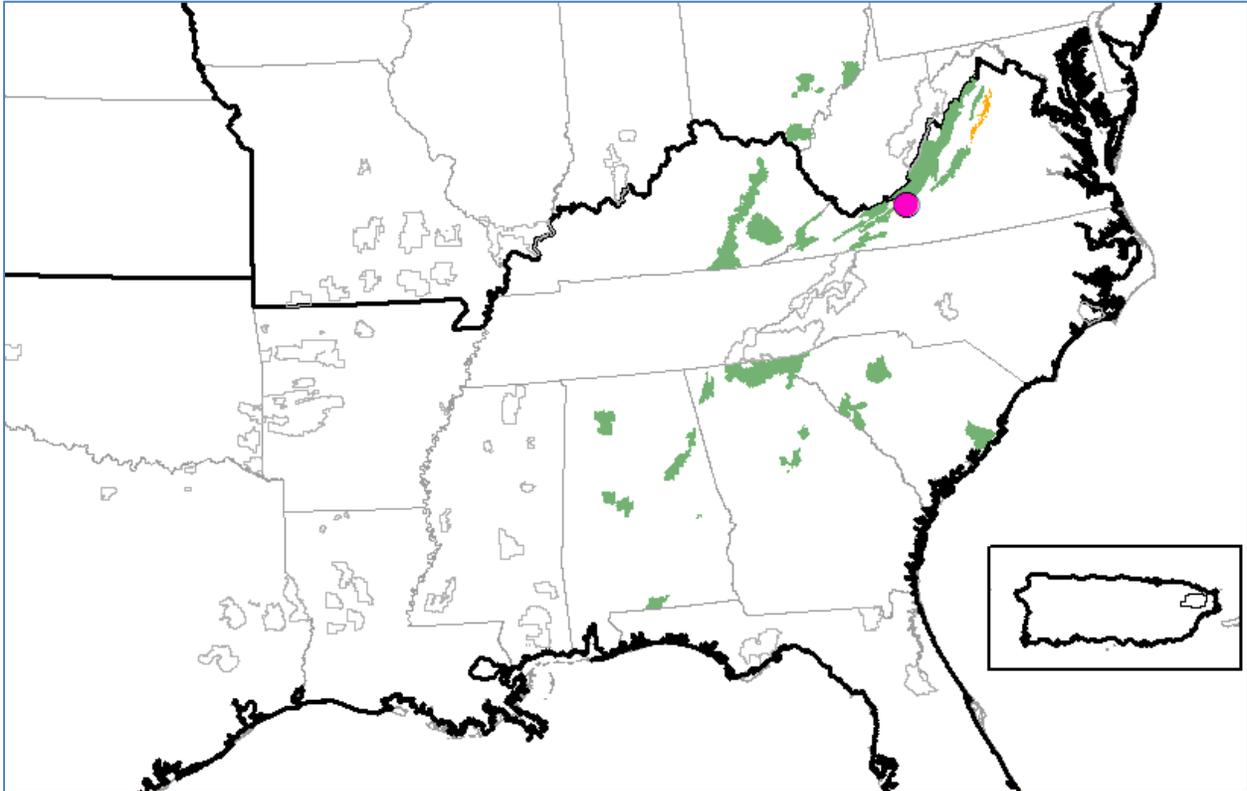
Full-time CATT personnel are stationed in Blacksburg, VA. We work mostly on NFS managed lands in the Southern and Eastern Regions. We also provide support to SRS research projects on other Federal, State, and private lands.

## **What services does the 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 the 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 2015. The USDA Forest Service, Southern Research Station, CATT is headquartered in Blacksburg, VA (pink circle).

CATT partners and projects in fiscal year 2015:

Partner	Project focus
Chattahoochee-Oconee National Forest	Brook Trout habitat inventory
Daniel Boone National Forest	Mining impacts on stream health
Francis Marion & Sumter National Forests	Mapping water flow and assessing fish passage
George Washington & Jefferson National Forests	Impact of exotic insects on fish habitat
George Washington & Jefferson National Forests	American Eel growth and movement
George Washington & Jefferson National Forests	Movement of wood in streams
National Forests in Alabama	Fish, crayfish, and mussels upstream of a reservoir
Shenandoah National Park	Brook Trout population estimates
Southern Region (R8) Regional Office	Provide base funding and support for the CATT
Southern Research Station	Outreach and education
Washington Office	Brook Trout recovery after stream liming
Wayne National Forest	Road crossing improvement surveys

