



# CATT

## Fiscal Year 2014 Report

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

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Visit our website at <http://www.srs.fs.usda.gov/catt>

# 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 goal is to provide an increased level of support to our NFS partners.

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

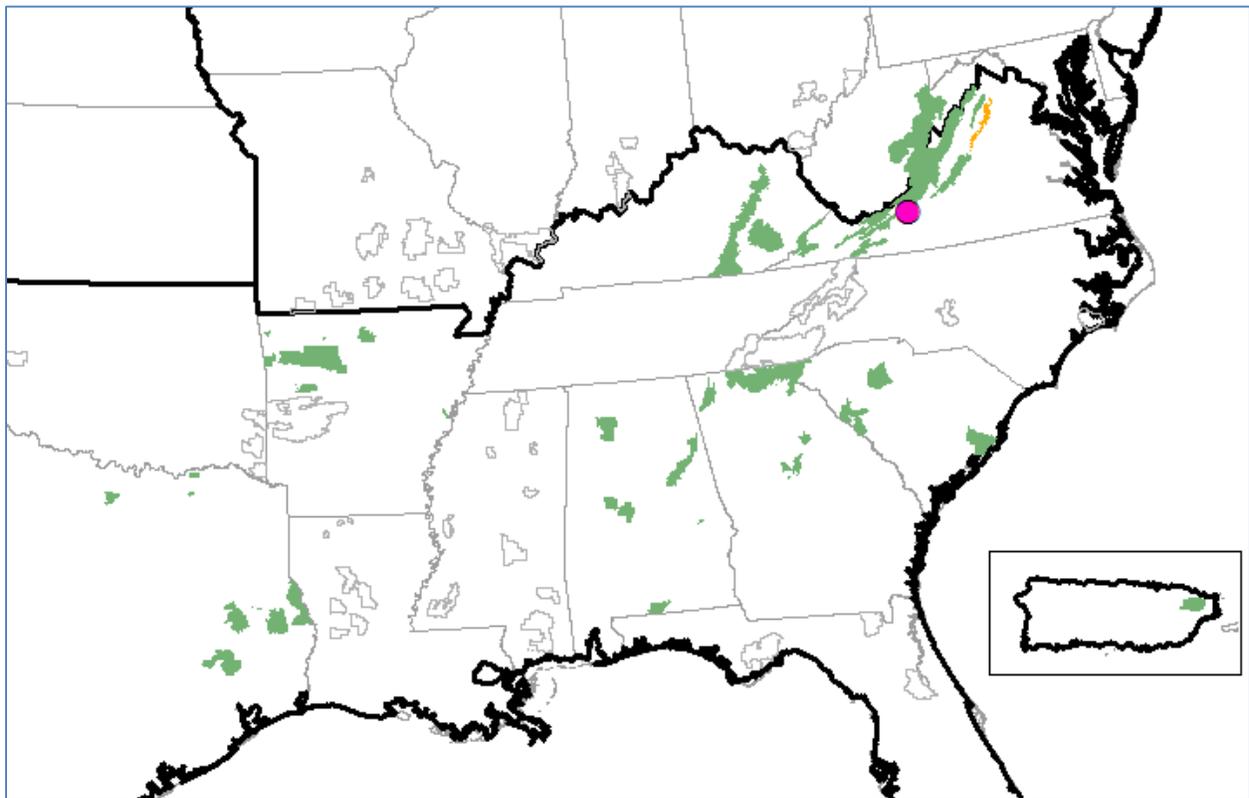
Full-time CATT personnel are stationed in Blacksburg, VA. We work mostly on NFS managed lands in the Southern and Eastern Regions. We also provide support to SRS research projects on other Federal, State, and private lands.

## **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 540 231-0078 (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 2014. The USDA Forest Service, Southern Research Station, CATT is headquartered in Blacksburg, VA (pink circle).

CATT partners and projects in fiscal year 2014:

Partner	Project focus
Multiple National Forests	Large wood inventory following invasive insect infestation
Bankhead National Forest	Fish, crayfish, and mussels in reservoir transition zone
El Yunque National Forest	American Eel distribution and abundance
Daniel Boone National Forest	Stream habitat and biota monitoring
George Washington National Forest	Road crossing replacement prioritization
Daniel Boone National Forest	Mining impacts on stream health
Monongahela National Forest	Aquatic organism passage surveys
Southern Research Station	Outreach at local field day
George Washington National Forest	American Eel growth and movement
Washington Office	Brook Trout resilience
Ozark National Forest	Aquatic organism passage surveys
Chattahoochee National Forest	Brook Trout habitat inventory
George Washington National Forest	Stream habitat improvement survey
Jefferson National Forest	Large wood movement
Sam Houston National Forest	Aquatic organism passage surveys
Shenandoah National Park	Brook Trout population estimates
Francis Marion National Forest	Culvert and crossdrain inventory

