



CATT

Fiscal Year 2019 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?

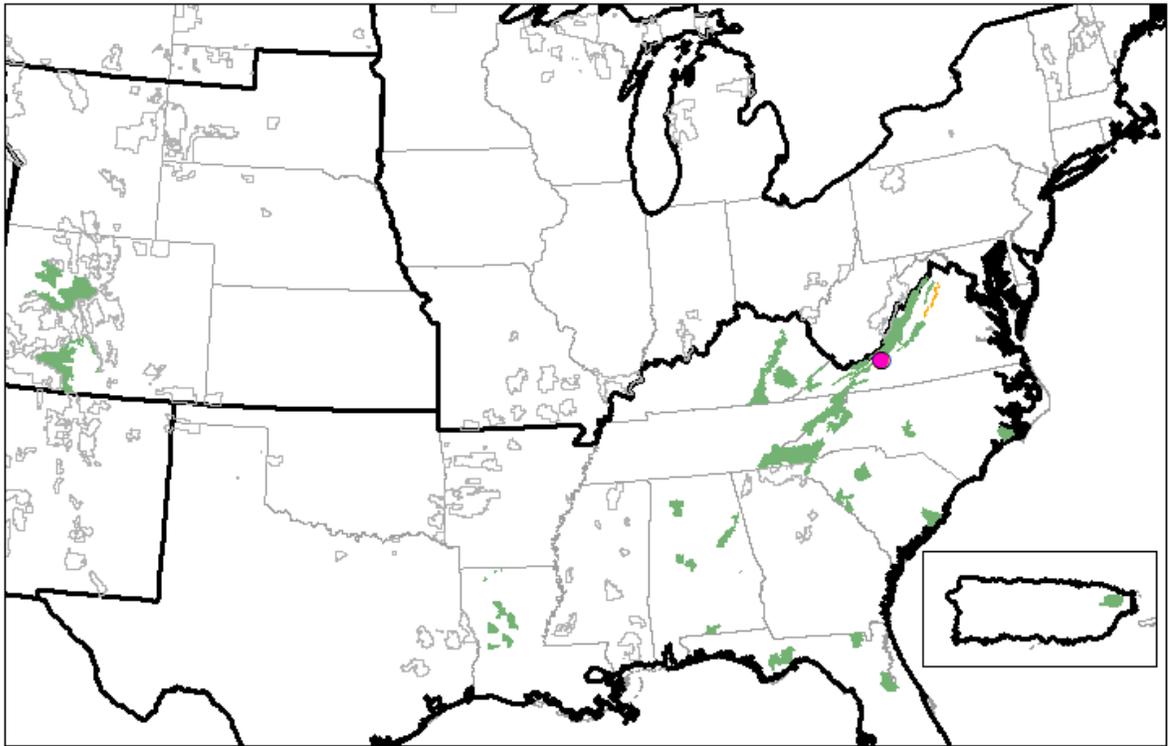
Full-time CATT personnel are stationed in Blacksburg, VA and provide services throughout the U.S.

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 learn more about CATT?

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



CATT field teams worked with partners on several National Forests (green) and a National Park (orange) in fiscal year 2019. The USDA-FS, SRS CATT is headquartered in Blacksburg, VA (magenta circle).

Partner	Project Type
Cherokee National Forest	Road-stream crossing inventory
Daniel Boone National Forest	Mine impacts on stream health
El Yunque National Forest	Post-hurricane stream inventory
Francis Marion & Sumter National Forests	Stream fish and habitat inventory
Francis Marion & Sumter National Forests	Road-stream crossing inventory
Francis Marion & Sumter National Forests	Freshwater mussel monitoring
Francis Marion & Sumter National Forests	Freshwater snorkeling education program
George Washington & Jefferson National Forests	Stream channel classification
George Washington & Jefferson National Forests	Freshwater snorkeling education program
George Washington & Jefferson National Forests	Citizen science for road-stream crossing inventory
George Washington & Jefferson National Forests	Stream habitat improvement monitoring
Kisatchie National Forest	Forest-wide stream monitoring
National Forests in Alabama	Freshwater mussel monitoring
National Forests in Florida	Road inventory and aquatic organism passage
National Forests in North Carolina	Citizen science for road-stream crossing inventory
Rio Grande National Forest	Freshwater snorkeling education program
Shenandoah National Park	Brook Trout population estimates
Southern Region (R8) Regional Office	Provide base funding and support for the CATT
Southern Research Station	American Eel growth and movement
Southern Research Station	Movement of wood in streams
Washington Office	Freshwater snorkeling education program
White River National Forest	Freshwater snorkeling education program

Cherokee National Forest Tellico Ranger District

Project Type

Road-stream crossing inventory

Goal

Provide information needed to prioritize crossing improvement projects in the Tallassee Fund area.