# Chattahoochee-Oconee National Forest, GA

**Project:** Brook Trout habitat inventory

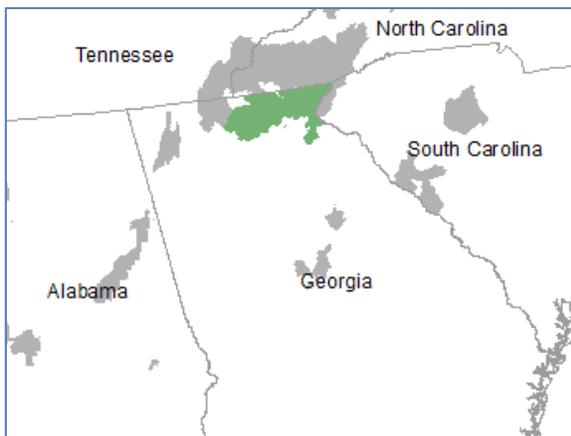
**Partners:** Mike Joyce, Forest Fishery Biologist, Chattahoochee-Oconee NF  
Dick Rightmyer, Soil Scientist, Chattahoochee-Oconee NF

**Objective:**

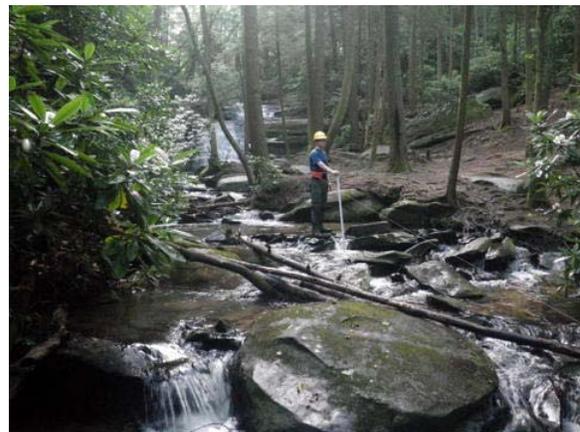
Assess quality of stream habitat and potential for stream habitat improvement with addition of wood

**Summary:**

The Chattahoochee-Oconee NF is working to improve stream habitat for native Brook Trout through addition of wood. The Forest has a long history of stream habitat improvement projects, typically through the construction and installation of hard structures composed of logs, rebar, and stone. Many hemlock trees along trout streams have died due to the recent infestation by an exotic invasive insect, hemlock wooly adelgid. The Chattahoochee-Oconee NF recognizes the potential for adding the dead hemlocks to increase the depleted large wood supply in many of its trout streams. In 2014 and 2015, the CATT partnered with the Chattahoochee-Oconee NF to conduct in-stream habitat and stream-side tree inventories along several trout streams on the Forest. The results will be used to target stream reaches with low wood counts and high hemlock tree mortality for habitat improvement projects.



Blue Ridge and Chattoga River Ranger Districts



A high gradient Georgia trout stream



Fallen hemlock trees create pools for trout



Wood of all sizes is beneficial for fish

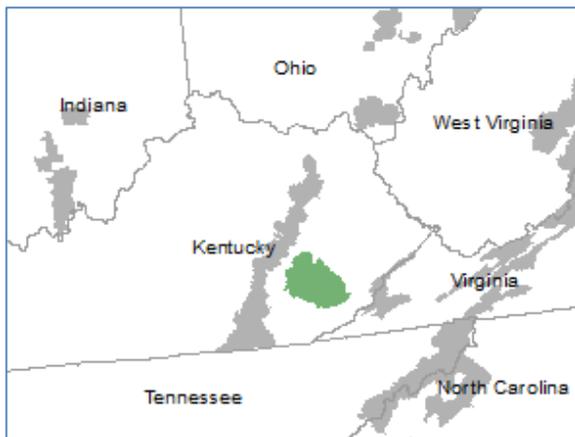
# Daniel Boone National Forest, KY

**Project:** Effects of mining on stream health

**Partners:** Jon Walker, Forest Hydrologist, Daniel Boone NF  
Pam Martin, Forest Fishery Biologist, Daniel Boone NF  
Margueritte Wilson, Remedial Project Manager, R8 Regional Office

**Objective:**  
Collect fish and aquatic insects and record stream channel characteristics to examine for impacts of mining on Daniel Boone NF streams

**Summary:**  
Mining operations on and near the Daniel Boone NF have the potential to impact stream health and water quality. The Daniel Boone NF has identified several stream reaches downstream of mines where water quality and stream habitat may be impacted by mine drainage. The Daniel Boone NF has partnered with the CATT to sample stream habitat, fish, aquatic insects, and sediment in stream reaches upstream and downstream of mine drainage areas annually since 2013. Results are used to compare stream health in mine affected areas to areas without mining influence and to explore options for remediation.