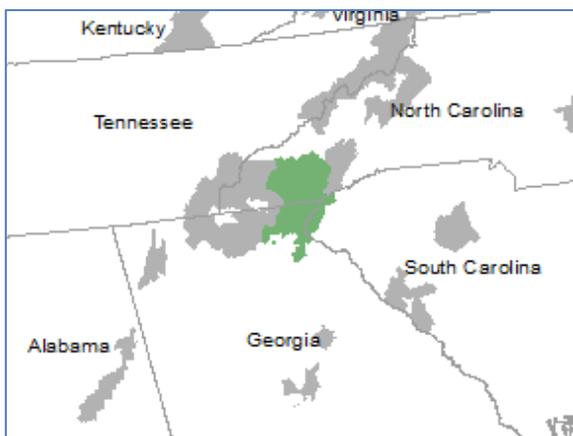
## Multiple National Forests: SC, NC, GA

**Project:** Large wood inventory of the upper Chattooga River.

**Partners:** Jeanne Riley, Forest Fishery Biologist, Sumter NF  
Mike Joyce, Forest Fishery Biologist, Chattahoochee NF  
Sheryl Bryan, Nantahala NF

**Objective:**  
Determine amount and distribution of large wood in areas affected by invasive insects

**Summary:**  
Resource management challenges often cross National Forest boundaries; such is the case with the hemlock wooly adelgid infestation in the eastern U.S. Introduced to the mid-Atlantic in the mid-1950s and spreading into North Carolina, South Carolina, and Georgia in the past decade, this tiny insect is able to kill large numbers of hemlocks quickly. As the hemlocks die they begin to shed braches and tops, then may topple entirely into streams and rivers. When large wood falls into or near streams it benefits fish, amphibians, and aquatic invertebrates but presents hazard to boaters. National Forests in South Carolina, Georgia, and North Carolina have partnered with the CATT to determine the amount and location of large wood accumulations so they can maximize benefits to aquatic organisms while still providing high quality and safe recreation opportunities.



Andrew Pickens, Chattooga River, and Nantahala Ranger Districts



Large wood on Holcomb Creek



Woolly adelgid infestation on Overflow Creek



Recent large wood fallen into Overflow Creek

# Bankhead National Forest, AL

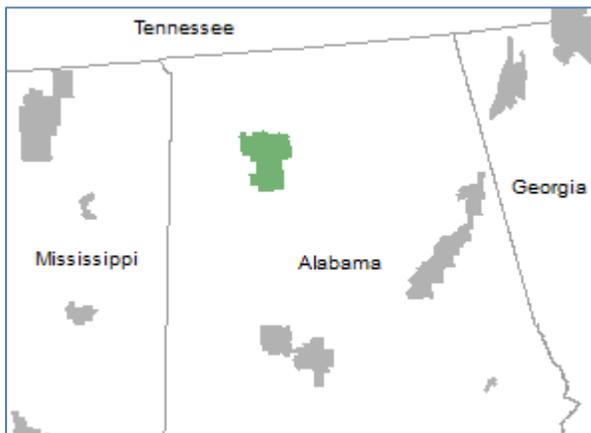
**Project:** Investigate the effects of dam operation on fish, crayfish, and mussels upstream of a reservoir

**Partners:** John Moran, Forest Fishery Biologist, NFAL  
Allison Cochran, District Biologist, Bankhead NF  
Mel Warren, Team Leader, SRS, Oxford, MS  
Stuart McGregor, Aquatic Biologist, Geological Survey of Alabama

**Objective:** Sample fish, crayfish, and mussel communities during both low and high pool conditions in the transitional area upstream of Lewis Smith Reservoir

## Summary:

The Bankhead NF recently reached an agreement with Alabama Power via the dam relicensing process for Lewis Smith Reservoir. 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 river within the transition zone to alternate between lake-like and stream-like conditions each year. In 2012, the Bankhead NF partnered with the CATT to begin a multi-year effort documenting the types of fish, crayfish, and mussel present during both low and high pool conditions in the transition zone. Ultimately project results will inform a plan for long-term monitoring in rivers and streams upstream of the reservoir.