Objectives

Complete road-stream crossing inventory in high-priority watersheds in July 2019

Approach

Forest selects high-priority watersheds for inventory

CATT hires, trains, and deploys field teams to complete standardized crossing assessments

CATT submits data to SARP for inclusion in the regional fish passage barrier database

The Forest, partners, and CATT apply decision support tools to prioritize crossings for replacement

Accomplishments

Assessed 259 crossings

Entered field data into project database

Worked with national forest staff and partners to apply decision support tools

Partners and Contacts

Partner: Southeast Aquatic Resources Partnership (SARP); Forest Contact: Ali Reddington, Forest Hydrologist



An open bottom arch crossing



Assessing a vented ford with multiple pipes

Project Summary

The Forest Service and its partners are engaged in a multi-year effort to identify, assess, prioritize, and remediate road stream crossings in areas of mutual interest. Road-stream crossings that provide for a safe and efficient transportation system, provide resilience to a changing climate, and maximize benefits for aquatic and riparian species are a key component in reaching shared goals. The information collected by CATT field teams will be incorporated into an online prioritization tool to allow resource managers on the Cherokee National Forest and their partners to identify problematic crossings and prioritize among potential remediation projects. The online tool is available at: <https://connectivity.sarpdata.com/>.

Daniel Boone National Forest London Ranger District

Project Type

Mine impacts on stream health

Goal

Assess impacts of an abandoned coal mine on Bear Creek

Objective

Use established monitoring protocols to complete stream fish and habitat samples in summer 2019

Approach

Forest identifies sample sites

CATT hires, trains, and deploys field team to complete sampling

CATT provides data summary and project report

Accomplishments

Completed sampling at 8 sites

Entered data into project database

Project report in progress

Partners and Contacts

Forest Contacts: Claudia Cotton, Forest Hydrologist



Coal mine tailings and acid mine drainage



Drainage from coal mine slurry pond to stream

Project Summary

Many areas within the boundaries of the Daniel Boone National Forest were once part of mining operations, and legacy mines have the potential to impact stream health. The Daniel Boone National Forest and Southern Region Regional Office are working to identify and remediate areas impacted by legacy mines. Bear Creek, a headwater tributary of the Rock Castle River in the Cumberland River watershed, drains lands containing legacy coal mines that may be impacting water quality and stream health. We collected fish and aquatic insects, measured substrate particles, and recorded stream characteristics to assess the overall health of Bear Creek. The Daniel Boone National Forest will use the information to prioritize among mine remediation projects across the forest.

El Yunque National Forest

Project Type

Post-hurricane stream inventory

Goal

Gather information needed to assess the status of stream biota in the wake of 2017 hurricanes

Objectives

Complete stream biota inventories within El Yunque watersheds by November 2018

Compare post-hurricane results with pre-hurricane information

Approach

Forest, partners, and CATT identify location of previous sample sites

CATT and partners hire, train, and deploy field team to complete inventories

CATT prepares report comparing pre- and post-hurricane results

Accomplishments

Completed 19 habitat samples on 17 streams and 22 fish samples on 20 streams in 2018 – 2019

Data analysis and project report completed in FY19

Partners and Contacts

Partners: North Carolina Cooperative Fish & Wildlife Research Unit, NC State University, Student Conservation Association; Forest Contacts: Jessica Ilse, Forest Biologist; Pedro Rios, Natural Resources Staff Officer



Assessing post-hurricane fish communities



Measuring stream habitat

Project Summary

Hurricane Maria made landfall on Puerto Rico as a powerful category 4 hurricane in September 2017, bringing catastrophic damage to much of the island. The mountainous terrain of El Yunque National Forest was not spared from Maria's destructive winds and rains. Roads and facilities were damaged, power was lost, and many water supply intakes located on the forest were damaged by flood waters and landslides. We collected biological (fish, shrimp, and crab) and physical habitat data at post-hurricane sample sites in 12 watersheds from Aug – Oct, 2018 and compared our results to data collected before the hurricane at the same sample sites. Key results include: the majority of sample sites had similar native species diversity before and after the hurricane; the abundance and biomass of native species was generally lower post-hurricane, and; non-native species were found at more sites following the hurricane. The project report is available at: https://www.srs.fs.usda.gov/catt/pdf/pr/2019_pr_catt_report.pdf.