Redbird Ranger District



Excessive sediment can impact stream health



Aquatic insects are used to assess stream health



Fish are used to assess stream health, too

# Francis Marion & Sumter National Forests, SC

**Project:** Mapping water flow and assessing fish passage in a coastal plain watersheds

**Partners:** Jeanne Riley, Forest Fishery Biologist, Francis Marion & Sumter NF  
Larue Bryant, Forest Engineer, Francis Marion & Sumter NF  
Geoffrey Holden, GIS Program Manager, Francis Marion & Sumter NF  
James Knibbs, NEPA Coordinator, Francis Marion & Sumter NF

**Objective:**  
Identify potential pathways for water flow in an extremely low gradient landscape

**Summary:**  
Determining the direction of water flow across extremely flat landscapes such as coastal plains can be very difficult. Lack of accurate drainage and flow network maps presents challenges for managing streams and wetlands on the Francis Marion Ranger District. The Francis Marion & Sumter NF is currently mapping watersheds across the entire District. A critical component in the mapping effort is finding locations where water can cross underneath road beds. The only way to identify these 'crossdrains' is through an intensive mapping effort on over 700 miles of roads within the boundary of the District. In 2014, the CATT partnered with the Francis Marion & Sumter NF to develop and test methods for locating pipes buried beneath road fill. In 2015, we deployed field crews to inventory crossdrain pipes and assess aquatic organism passage at road crossings. Project results will be used to inform revision of the Francis Marion Forest Plan through development of accurate flow maps and identification of stream and wetland diversions, maintenance problems, and other opportunities for remediation projects.



Francis Marion Ranger District



A well-hidden 'crossdrain' pipe



Some pipes must pass both water and fish



Locating hidden pipes is challenging

## George Washington & Jefferson National Forests, VA

**Project:** Assessing the impact of the exotic insect hemlock wooly adelgid on fish habitat quality

**Partners:** Dawn Kirk, Forest Fishery Biologist, George Washington & Jefferson NFs

**Objective:**

Repeat fish habitat inventories to assess changes in fish habitat over a 20 year period

**Summary:**

In the 1990's the exotic insect hemlock wooly adelgid spread rapidly throughout Virginia, killing hemlock trees along many mountain streams. By 2015, many dead hemlock trees had toppled into streams, providing welcome input of wood to many wood-depleted streams. The George Washington & Jefferson NFs partnered with the CATT to complete stream habitat inventories on several impacted trout streams in 1995, 2005, and 2015 providing the opportunity to evaluate changes in stream habitat conditions associated with the new input of wood. Project results will be used to examine for changes in stream characteristics such amount of wood, pool area, and pool depth, all key factors in providing quality habitat for Brook Trout. Hemlock wooly adelgid continues to spread and is currently affecting trees along streams from Maine to Georgia. The results of this project will help to inform management of streams throughout the impacted region.



Glenwood-Pedlar Ranger District



A mountain trout stream in Virginia



Fallen hemlock provides needed structure



Long, shallow riffle in area lacking large wood

# 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. As of 2015, 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

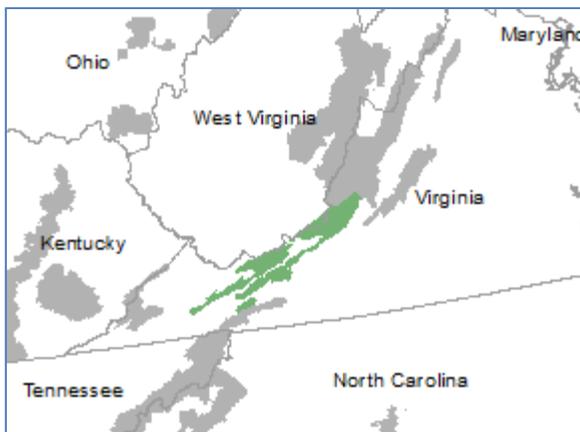
# George Washington & Jefferson National Forests, VA

**Project:** Movement of wood in headwater mountain streams

**Partners:** Dawn Kirk, Forest Fishery Biologist, George Washington & Jefferson NFs  
Andy Dolloff, Research Fishery Biologist, Southern Research Station, Blacksburg, VA

**Objective:**  
Monitor the long-term movement of wood in headwater mountain streams

**Summary:**  
Trees that fall in streams increase the amount of food and shelter available to animals living in and near the water, but also can cause damage to roads and other structures if they move during floods. Resource managers may be asked to remove wood from streams as a preemptive measure against property damage. A better understanding of the mobility of wood in mountain streams is needed to inform managers faced with the decision between retaining wood to improve stream quality, or removing wood from streams to protect nearby infrastructure. In 1993, the Southern Research Station began to study wood movement in two mountain streams. Large logs were purposely added to streams and their location was recorded. The CATT has surveyed the logs for movement each year since 1994 and maintains the project database. Log movement information is updated annually is incorporated into presentations to resource managers tasked with managing wood in streams.