Bankhead National Forest



Boat electrofishing



Benthic trawl



Backpack electrofishing

# El Yunque National Forest, PR

**Project:** American Eel population distribution and abundance

**Partner:** Felipe Cano, Forest Biologist, EYNF

**Objective:**

Determine the distribution and abundance of American Eels in El Yunque NF streams

**Summary:**

American Eels historically occupied all rivers and streams in the Atlantic basin ranging from Canada to South America. Unlike salmon, which spawn in freshwater but spend a major portion of their adult life in the ocean; American Eels spend most of their adult lives (up to 20years) in fresh water rivers and streams, but migrate to the Sargasso Sea to reproduce. Their young drift on ocean currents, eventually finding coastal rivers and migrate upstream to find food and mature. Recent studies suggest that populations of American Eel are in decline due to overfishing, pollution, dams, and other blocks to migration, prompting a review for potential listing as a Threatened or Endangered Species under the Federal Endangered Species Act. Recent fish inventories by the USGS in Puerto Rico showed that the distribution of American Eel is more widespread than previously thought. The CATT partnered with the El Yunque NF in 2014 to complete American Eel inventories in several streams known or thought to contain eels. The results of the surveys will be used to develop management plans to benefit American Eel populations and habitat in Puerto Rico.



El Yunque National Forest



Electrofishing for eels in Rio Fajardo



American Eel caught in Rio Sabana



Setting a blocknet in Rio Fajardo

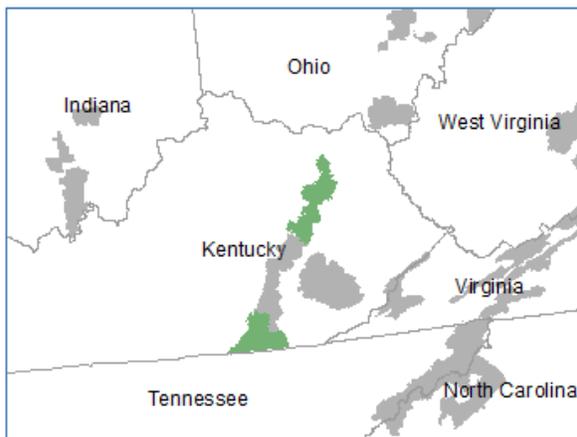
# Daniel Boone National Forest, KY

**Project:** Long-term stream monitoring program

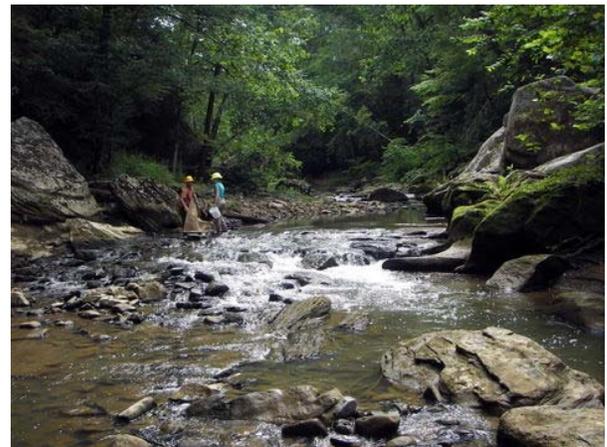
**Partners:** Jon Walker, Forest Hydrologist, DBNF  
Pam Martin, Forest Fishery Biologist, DBNF

**Objective:**  
Collect fish and aquatic insects and record stream channel characteristics in support of the Daniel Boone National Forest long-term stream monitoring program

**Summary:**  
Long-term monitoring plans allow National Forests to detect and respond to trends in forest health. Each year the Daniel Boone NF collects information on stream habitat, fish, and aquatic insects in support of its long-term stream monitoring program. Samples are collected from randomly selected locations on medium-sized streams located across the Daniel Boone NF using standardized techniques. Since 2005, the Daniel Boone NF has partnered with the CATT to collect its stream samples. We collect fish and aquatic insects, measure substrate particles, record stream characteristics and summarize the results in an annual report to the Daniel Boone NF. The Daniel Boone NF is able to use the information to monitor for changes in stream health over time.



