Little Tennessee Native Fish Conservation Partnership

2017 Accomplishment Report

2017 saw many of the partnership's projects come to fruition or make significant strides. Many of which, like video-shorts and the web mapper, lay the groundwork for future projects and success.

Snorkeling - Mainspring Conservation Trust and the Eastern Band of Cherokee Indians began using snorkeling equipment for public events- held 4 snorkeling events (Little TN, Tuck, Cheoah) and one in the Oconaluftee

Videos - Coordinated by Mainspring Conservation Trust, Freshwaters Illustrated captured video for movie-shorts to be unveiled in 2018

Signage - Three signs on Shade Your Stream, Watershed, and Fishes of the Little Tennessee were installed at a park in the basin.

Shade Your Stream - Re-printed Shade Your Stream brochure with county specific contact information. 1000 copies per county (Rabun, Macon, Jackson, Swain, Graham)

Restoration - Mainspring Conservation Trust led efforts to live-stake approximately 3000 linear feet of streambank

Restoration - Mainspring Conservation Trust coordinated efforts to remove two barriers to brook trout in Jackson County along Slatten Branch. Extended upstream range for that population.

Web Mapper/Story Map - American Rivers has co-led with the US Fish and Wildlife Service an effort to develop an online conservation map for resource managers and a Story Map for the general public. The Story Map will provide information on the biodiversity in the river, access points, and ways to improve river health. The conservation mapper will help resource managers prioritize conservation efforts to improve the health of the Little Tennessee River. This mapping work is funded by a grant to the NC Wildlife Federation from the Duke Water Resources Fund.

Staffing - American Rivers was awarded $24,000 from the Tallassee Fund and $52,500 from the NC Clean Water Management Trust Fund to expand staff capacity to identify and pursue high priority restoration and protection work in the Little Tennessee River basin in North Carolina and Tennessee. This work will support partner organizations and members of the NFCA in their efforts to work on the highest priority projects in the basin.

Grant Conclusion - About to complete final report to Duke on our grant. Basically we spent the grant amount and accomplished the project within budget.

What is the Little Tennessee Native Fish Conservation Partnership?

A group of local, state, and national organizations that recognize the significance of the river basin's streams and are working with local communities to conserve stream life and develop stream-based economic opportunity.

About Little Tennessee River Basin

The Little Tennessee River Basin stretches from northeast Georgia, across North Carolina, into east Tennessee and includes the Little Tennessee River itself, as well as the Tuckasegee, Nantahala, Cheoah, Oconaluftee, and Tellico rivers, and myriad smaller tributaries.

When it comes to aquatic life, this basin is one of the most diverse in the nation with more than 100 species of native fish, 10 species of native mussels and a dozen native crayfish species. It's home to 32 fish, mussel, or crayfish species considered rare at the federal or state level, including a handful found nowhere else in the world like the Citico darter , Smoky madtom, and Little Tennessee crayfish.

The basin's streams are also important as a recreational and economic resource. Numerous native sport fishes including brook trout, rock bass, smallmouth bass, and flathead catfish bring significant angling dollars to the region. Fishing and other recreational activities such as canoeing, white-water rafting, swimming, tubing and wildlife watching are vital to the region, with the Nantahala and Cheoah rivers being nationally-known paddling destinations.

Photo: Little Tennessee River. Credit: USFWS

Accomplishments of the Partnership member organizations in the basin

American Rivers

- Organized a Tuckasegee River Conservation Visioning Group to support conservation efforts in the subbasin of the Little Tennessee River. This group will focus on land protection, river restoration, community access, and community engagement in and along the Tuckasegee River.