Eastern Divide Ranger District



Wood creates pools for fish



Log jams keep wood from moving long distances



Some logs are broken after 20 years of decay

## National Forests in Alabama

**Project:** Investigate the effects of dam operation on fish, crayfish, and mussels upstream of a reservoir

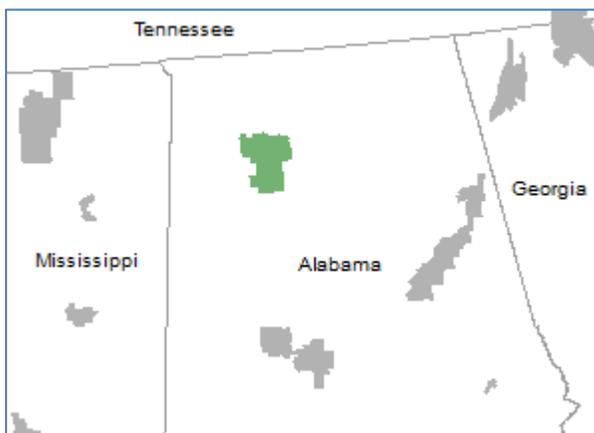
**Partners:** John Moran, Forest Fishery Biologist, NFs in Alabama  
Allison Cochran, District Biologist, Bankhead Ranger District  
Susie Adams, Team Leader, Southern Research Station, Oxford, MS  
Stuart McGregor, Aquatic Biologist, Geological Survey of Alabama

**Objective:**

Sample fish, crayfish, and mussel communities during both low and high pool conditions at the river-reservoir interface upstream of Lewis Smith Reservoir

**Summary:**

The NFs in Alabama recently reached an agreement with Alabama Power via the FERC hydropower relicensing process for Lewis Smith Dam. Alabama Power is providing support for investigating effects of dam operation on the river transition zone upstream of the reservoir. Dam operation results in large changes in lake levels causing several miles of the river-reservoir interface to alternate between lake-like and stream-like conditions each year. Beginning in 2012, the NFs in Alabama partnered with the CATT in a multi-year effort to document the highly diverse fish, crayfish, and mussel communities present at the river-reservoir interface during both low- and high-pool conditions. Project results will contribute to formation of a plan for long-term monitoring and management in the rivers and streams upstream of the reservoir.



Bankhead Ranger District



Boat electrofishing



Benthic trawl



Backpack electrofishing

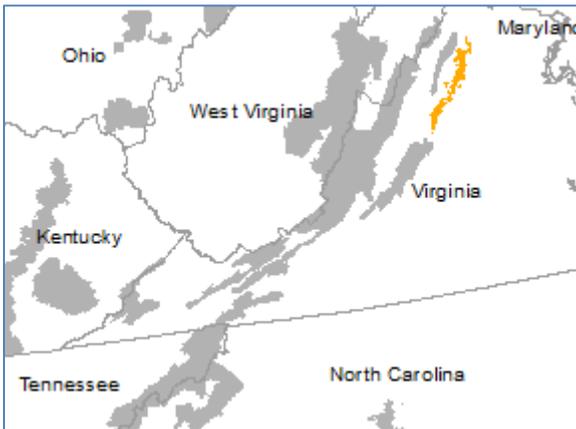
# Shenandoah National Park, VA

**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

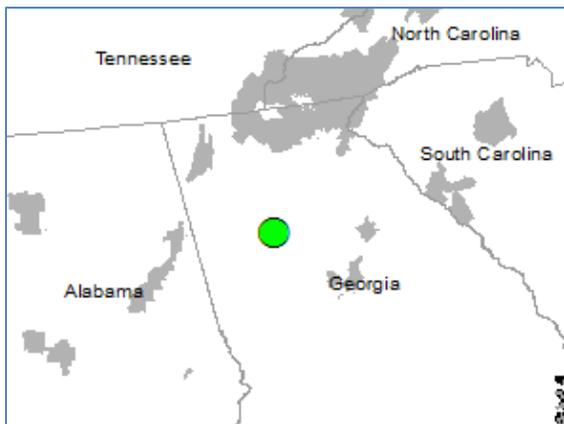
## Southern Region (R8) Regional Office

**Project:** Provide base funding and support for the CATT

**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 serves as a liaison 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. CATT services range from simple over-the-phone or email consultation, to providing a team of biologists and technicians for a pay period, 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 program