Cumberland and Stearns Ranger Districts



Investigating a DBNF stream



Aquatic insect collection



Identifying stream fish

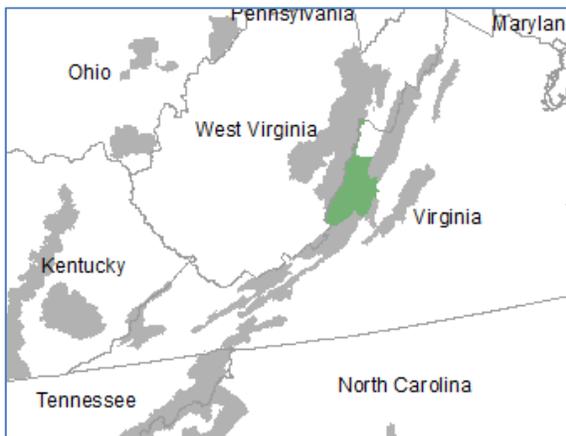
# George Washington National Forest, VA

**Project:** Road crossing improvement prioritization

**Partners:** Dawn Kirk, Forest Fishery Biologist, George Washington NF  
Karen Stevens, Environmental Coordinator, George Washington NF  
Steve Tanguay, District Biologist, George Washington NF

**Objective:**  
Prioritize crossings from improvement or replacement within a high-priority project area.

**Summary:**  
The Lower Cowpasture River Project Area has been the focus of an intensive management partnership effort on the George Washington National Forest involving local interest groups, citizens, landowners, State agencies, and the George Washington National Forest. One of the goals of the project is to improve or replace road crossing structures that impede fish passage. Increasing the number of connected stream miles increases the health and resilience of local fish populations, such as the Brook Trout. The George Washington NF partnered with the CATT in 2014 to prioritize among crossing improvement options within the project area. We were able to obtain passage status for many crossings in the project area from the CATT passage dataset collected between 2005 and 2009. We visited additional crossings lacking passage information in 2014. The completed dataset was used in a GIS model to prioritize among replacement options. Results from the GIS model will allow the George Washington NF to recommend high-quality improvement projects to its partners.



James River and Warm Springs Ranger Districts



Jump barriers impede fish passage



Crossings come in a variety of shapes and sizes



A passable crossing

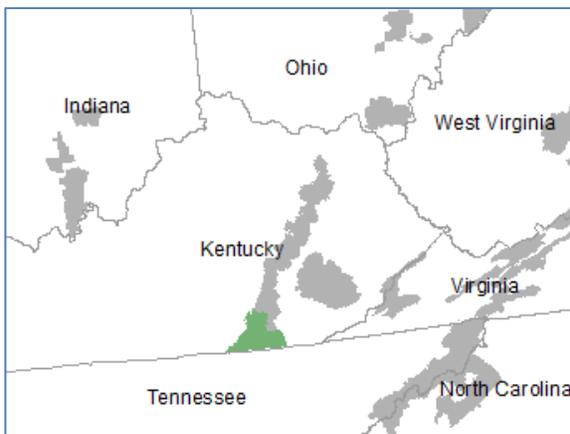
# Daniel Boone National Forest, KY

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

**Partners:** Jon Walker, Forest Hydrologist, DBNF  
Pam Martin, Forest Fishery Biologist, DBNF  
Margueritte Wilson, Remedial Project Manager, Southern Region RO

**Objective:**  
Collect fish and aquatic insects and record stream channel characteristics to examine for impacts of mine drainage 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 habitat may be impacted by mine drainage. Beginning in 2013, the Daniel Boone NF partnered with the CATT to sample stream habitat, fish, aquatic insects, and sediment in stream reaches upstream and downstream of mine drainage areas. We returned in 2014 to sample several additional stream reaches. Results are used to compare stream health in mine affected areas to areas without mining influence and to identify areas for possible remediation.



Stearns Ranger District



Hiking to a sample site



Sorting aquatic insects



A DBNF stream fish

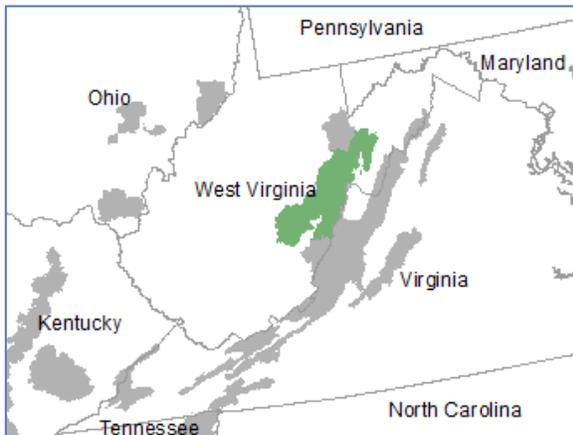
# Monongahela National Forest, WV

**Project:** Aquatic organism passage inventory

**Partners:** Mike Owen, Aquatic Ecologist, Monongahela NF  
Chad Landress, Forest Fishery Biologist, Monongahela NF

**Objective:**  
Determine passage status for road crossing structures on Monongahela National Forest roads

**Summary:**  
Increasing the number of miles of connected stream habitat within watersheds increases the resilience of fish and other aquatic organism populations to short and long-term disturbances. The Monongahela National Forest recently identified several crossings that could impede fish passage on Brook Trout streams. In 2014, they partnered with the CATT to estimate the fish passage potential at each of the crossings. We completed standardized crossing surveys, stream channel measurements, and stream fish collections to determine the potential for fish passage and impacts on local fish communities. The results will be used by the Monongahela NF to prioritize remediation projects.