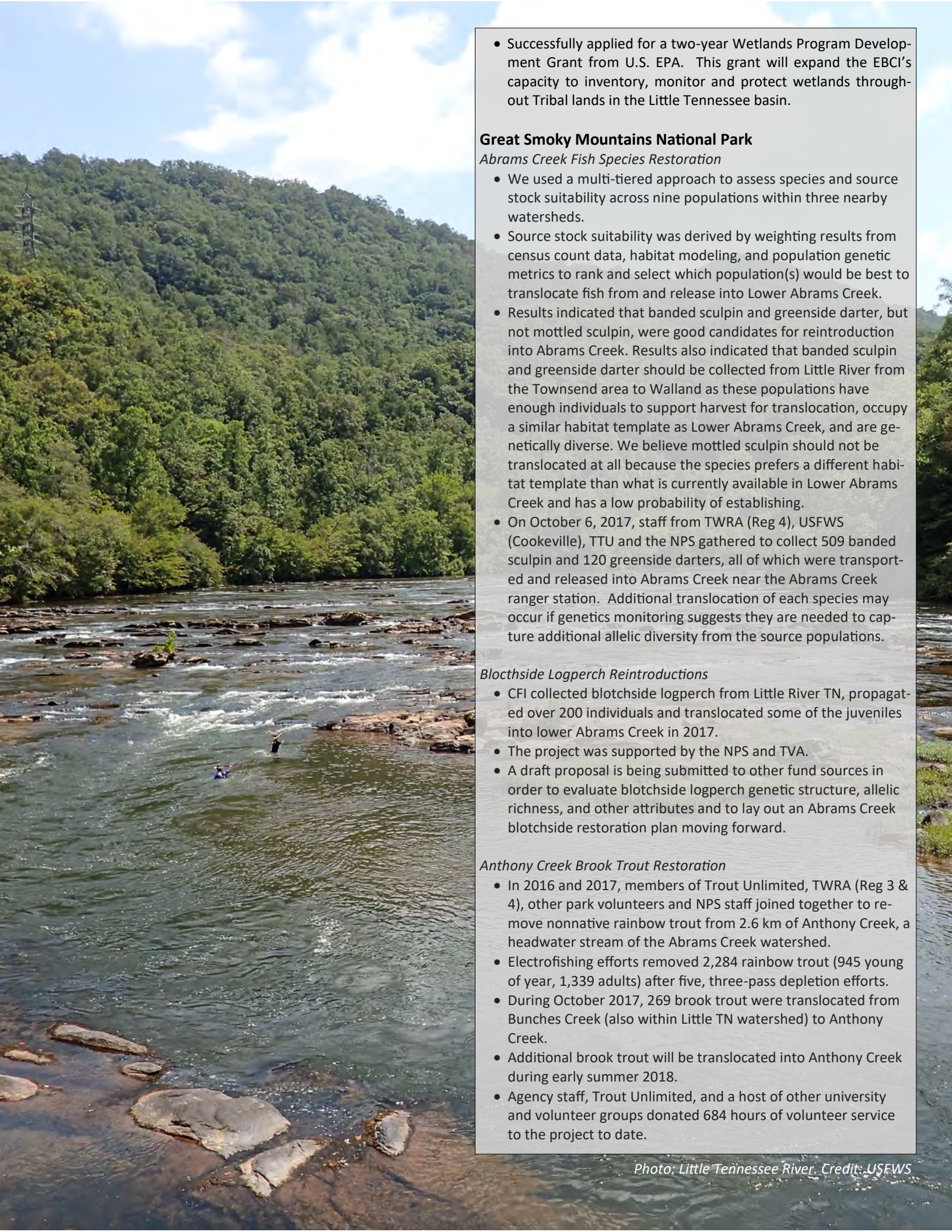
Conservation Fisheries, Inc. (CFI)