Francis Marion & Sumter National Forests

Enoree Ranger District

Project Type

Stream fish and habitat inventory

Goal

Provide stream biota and habitat information needed for project-level and forest-level planning

Objective

Complete stream fish and habitat inventory in summer 2019

Approach

Forest identifies streams with gaps in fish or habitat information
The CATT trains and deploys field teams to complete inventories
The CATT provides project database for incorporation into forest datasets

Accomplishments

Completed 17 miles of inventory on 36 streams
Sampled fish in 7 streams
Entered data into project database and provided to project partner

Partners and Contacts

Forest Contact: Keith Whalen, Forest Fisheries Biologist



Beaver dam encountered during habitat inventory



Dry 'underground' stream channel

Project Summary

Periodic aquatic resource assessments provide the information national forest managers need to effectively identify current status and trends, management options and impacts, and threats and impacts of fire, insects, disease, and other natural processes on aquatic resources. In 2019, Sumter National Forest partnered with the CATT to assess stream habitat and fish in high-priority management areas, the latest effort in a long history of inventory and monitoring partnerships on the forest. Our current effort is intended to fill data gaps and update aquatic resource information needed for forest- and project-level analyses. We will return to the Sumter in 2020 to continue stream assessments in high priority watersheds identified by the Sumter National Forest.

Francis Marion & Sumter National Forests

Long Cane Ranger District

Project Type

Road-stream crossing inventory

Goal

Provide information needed to prioritize road-stream crossing improvement projects

Objectives

Complete road-stream crossing inventory in high-priority watersheds in 2019

Approach

Forest selects high-priority watersheds for inventory

CATT hires, trains, and deploys field teams to complete standardized crossing assessments

Forest, partners, and CATT apply decision support tools to prioritize crossings for replacement

Accomplishments

Assessed 116 crossings

Entered field data into project database

Worked with national forest staff and partners to apply decision support tools

Partners and Contacts

Forest Contact: Keith Whalen, Forest Fisheries Biologist



Assessing crossing alignment



Checking fish passage at an open bottom arch

Project Summary

A safe and efficient transportation system that is resilient to extreme weather events and provides benefits for aquatic species simultaneously addresses several Forest Service strategic objectives. In 2019, the Sumter National Forest partnered with the CATT to begin a targeted assessment of road crossings (e.g. bridges, culverts, fords) within high priority watersheds. CATT teams inventoried crossings, assessed structures, and completed fish passage surveys and assessments at all crossing with the potential to block fish movement. The information collected by CATT field teams will be incorporated into an online prioritization tool to allow resource managers on the Sumter National Forest and their partners to identify problematic crossings and prioritize among potential remediation projects. The online tool is available at: <https://connectivity.sarpdata.com/>.

Francis Marion & Sumter National Forests

Andrew Pickens Ranger District

Project Type

Freshwater mussel monitoring

Goal

Assess Chattooga River mussel populations for changes in distribution or abundance

Objectives

Re-survey Chattooga River mussels at 12 monitoring sites in summer 2019

Approach

SRS scientists and CATT design mussel monitoring sample design in 2005

CATT hires, trains, deploys field team to complete re-survey of mussel population at regular intervals

CATT and SRS scientists complete population estimates to examine for trends in mussel populations

Accomplishments

Chattooga monitoring methods developed in 2005

Initial population estimated completed in 2012

Re-survey completed in summer 2019

Data analysis and project report underway

Partners and Contacts

Wendell Haag, Southern Research Station; Forest Contact: Keith Whalen, Forest Fisheries Biologist



Alasmidonta varicosa (Brook floater)



A species of Elliptio mussel

Project Summary

Freshwater mussels are one of the most imperiled groups of aquatic animals in the southeastern U.S. The Chattooga River supports several species of freshwater mussels, including the Brook Floater (*Alasmidonta varicosa*), a species of Special Concern in South Carolina. The Brook Floater is at the southern extent of its range in the Chattooga River. While many other populations are in decline, the Chattooga River is believed to contain one of the largest and most viable remaining populations of Brook Floater. The CATT and SRS mussel specialists worked with the Sumter National Forest in 2005 to design mussel monitoring protocols for the Chattooga River. We completed a baseline mussel population estimate in 2012 and returned in 2019 to complete a second estimate for comparison. Our results will be used by the Sumter National Forest to determine the trajectory of mussel populations in the Chattooga River and to develop appropriate management strategies as needed.