Gauley, Greenbrier, Marlinton, and Potomac Ranger Districts



Large corrugated metal culvert



Culvert located on abandoned road



Surveying a culvert to assess fish passage

# Southern Research Station, Blacksburg, VA

**Project:** Public outreach program

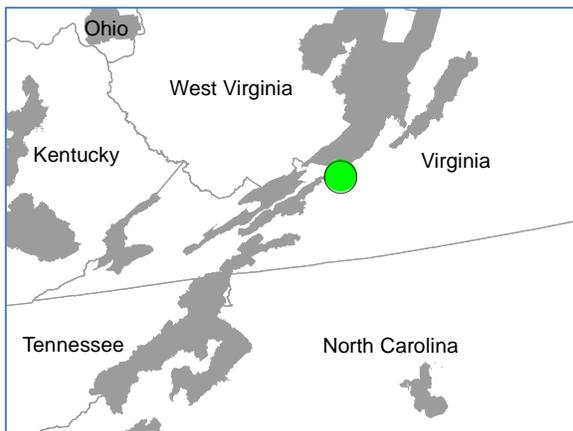
**Partner:** George Washington and Jefferson NF

**Objective:**

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

**Summary:**

Introducing and 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 and Forest Service jobs. In 2014, we participated in a 'Come Out and Play' day on the Jefferson NF. CATT personnel and SRS scientists teamed to develop a streamside display of local fish and crayfish. Interested children and adults were provided with information on the ecology and management of brook trout and other fishes. Participants gained an increased understanding and appreciation for the natural world and the Forest Service mission.



Southern Research Station Lab, Blacksburg, VA



Meeting an American eel



Future fish biologist?



Watching a CATT demonstration

# George Washington National Forest, VA

**Project:** American Eels in headwater mountain streams

**Partners:** Andy Dolloff, Research Fishery Biologist, Southern Research Station  
Dawn Kirk, Forest Fishery Biologist, GWJNF  
Scott Smith, Fishery Biologist, VA Dept. Game & Inland Fisheries

**Objective:**

Describe growth and movement of American Eels in headwater mountain streams

**Summary:**

Though American Eels can live in streams for 20 - 30 years, 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 NF streams. The CATT has worked with Southern Research Station scientists annually since 2000 to collect and tag eels in 2 streams. As of 2014, 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 outreach, attracting the attention of local newspapers, and residents.



Glenwood/Pedlar Ranger District



Collecting American eels



Scanning an American eel for a tag number



Recording weight and length information

## Washington Office

**Project:** Assessing Brook Trout populations using genetic techniques

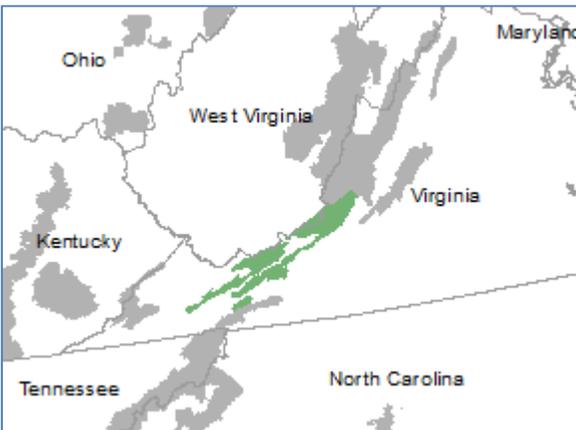
**Partners:** Nat Gillespie, Assistant National Fisheries Program Leader, WO  
Keith Nislow, Research Fishery Biologist, Northern Research Station  
Jason Coombs, University of Massachusetts  
Dawn Kirk, Fishery Biologist, George Washington and Jefferson NF  
Joe Williams, Virginia Department of Game and Inland Fish

**Objective:**

Collect fin clips from Brook Trout in designated southwest Virginia streams

**Summary:**

Brook Trout require cold water, and increasing water temperatures threaten to reduce the number of streams where they can survive, particularly at the southern extent of their range. A large interagency effort is currently underway to determine how many streams will support healthy brook trout populations in the future. In support of this effort, the WO partnered with the CATT to collect small pieces of fins from young brook trout in several streams in southwest Virginia, including streams on the Jefferson National Forest. DNA from these fins will be analyzed by our project partners at the University of Massachusetts and Forest Service Northern Research Station to determine genetic diversity among populations; greater diversity = healthier, more resilient populations. Project results will be used to help prioritize brook trout habitat preservation and restoration efforts in Virginia and elsewhere throughout the native range of brook trout.