- Continued work with the federally listed smoky madtom, the yellowfin madtom, the Citico darter, and the spotfin chub in the lower Little Tennessee River system in Tennessee. Nests of the first three species were again collected from Citico Creek and captive-reared at CFI's hatchery in Knoxville for release to the Tellico River in 2017 and 2018.
- Qualitative and quantitative monitoring of the first three species noted above was conducted in Citico Creek, Abrams Creek, and the Tellico River as well as the source spotfin chub population in the Little Tennessee River in North Carolina and the introduced populations in Tellico and Cheoah Rivers. Fish were exchanged between Abrams Creek and Citico Creek following the National Park-approved translocation implementation and genetic monitoring plan, completed in 2015. Tellico River populations eventually will be included.
- No spotfin chubs were captively propagated or released in 2017.
- Sicklefin redhorse were again propagated, but with very poor success for various restorations in the Little Tennessee system. These were released to the Cheoah River.
- More recently undertaken projects resulted in production of ashy darters, blotchside logperch, and sickle darters (from Little River). Ashy and sickle darters were released to Tellico River, and blotchside logperch to Tellico, Citico, and Abrams.
- Most recently attempted (without success) was captive propagation of olive darters for restoration to Cheoah River.

Eastern Band of Cherokee Indians (EBCI)

- Completed final phase of EBCI's FY2017-18 USFWS Tribal Wildlife Grant (TWG) work plan which included IBI and wild trout population monitoring. The Oconaluftee River continued to demonstrate good diversity with 24 species detected in 2017 including the smoky dace and wounded darter (both Federal Species of Concern).
- Performed an assessment of redhorse populations in the upper Oconalfutee River using mark-recapture techniques in collaboration with Western Carolina University. Golden and black redhorse were relatively abundant, while no sicklefin redhorse were captured indicating that historic restoration attempts have yet to establish a robust population.
- Completed Clean Water Act Section 106 stream sampling and macro-invertebrate monitoring in the Soco Creek sub-wateshed with all samples showing "excellent" water quality and diversity indices.
- Began installation of three aquatic gauge stations (Hydromet) in the Oconaluftee and Snowbird watersheds. Data collected will improve monitoring of non-point and point source pollution, allowing for informed planning of future stream restoration projects.

Photo: Two girls snorkeling in the Little Tennessee River. Credit: USFWS



- Successfully applied for a two-year Wetlands Program Development Grant from U.S. EPA. This grant will expand the EBCI's capacity to inventory, monitor and protect wetlands throughout Tribal lands in the Little Tennessee basin.

Great Smoky Mountains National Park

Abrams Creek Fish Species Restoration

- We used a multi-tiered approach to assess species and source stock suitability across nine populations within three nearby watersheds.
- Source stock suitability was derived by weighting results from census count data, habitat modeling, and population genetic metrics to rank and select which population(s) would be best to translocate fish from and release into Lower Abrams Creek.
- Results indicated that banded sculpin and greenside darter, but not mottled sculpin, were good candidates for reintroduction into Abrams Creek. Results also indicated that banded sculpin and greenside darter should be collected from Little River from the Townsend area to Walland as these populations have enough individuals to support harvest for translocation, occupy a similar habitat template as Lower Abrams Creek, and are genetically diverse. We believe mottled sculpin should not be translocated at all because the species prefers a different habitat template than what is currently available in Lower Abrams Creek and has a low probability of establishing.
- On October 6, 2017, staff from TWRA (Reg 4), USFWS (Cookeville), TTU and the NPS gathered to collect 509 banded sculpin and 120 greenside darters, all of which were transported and released into Abrams Creek near the Abrams Creek ranger station. Additional translocation of each species may occur if genetics monitoring suggests they are needed to capture additional allelic diversity from the source populations.

Blocthside Logperch Reintroductions

- CFI collected blotchside logperch from Little River TN, propagated over 200 individuals and translocated some of the juveniles into lower Abrams Creek in 2017.
- The project was supported by the NPS and TVA.
- A draft proposal is being submitted to other fund sources in order to evaluate blotchside logperch genetic structure, allelic richness, and other attributes and to lay out an Abrams Creek blotchside restoration plan moving forward.

Anthony Creek Brook Trout Restoration

- In 2016 and 2017, members of Trout Unlimited, TWRA (Reg 3 & 4), other park volunteers and NPS staff joined together to remove nonnative rainbow trout from 2.6 km of Anthony Creek, a headwater stream of the Abrams Creek watershed.
- Electrofishing efforts removed 2,284 rainbow trout (945 young of year, 1,339 adults) after five, three-pass depletion efforts.
- During October 2017, 269 brook trout were translocated from Bunches Creek (also within Little TN watershed) to Anthony Creek.
- Additional brook trout will be translocated into Anthony Creek during early summer 2018.
- Agency staff, Trout Unlimited, and a host of other university and volunteer groups donated 684 hours of volunteer service to the project to date.