Francis Marion & Sumter National Forests

Andrew Pickens Ranger District

Project Type

Freshwater snorkeling education program

Goal

Connect participants to nature by immersing them in streams and rivers

Objectives

Launch the Francis Marion & Sumter National Forest freshwater snorkeling education program with a week-long program on the Chattooga River in fall 2019

Approach

Forest staff and CATT select appropriate snorkeling sites

Andrew Pickens staff contacts local schools

CATT hires, trains, deploys snorkeling education team to Sumter National Forest

CATT, NorthBay, and Forest staff host several snorkeling events

Accomplishments

Identified a safe and suitable snorkeling location

Found local schools to participate

Hosted 83 students from 3 local schools

Partners and Contacts

Partner: NorthBay Foundation; Forest Contact: Keith Whalen, Forest Fisheries Biologist



Snorkeling in the Chattooga River



Collecting macroinvertebrates

Project Summary

Connecting people to the outdoors is an increasingly important and challenging part of the Forest Service mission. Snorkeling education programs are an innovative and effective way to connect people to the outdoors, engage partners in impactful outreach programs, and deliver conservation messages through a nature immersion experience. In 2019, FMSNF partnered with the CATT and NorthBay to host events on the upper Chattooga River for local middle school and high school classes. Students and teachers donned wetsuits, masks, and snorkels to view fish and aquatic insects in their natural habitats. Their observations formed a foundation for discussing the roles of individuals, communities, and agencies in maintaining healthy watersheds that produce abundant, clean water. Given the positive feedback their program received, the Sumter National Forest anticipates hosting additional snorkeling events in 2020.

George Washington & Jefferson National Forests Eastern Divide, Clinch, and North River Ranger Districts

Project Type

Stream channel classification

Goal

Provide information needed to provide adequate stream channel protection in timber management units

Objective

Classify stream channels in timber management units in 2019

Approach

Forest provides list of timber units with pending harvest

CATT works with forest and districts staffs to develop standardized classification system

CATT deploys field teams to classify stream channel

CATT supplies project GIS to forest

Accomplishments

Classified stream channels in 111 timber stand sale units within 22 sale areas across 3 districts

Submitted maps of classifications to district and forest personnel

Partners and Contacts

Forest Contacts: Dawn Kirk, Forest Fisheries Biologist; Pauline Adams, Forest Hydrologist



Assessing riparian characteristics



Classifying a headwater channel

Project Summary

Functioning riparian areas are important in all aquatic habitats. The George Washington and Jefferson National Forest seeks to retain, restore, or enhance ecological and physical processes and functions of riparian areas along all perennial, intermittent, and ephemeral streams and wetlands by identifying, classifying, and delineating all stream channels within the project areas of timber management units. Central to this goal is the ability to accurately and efficiently identify perennial, intermittent, and channeled ephemeral streams. The forest has partnered with the CATT to develop and apply a standardized approach for stream channel classification. We developed a field guide to channel classification and then hired, trained, and deployed field teams to classify channels in timber management units across the George Washington and Jefferson National Forests. The Forest uses the classifications to lay out Riparian Corridors and Channeled Ephemeral Zones in timber management units, as prescribed in the forest plan.

George Washington & Jefferson National Forests Lee Ranger District

Project Type

Freshwater snorkeling education program

Goal

Connect participants to nature by immersing them in streams and rivers

Objectives

Host a 5-day snorkeling program on Passage Creek in October, 2018

Approach

Forest staff, CATT, and Friends of the Shenandoah River select appropriate snorkeling sites
National Park Trust contacts schools and arranges for bus transportation
CATT hires, trains, deploys snorkeling education team to implement snorkeling program
CATT, Forest staff, WO staff, partners host a series of snorkeling events

Accomplishments

Identified a safe and suitable snorkeling location
Hosted 272 students from 5 Washington DC schools
Identified partners to take the lead on future programs

Partners and Contacts

Partners: Friends of the Shenandoah River, National Park Trust, NorthBay Foundation, Audubon Society;
Forest Contact: Dawn Kirk, Forest Fisheries Biologist; Pauline Adams, Forest Hydrologist



Learning the fish species seen while snorkeling



Collecting macroinvertebrates

Project Summary

Connecting people to the outdoors is an increasingly important and challenging part of the Forest Service mission. Snorkeling education programs are an innovative and effective way to connect people to the outdoors, engage partners in impactful outreach programs, and deliver conservation messages through a nature immersion experience. For a second consecutive year we worked with the GWJNF and several partners to host multiple freshwater snorkeling events. Grade school and middle school students from Washington DC donned wetsuits, masks, and snorkels to view fish and aquatic insects in their natural habitats. Their observations formed a foundation for discussing the roles of individuals, communities, and agencies in maintaining healthy watersheds that produce abundant, clean water. Given the positive feedback their program received, the Forest anticipates hosting additional snorkeling events in 2019.