Eastern Divide Ranger District



Capturing brook trout



Storing a small piece of fin



Young brook trout

# Ozark National Forest, AR

**Project:** Aquatic organism passage inventory

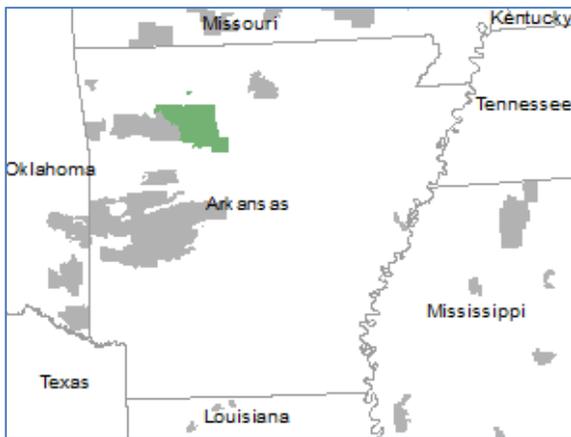
**Partners:** Keith Whalen, Forest Fishery Biologist, Ozark NF

**Objective:**

Complete passage status inventory for entire Ozark National Forest.

**Summary:**

The first step in developing a management strategy often is to understand the scope of the challenge at hand. The Ozark National Forest partnered with the CATT in 2005 to begin a systematic inventory of all its over 2,500 road-stream crossings. We assessed over 1,800 crossings between 2005 and 2009, and an additional 800 crossings in 2014. With the completion of the 2014 assessments the Ozark National Forest now has one of the most comprehensive aquatic organism passage datasets of any National Forest in the Southern Region. We will apply a decision support tool developed by the CATT to the dataset in 2015 to assist the Ozark National Forest in prioritizing crossing improvement projects.



Big Piney Ranger District



Double box culvert with jump barrier



Concrete ford installed at stream grade



Two pipe crossing with jump barrier

# Chattahoochee National Forest, GA

**Project:** Brook Trout habitat inventory

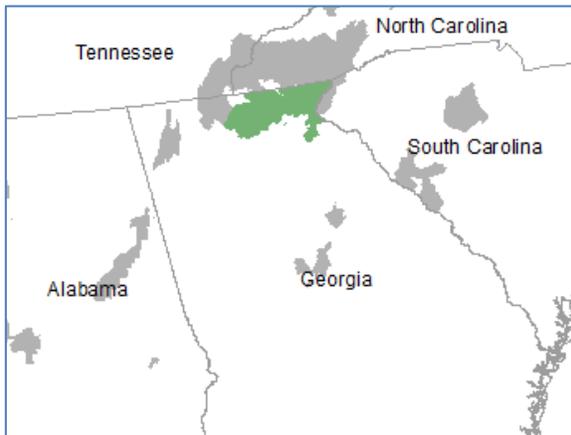
**Partners:** Mike Joyce, Forest Fishery Biologist, Chattahoochee NF

**Objective:**

Assess quality of stream habitat and potential for large wood additions

**Summary:**

The Chattahoochee NF is working to improve stream habitat for Brook Trout through the addition of large 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 Brook Trout streams have died due to recent infestation by an invasive insect, hemlock wooly adelgid. The Chattahoochee NF recognizes the potential for adding the dead hemlocks to increase the depleted large wood supply in many of its trout streams. In 2014, the CATT partnered with the Chattahoochee NF CATT to conduct stream habitat, LW, and riparian inventories along several trout streams on the Forest. The results will be used to target stream reaches with low large wood counts and high hemlock mortality for habitat improvement projects.