Photo: Little Tennessee River. Credit: USFWS

Karst Hydrology Study - Abrams Creek, Tuckaleechee and Little River Watersheds

- The USGS, TWRA and the NPS are currently engaged in a study examining the karst hydrologic processes ongoing in the Abrams Creek and Tuckaleechee Cove portions of the Abrams Creek watershed.
- Project objectives include characterizing the hydrology and groundwater-surface water interactions of the karst areas of Abrams Creek and adjacent karst areas, to understand the hydrologic behavior of the cave stream and groundwater features in the deep caves located to the north of Cades Cove, and to better define the hydrologic understanding needed to evaluate threats to the karst resources in these areas through collection and analysis of hydrogeologic data.
- Water quality samples will be analyzed for a variety of common anion/cations and other parameters to ensure the water quality is adequate to protect the caves and biota that lives within them.
- Dye and travel time results indicate significant connectivity between the Cades Cove karst features and karst features located outside of GRSM.
- Additionally, travel times (min/km) between these features has been extremely fast compared to other karst features across the country.
- Additional dye and travel work is continuing through 2018 in order to define additional sources and sinks in order to establish a water budget for the study area.

Mainspring Conservation Trust

- Working with the NCWRC an USFWS, removed barrier on Licklog Creek, along Needmore. Documented spotfin chub presence for the first time this fall.
- Purchased property along Cartoogechaye Creek to connect greenway to county rec park.
- Purchased lot adjacent to office. Brownfield cleanup scheduled for 2018.
- Purchased access to western entrance of Panthertown Valley.
- Purchased 778 acres in Graham County (King Meadows).
- Working with USFWS, two stream restoration projects along Savannah Creek in Jackson County (5,000+ feet restored) .

North Carolina Wildlife Federation

- Involved in the forest plan for the Pisgah and Nantahala National Forests, emphasizing a broad, ecological approach that includes old-growth and early successional habitats, with a strong emphasis on riparian management and water quality. Actively engaged in decisions affecting the management of western North Carolina's elk.

North Carolina Wildlife Resources Commission

- Sicklefin redhorse monitoring, translocation, and augmentation in the Tuckasegee River.
- Sicklefin redhorse monitoring and gamete collection in the Little Tennessee River.
- Cheoah River mussel reintroduction and augmentation (Appalachian elktoe, slippershell, wavy-rayed lampmussel, and rainbow).
- Cheoah River wounded and gilt darter reintroduction.

Photo: Stonefly exoskeleton. Credit: USFWS

- Spotfin chub monitoring on the Cheoah River started in 2016 to monitor reintroduction success.
- Long-term monitoring of priority fish, crayfish, and mussel species.
- Spotfin chub habitat assessment in the Little Tennessee River.
- With Mainspring Conservation Trust and the USFWS, retrofit of perched culvert on Licklog Creek, tributary to the Little Tennessee River. This culvert was the poster child of small aquatic organism barriers in the Little Tennessee River basin, and had blocked migration of spotfin chub and other small-bodies fishes from the mainstem into Licklog Creek.

Tennessee Wildlife Resources Agency (TWRA)

- TWRA conducted an outreach "science day" event at Carpenters Elementary School in Blount County. A stream ecology presentation (Centenary Creek) was made to K-5 students..
- TWRA cooperated with the National Park Service, US Fish and Wildlife Service and Tennessee Tech University in relocating banded sculpin and greenside darter to Abrams Creek as part of the native fish/mussel host reintroduction project being conducted by the National Park Service. Approx. 530 sculpins and 120 darters were translocated from Little River to Abrams Creek.
- TWRA organized a "shade your stream" meeting between the NRCS, TVA and Blount County Soil Conservation District to identify possible project in Blount and Monroe counties, in an effort funded by the Tennessee Valley Authority. Jason Meader attended and shared his experiences in NC with the group.
- We conducted brook trout surveys in Upper Bald River and Sycamore Creek. We continued our rainbow removal in Sycamore Creek. We documented brook trout declines in both streams.
- We also assisted the USFS with Tennessee dace surveys. This effort was part of a barrier assessment.