George Washington & Jefferson National Forests Eastern Divide Ranger District

Project Type

Citizen science for road-stream crossing inventory

Goal

Add capacity to road-stream crossing inventory efforts by incorporating citizen scientists

Objectives

Train teams of citizen scientists to complete road-stream crossing inventories in summer 2019

Approach

Southeast Aquatic Resources Partnership produces field methods, phone application, and database

Trout Unlimited identifies volunteer citizen scientists

CATT trains citizen scientists

Data collected by citizen scientists is used to prioritize crossing replacement project using online tool

Accomplishments

Partners and Forest Service identified high-priority watersheds

CATT trained 6 citizen scientists

Citizen scientists are currently collecting data

Partners and Contacts

Partners: Southeast Aquatic Resources Partnership, Trout Unlimited; Forest Contact: Dawn Kirk, Forest Fisheries Biologist; Pauline Adams, Forest Hydrologist



Checking for substrate within crossing structure



Measuring structure height

Project Summary

Identification and remediation of road-stream crossings that impede the movement of aquatic biota in high-priority watersheds are key components to watershed-level restoration. A complete census of road-stream crossings is challenging given the high number of crossings and mixed land ownership in many eastern watersheds. The U.S. Forest Service, Trout Unlimited, and the Southeast Aquatic Resources Partnership recently began sharing inventory techniques, data management approaches, and project prioritization tools in an effort to improve efficiency and reduce redundancy among our respective aquatic passage programs. In 2019, we trained and deployed teams of Trout Unlimited volunteers to assess crossings in watersheds of shared interest and upload results into an online prioritization tool. The online tool is available at: <https://connectivity.sarpdata.com/>.

George Washington & Jefferson National Forests North River Ranger District

Project Type

Stream habitat improvement monitoring

Goal

Monitor for changes in stream habitat in the North River related to multiple habitat restoration projects

Objectives

Determine effectiveness of stream habitat improvement projects on the North River by completing pre- and post-improvement stream habitat inventories

Approach

Forest Service and partners apply stream restoration techniques to North River
CATT provides before- and after-improvement stream habitat assessments

Accomplishments

Completed 7 miles of habitat inventories in summer 2019
Data analysis and report preparation is in progress

Partners and Contacts

Partners: Virginia Department of Game and Inland Fisheries; Forest Contacts: Dawn Kirk, Forest Fisheries Biologist; Pauline Adams, Forest Hydrologist



A section of dry 'underground' channel



Pool depths maintained by installed fish structure

Project Summary

The North River has been subjected to extensive channel modifications over the past 70 years. Following catastrophic flooding in 1949 large portions of the river above Elkhorn Lake were channelized, and throughout the 1950's and 60's gabion walls, wings, and deflectors were installed a 5.5 mile reach. The structures caused extensive down-cutting and loss of habitat complexity, resulting in frequent drying throughout the reach. In the early 2000's a multi-year habitat improvement effort began with the installation of rock and wood structures intended to create and maintain pools where trout can find refuge during periods of low flow. The GWJNF partnered with CATT to complete stream habitat assessments both before and after habitat improvement projects. In 2019, we returned to complete another round of assessments following additional stream habitat improvement work. Our results will be used to assess the effectiveness of habitat improvement work throughout the project area.

Kisatchie National Forest

Calcasieu, Caney, Catahoula, Kisatchie, and Winn Ranger Districts

Project Type

Forest-wide stream monitoring

Goal

Provide information needed for project-level and forest-level planning

Objective

Complete stream fish and habitat samples following established monitoring protocols in spring 2019

Approach

Forest, CATT, and partners document standardized methods for collecting monitoring data

Forest selects monitoring locations distributed across entire national forest

CATT deploys field teams to collect fish and habitat data

CATT supplies project database to partner at Louisiana State University for data analysis

Accomplishments

Produced updated monitoring methods document

Collected monitoring data at 21 sites across 5 districts

Sent project database to LSU for data analysis

Partners and Contacts

Partner: Louisiana State University; Forest Contacts: Ted Soileau, Natural Resource Specialist; David Byrd, Staff Officer



Collecting fish at a long-term monitoring site



Seining to collect additional fish

Project Summary

The Kisatchie National Forest has a need to assess long-term status and trends in aquatic species and to determine the effectiveness of land management actions in maintaining or restoring aquatic habitats and resources. In 2016, the Kisatchie National Forest requested a review of their long-term stream monitoring program; CATT biologists worked with forest staff and partners at LSU to evaluate and update stream monitoring methods and plan a 4-year effort to collect data at all existing long-term monitoring sites. This long-term, forest-wide monitoring project compares current conditions with those observed over previous decades of monitoring. The latest round of monitoring data collection will be completed in 2020 and will provide the national forest with information needed to determine impacts of current land management practices on aquatic biota.