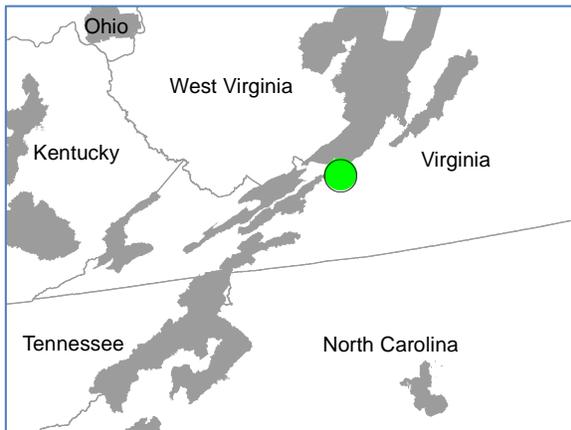
**Partner:** George Washington & Jefferson NFs

**Objective:**

Provide opportunities for people to interact with the nature and learn about the Forest Service

**Summary:**

Connecting people to the natural world 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 2015, we participated in a high school field day on the Eastern Divide Ranger District of the George Washington & Jefferson NFs. We teamed with a local high school to discuss impacts of development, exotic insects, and forest management on watersheds. Students gained an increased understanding of stressors on watershed health, a better appreciation for the natural world, and an introduction to the role of the Forest Service in providing clean, abundant water to local communities.



Southern Research Station Lab, Blacksburg, VA



Meeting an American Eel



Exploring watersheds



A streamside classroom

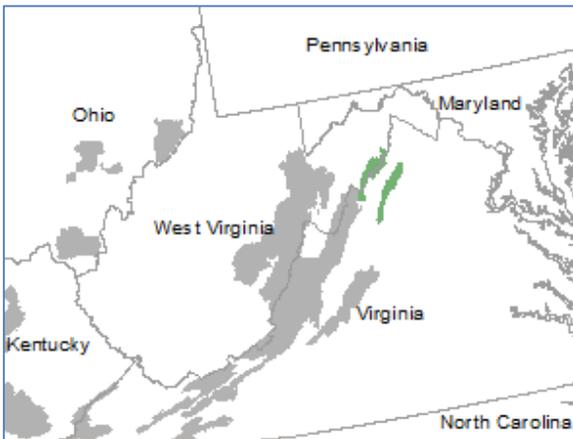
## Washington Office

**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 2015 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

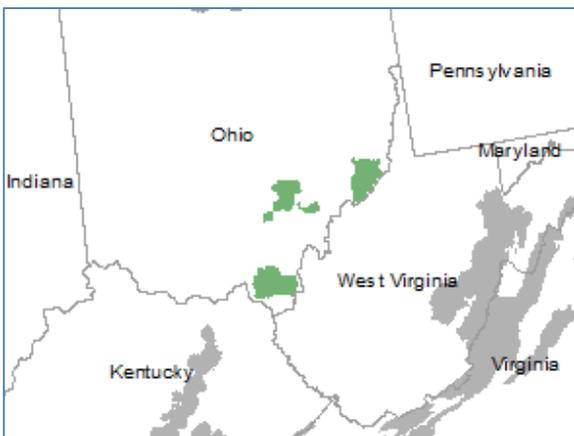
# Wayne National Forest, OH

**Project:** Road-stream crossing improvement inventory

**Partners:** Patrick Mercer, Wildlife Biologist, Wayne NF  
Jason Reed, Natural Resources Staff Officer, Wayne NF  
John Rothlisberger, Regional Aquatic Ecologist, R9 Regional Office

**Objective:**  
Inventory road-stream crossings and assess fish passage on the Wayne National Forest

**Summary:**  
The Wayne National Forest recognizes the importance of improving its road system to provide safe and efficient transportation, resilience to extreme weather events, and benefits for aquatic species. In 2007 the Wayne NF began a systematic inventory and assessment of road crossings (e.g. bridges, culverts, fords) within its boundaries. Between 2007 and 2011 the Wayne NF completed assessments at over 1,200 crossings, including many crossings on state and private lands within the Forest boundary. In 2015 the Wayne NF partnered with the CATT to inventory additional crossings. CATT teams visited over 500 crossings and completed fish passage assessments at all crossing with the potential to block fish movement. Project results will be used by the Wayne NF to prioritize crossing improvement projects in partnership with state and local landowners.



Ironton and Athens Ranger Districts



Crossings come in a wide variety of configurations



Large drops block upstream fish passage



Private land owners are important partners