Blue Ridge and Chattahoochee River Ranger Districts



Artificial habitat structure on Holcomb Creek



Recently fallen dead hemlock provides trout habitat



New open bottom arch allows trout to swim free

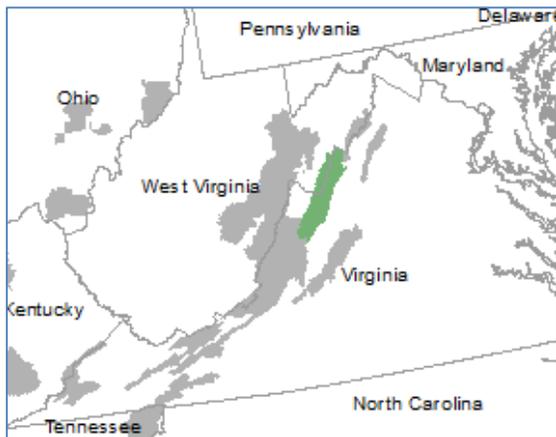
# George Washington National Forest, VA

**Project:** Stream habitat improvement inventory

**Partners:** Dawn Kirk, Forest Fishery Biologist, George Washington NF  
Steve Reeser, Fish Biologist, Virginia Department of Game and Inland Fish

**Objective:**  
Determine effectiveness of stream habitat improvement project

**Summary:**  
A long history of failed attempts to stabilize stream channels dating to the 1950's has left the North River with little in the way of quality trout habitat. The George Washington NF has worked with several partners on a series of stream habitat improvement projects intended to provide more consistent flow and to increase the number and size of pools preferred by the native Brook Trout. Stream habitat inventories completed by the CATT on the North River in the early 2000's, prior to improvement work, allow for a pre- and post-improvement comparison. In 2014, the CATT partnered with the George Washington NF to complete a post-improvement stream habitat assessment. We will produce a report in 2015 to help the George Washington NF determine the effectiveness of their habitat improvement efforts.



North River Ranger District



A previous bank stabilization project



Seasonal dewatering presents challenges for trout



Recent habitat structure addition

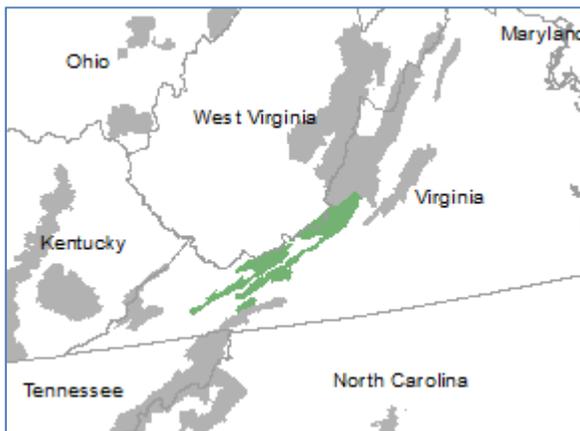
# Jefferson National Forest, VA

**Project:** Large wood movement in headwater mountain streams

**Partners:** Dawn Kirk, Forest Fishery Biologist, GWJNF  
Andy Dolloff, Research Fishery Biologist, Southern Research Station

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

**Summary:**  
Large wood benefits many animals living in and around streams by providing increase food and shelter. Fishery managers often try to maximize the amount of large wood in stream channels. However, large wood may also move during floods, potentially causing property damage. As a result, land managers may remove large wood to protect roads and other structures near streams. In 1993, the Southern Research Station began to study large wood movement in two mountain streams. Pieces of wood were purposely added to streams and their location was recorded. The CATT has surveyed the wood for movement each year since 1995 and maintains the project database. Project results will provide information needed to make decisions regarding large wood management in streams.



Eastern Divide Ranger District



Large wood forming pool



A log jam of large wood



Large wood decay

# Sam Houston National Forest, TX

**Project:** Aquatic organism passage inventory

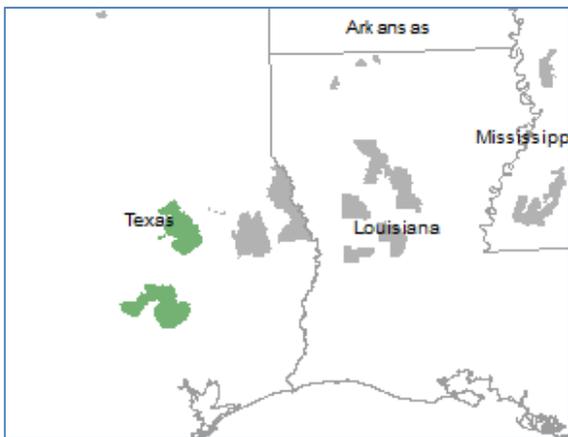
**Partners:** Dave Peterson, Fishery Biologist, NF in Texas

**Objective:**

Assess the potential for upstream fish passage at Sam Houston National Forest road crossings

**Summary:**

Increasing the number of miles of connected stream habitat within watersheds increases the resilience of fish and other aquatic organism populations to short and long-term disturbances. The Sam Houston National Forest recently identified several crossings that could impede fish passage on streams flowing through National Forest managed lands. In 2014, the CATT partnered with the Sam Houston NF to estimate the fish passage potential at each of the crossings. We completed standardized crossing surveys to determine the potential for upstream fish passage. The results will be used by the Sam Houston NF to prioritize stream crossing remediation projects.