National Forests in Alabama Conecuh Ranger District

Project Type

Freshwater mussel monitoring

Goal

Update distribution of mussel species in rivers and streams on Conecuh Ranger District

Objective

Assess the distribution and relative abundance of mussels in Five Runs River in summer 2019

Approach

National Forests in Alabama identifies data gaps in mussel dataset
CATT provides field team to assist Forest staff with mussel surveys

Accomplishments

Completed mussel inventories on a 6 mile reach of Five Runs River

Partners and Contacts

Forest Service Contact: John Moran, Forest Fishery Biologist



Snorkeling to search for mussels



Mussels are identified and measured

Project Summary

The southeastern U.S. is home to the highest diversity of freshwater mussels on the entire planet, but many species are rare or imperiled. In areas with active land management a clear understanding of the distribution and relative abundance of mussel species is imperative for avoiding adverse impacts to remaining populations. In 2019, the National Forests in Alabama partnered with CATT to complete a qualitative assessment of mussel distribution and abundance in Five Runs River on the Conecuh Ranger District. The results will be used to fill data gaps and update aquatic resource information needed for forest- and project-level analyses.

National Forests in Florida

Apalachicola Ranger District

Project Type

Effect of roads on hydrology and aquatic organism passage

Goal

Assess the impacts of the forest road system on hydrology and aquatic organism passage

Objective

Complete inventory and assessment of drainage structures beneath forest roads, then assess fish passage at priority crossings

Approach

Forest identifies roads within the Apalachicola Regional Restoration Initiative area in need of assessment
CATT and forest work together to develop drainage structure inventory methods
CATT field team collects and submits data for forest
Forest uses data to identify areas in need of restoration or maintenance

Accomplishments

Assessed 182 miles of roads; Identified and assessed 40 crossdrain structures, 258 waterbody crossing structures, and 504 miscellaneous features; completed AOP assessments at 23 crossings

Partners and Contacts

Forest Contacts: Jason Drake, Forest Ecologist; Paul Medley, GIS Program Manager; Jorge Guevara, Hydrologist; Jordan Nickle, GIS Analyst; John Dunlap, Forest Wildlife Biologist



Searching for drainage structures



Assessing fish passage potential

Project Summary

Determining the direction of water flow across extremely flat landscapes such as coastal plains can be very difficult. The Apalachicola NF has a need to delineate and map watersheds across the Apalachicola Regional Restoration Initiative area but is hampered by a lack of accurate drainage and flow network information. A critical component in the mapping effort is locating where water flow is impeded or modified by roads and trails; the only way to identify these 'crossdrains' is through an intensive search and mapping effort on the 800+ miles of roads in the project area. In 2018-2019, the Apalachicola NF partnered with the CATT to deploy field crews to inventory crossdrain structure (pipes, etc.) and assess aquatic organism passage at road crossings. Project results will be used to complete watershed drainage maps, locate stream and wetland diversions, identify maintenance problems, and opportunities for remediation projects.

National Forests in North Carolina Pisgah Ranger District

Project Type

Citizen science for road-stream crossing inventory

Goal

Add capacity to road-stream crossing inventory efforts by incorporating citizen scientists

Objectives

Train teams of citizen scientists to complete road-stream crossing inventories in summer 2019

Approach

Southeast Aquatic Resources Partnership produces field methods, phone application, and database

Trout Unlimited identifies volunteer citizen scientists

CATT trains citizen scientists

Data collected by citizen scientists is used to prioritize crossing replacement project using online tool

Accomplishments

Southeast Aquatic Resources Partnership, Trout Unlimited, and USFS identified high-priority watersheds

CATT trained 8 citizen scientists

Citizen scientists are currently collecting data

Partners and Contacts

Partners: Southeast Aquatic Resources Partnership, Trout Unlimited; Forest Contact: Sheryl Bryan, Forest Fisheries Biologist; Brady Dodd, Forest Hydrologist



Citizen scientists learning about natural fords



Measuring box culvert width

Project Summary

Identification and remediation of road-stream crossings that impede the movement of aquatic biota in high-priority watersheds are key components to watershed-level restoration. A complete census of road-stream crossings is challenging given the high number of crossings and mixed land ownership in many eastern watersheds. The U.S. Forest Service, Trout Unlimited, and the Southeast Aquatic Resources Partnership recently began sharing inventory techniques, data management approaches, and project prioritization tools in an effort to improve efficiency and reduce redundancy among our respective aquatic passage programs. In 2019, we trained and deployed teams of Trout Unlimited volunteers to assess crossings in watersheds of shared interest and upload results into an online prioritization tool. The online tool is available at: <https://connectivity.sarpdata.com/>.