U.S. Fish and Wildlife Service (USFWS)

- Joined CFI, the NCWRC, and others in sicklefin redhorse conservation efforts.
- Worked with Mainspring Conservation Trust on two stream restoration projects on Savannah Creek and a barrier removal on Licklog Creek, after which spotfin chub was found in the creek for the first time.

University of Tennessee-Knoxville

- During July, with funding from Brookfield Energy, partners from University of Tennessee-Knoxville and Great Smoky Mountains National Park snorkel-surveyed lower Abrams Creek during the dewatering of Chilhowie Reservoir in Tennessee. Found rainbow, wavy-rayed lampmussel, and a species petitioned for listing under ESA, the Cumberland moccasinshell. Interestingly, this rare species was found only in habitats occupied by reintroduced and federally endangered yellowfin madtom and Smoky madtom that might serve as mussel glochidia hosts.
- Surveys occurred in the main stem Little Tennessee River during the drawdown between Calderwood and Chilhowie dams. Only relic shells of *Utterbackia imbecilis* was found, which thrives in impoundments. Other tributaries were surveyed that were previously impounded, and no other native species were found.
- During October, partners surveyed the cut-off reach below Calderwood dam (unimpounded), and we found fresh-dead shells of an introduced Atlantic-slope species (fluted kidneyshell), as well as live wavy-rayed lampmussel, and fresh-dead shells of the federally petitioned mountain creekshell showing that rare native mussel species can persist in the Little T if given an appropriate flow regime.

Photo: Setting up a fish trap on the Tuckasegee River. Credit: USFWS

Things you can do to support clean water and healthy streams

Clean your fishing and recreational equipment between trips to avoid carrying unwanted invasive hitchhikers between rivers. • Never leave live bait in or near a river unless you collected it there. • Follow application and disposal instructions when working with home, lawn, and automotive chemicals. • Plant native trees, shrubs, and other woody plants along streams. • Whenever you disturb soil, ensure proper measures are in place to keep dirt from eroding into streams. If you're a farmer, contact your local Soil and Water Conservation District; a logger, contact your state forestry agency; a developer, contact the county sediment and erosion control office or the state water quality office. • Look for ways to capture stormwater runoff on your property and ensure it's soaking into the ground.

Little Tennessee Native Fish Conservation Partnership Executive Committee

Chair – Andrea Leslie, N.C. Wildlife Resources Commission, andrea.leslie@ncwildlife.org

Vice-Chair – Erin McCombs, American Rivers, emccombs@americanrivers.org

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Assessment and Implementation Team chairs – Andrew Henderson, U.S. Fish and Wildlife Service, andrew_henderson@fws.gov; Shannon O'Quinn, Tennessee Valley Authority, tsoquinn@tva.gov

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Outreach Team chair – Jason Meador, Mainspring Conservation Trust, jmeador@mainspringconserves.org

Immediate past chair—Damon Hearne, Clean Water Management Trust Fund, damon.hearne@ncdcr.gov

Partners

American Rivers • Conservation Fisheries Inc. • Duke Energy, Carolinas • Eastern Band of Cherokee Indians • Georgia Department of Natural Resources • National Park Service • Mainspring Conservation Trust • North Carolina Wildlife Federation • North Carolina Wildlife Resources Commission • Sierra Club, Tennessee Chapter • Tennessee Department of Environmental Conservation • Tennessee Valley Authority • Tennessee Wildlife Resources Agency • University of Tennessee • U.S. Fish and Wildlife Service • U.S. Forest Service • Watershed Association of the Tuckasegee River

Photo: Sculpin caught in Cartoogechaye Creek. Credit: USFWS