Davy Crockett and Sam Houston Ranger Districts



Culvert and outlet pool



Double box culvert



Vented ford with apron

# Shenandoah National Park, VA

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

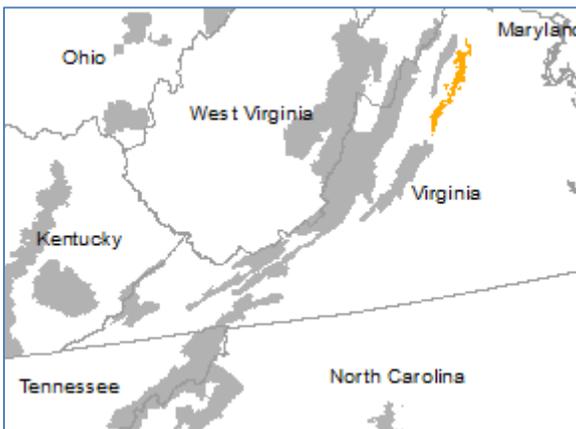
**Partners:** Andy Dolloff, Research Fishery Biologist, Southern Research Station  
Jeb Wofford, Fishery Biologist, Shenandoah National Park

**Objective:**

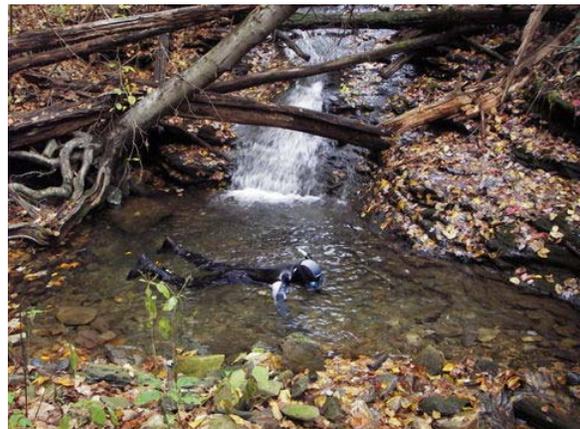
Annually estimate Brook Trout density in two Shenandoah National Park streams in support of a long-term research project in two acid sensitive streams.

**Summary:**

Long term studies allow researchers to describe trends that may not be evident from shorter studies. The Southern Research Station began annually estimating Brook Trout population sizes in two Shenandoah National Park streams in 1993. The CATT has provided field support for the project since 1995 and maintains the project database. Each year we use a combination of diver counts and backpack electrofishing to estimate the Brook Trout population size. Researchers can examine for effects that environmental factors such as acid precipitation, floods, droughts, water temperature, and invasive species may have on Brook Trout distribution and abundance. 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

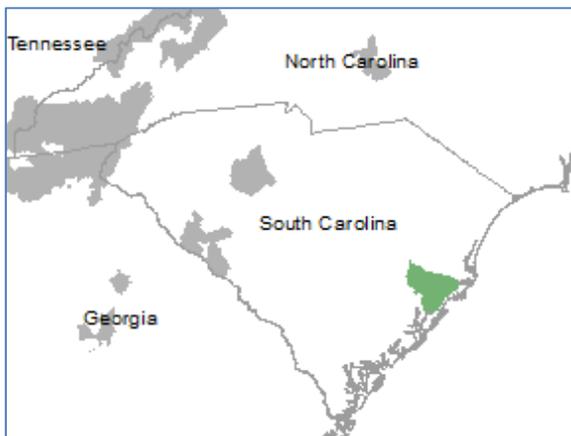
# Francis Marion National Forest, SC

**Project:** Mapping drainages in a coastal plain forest

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

**Objective:**  
Identify potential pathways for 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 NF. The Francis Marion NF is currently using high resolution imagery to map drainages and streams across the entire National Forest. A critical component in the mapping effort is finding locations where streams or wetlands 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 Forest. In 2014, the CATT partnered with the Francis Marion NF to develop and test methods capable of locating pipes buried beneath road fill. In 2015, we will deploy field crews to inventory crossdrain pipes on the Francis Marion NF. The results of the project will be used to develop accurate, precise flow maps for the entire Forest as well as to identify stream and wetland diversions, maintenance problems, and other as yet unknown issues related to the drainage network.



Wambaw/Witherbee Ranger District



A well-hidden 'crossdrain' pipe



Some pipes are easy to locate



Searching for a crossdrain pipe