Rio Grande National Forest Divide Ranger District

Project Type

Freshwater snorkeling education program

Goal

Connect participants to nature by immersing them in streams and rivers

Objectives

Launch the Forest's snorkeling education program with an event on the Rio Grande River in fall 2019

Approach

Forest staff and NorthBay select appropriate snorkeling sites

District staff contacts local schools

CATT, NorthBay, and Forest staff host snorkeling event

Accomplishments

Identified a safe and suitable snorkeling location

Found local school to participate

Hosted 7 students from local high school

Partners and Contacts

Partner: NorthBay Foundation; Forest Contacts: Jason Remshardt, Forest Fisheries Biologist; Bill Janowsky, Regional Fisheries Biologist



Suited up and excited to snorkel



Observing fish

Project Summary

Connecting people to the outdoors is an increasingly important and challenging part of the Forest Service mission. Snorkeling education programs are an innovative and effective way to connect people to the outdoors, engage partners in impactful outreach programs, and deliver conservation messages through a nature immersion experience. In 2019, the Rio Grande National Forest partnered with the CATT and NorthBay to pilot their freshwater snorkeling program with an inaugural event on the Rio Grande River. Students and teachers from Del Norte High School donned wetsuits, masks, and snorkels to view fish and aquatic insects in their natural habitats. Their observations formed a foundation for discussing the roles of individuals, communities, and agencies in maintaining healthy watersheds that produce abundant, clean water. Given the positive feedback their program received, the Forest anticipates hosting additional snorkeling events in 2020.

Shenandoah National Park National Park Service

Project Type

Brook Trout population monitoring

Goal

Use long-term population monitoring to better inform Brook Trout management

Objective

Complete annual population estimates on 2 long-term study streams in 2019

Monitor annual growth and movement on 1 long-term study stream in 2019

Incorporate results into 27-year dataset

Approach

Southern Research Station establishes long-term monitoring study in 1993

Shenandoah National Park supplies research and sampling permits

CATT provides personnel and organizes volunteers to support annual sampling efforts

Southern Research Station produces presentations, reports, papers based on results

Accomplishments

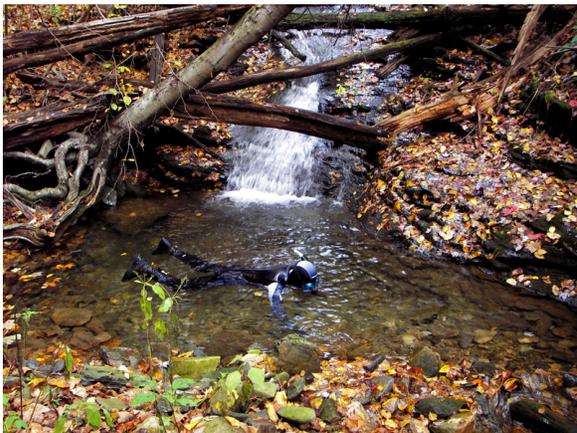
Completed population estimates on 2 long-term study streams

Completed growth and movement sampling on 1 long-term study stream

Data are incorporated into project database

Partners

Partner: Shenandoah National Park; Forest Service Contact: Dr. Andy Dolloff, Southern Research Station



Snorkeling to count fish



Measuring a Brook Trout

Project 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 populations. Understanding such effects allows resource specialists to more effectively manage Brook Trout and other coldwater fish populations.

USFS Southern Region (R8) Regional Office (RO)

Project Type

Base funding, coordination, and support for the CATT

Goal

Provide science-based support to national forests in the Southern Region to address aquatic-related management challenges

Objective

Support 2 CATT biologists to work on projects throughout R8 in 2019

Approach

Regional Office provides support for 2 full-time CATT biologists
Southern Research Station provides CATT facility and administrative support
National forests, RO, or other partners request CATT services
CATT works with partners to develop and implement custom solutions

Accomplishments

Partnered with 9 national forests in R8 on 15 field projects;
Acquired additional funding for projects on 2 national forests in R2
Partnered with Virginia Tech to hire, train, and deploy up to 5 field technicians
Shared project information through reports, webinars and at local, state, and national meetings

Partners and Contacts

Partner: Virginia Tech; Forest Service Contacts: Keith Whalen, Regional Fish Program Manager (acting); Kevin Leftwich, Regional Aquatic Ecologist; Gretta Boley, Director, R8 Biological and Physical Resources; Andy Dolloff, Southern Research Station



Planning a stream inventory with NFS personnel



Presenting project results to forest staff

Project Summary

Managing for abundant clean water and resilient 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 Southern Region Regional Office allows us to address this need. Base funds are used to support 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 provides a variety of on-demand services throughout the Region. Our partnership with the Regional Office ensures that we will be well positioned to meet the needs of National Forests in Region 8.

Southern Research Station Research Work Unit 4353, Blacksburg, VA

Project Type

American Eel growth and movement

Goal

Use long-term monitoring to better inform American Eel conservation and management efforts

Objective

Complete annual eel sample at long-term study site in 2019
Incorporate results into 20-year dataset

Approach

Southern Research Station establishes long-term monitoring study on Tye River in 2000
George Washington and Jefferson National Forest and State supply research and sampling permits
CATT provides personnel and organizes volunteers to support annual sampling efforts
Southern Research Station produces presentation, reports, and papers based on results

Accomplishments

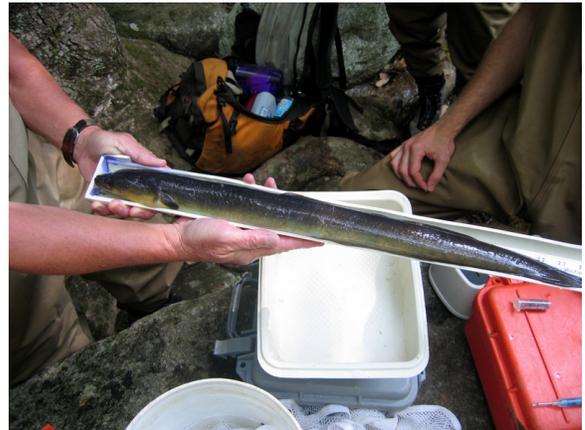
Completed annual eel sampling on 1.2 mile study section of Tye River
Incorporated data into long-term dataset

Partners and Contacts

Partner: Virginia Department of Game and Inland Fisheries; Forest Service Contacts: Dr. Andy Dolloff, Southern Research Station; Dawn Kirk, Forest Fisheries Biologist



Collecting eels on the South Fork Tye River



Measuring an American Eel

Project 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 often attracts the attention of local residents and media, providing the opportunity to for outreach about eels and forest management.

Southern Research Station Research Work Unit 4353, Blacksburg, VA

Project Type

Movement of wood in streams

Goal

Monitor long-term movement of wood in small trout streams to better inform watershed management

Objective

Locate marked logs in 2019 and incorporate location information into 27-year dataset

Approach

Southern Research Station designs and implements log movement study in 1993

Jefferson National Forest provides personnel to place logs into streams in 1993

CATT provides personnel annually to document changes in log location

CATT updates long-term dataset

Accomplishments

Located 150 study logs in 2 long-term study stream reaches

Incorporated data into long-term dataset

Partners and Contacts

Forest Service Contacts: Andy Dolloff, Southern Research Station; Dawn Kirk, Forest Fisheries Biologist



Documenting movement of wood



Searching for a marked piece of wood

Project 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.

White River National Forest Dillon Ranger District

Project Type

Freshwater snorkeling education program

Goal

Connect participants to nature by immersing them in streams and rivers

Objectives

Launch the White River National Forest freshwater snorkeling education program with an event on the Blue Valley Ranch in fall 2019

Approach

Forest staff and NorthBay select appropriate snorkeling sites
District staff contacts local schools
CATT, NorthBay, and Forest staff host a snorkeling event

Accomplishments

Identified a safe and suitable snorkeling location
Found local schools to participate
Hosted 25 students from a local high school

Partners and Contacts

Partner: Blue Valley Ranch, NorthBay Foundation; Forest Contacts: Mark Hane, East Zone Fisheries Crew Lead; Bill Janowsky, Regional Fisheries Biologist



Suited up and excited to snorkel



Collecting macroinvertebrates

Project Summary

Connecting people to the outdoors is an increasingly important and challenging part of the Forest Service mission. Snorkeling education programs are an innovative and effective way to connect people to the outdoors, engage partners in impactful outreach programs, and deliver conservation messages through a nature immersion experience. In 2019, the White River National Forest partnered with the CATT, NorthBay, and Blue Valley Ranch to pilot their snorkeling program. Students and teachers from a local high school donned wetsuits, masks, and snorkels to view fish and aquatic insects in the Blue River. Their observations formed a foundation for discussing the roles of individuals, communities, and agencies in maintaining healthy watersheds that produce abundant, clean water. Given the positive feedback their program received, the Forest anticipates hosting additional snorkeling events in 2020.