For eastern North Americans, the presence of native brook trout in their local waters symbolizes the highest watershed condition and best coldwater habitat. Brook trout fisheries have become the popular standard of what a mountain stream should be and reflect the health of many other species dependent on these unique ecosystems. Using the brook trout as our foundation for coldwater outreach and education, Trout Unlimited (TU) will engage its members and the conservation community at large by using the latest brook trout science to target and demonstrate innovative and proven restoration technologies for aquatic organism passage, obliterating abandoned roads to improve forest hydrology and habitat connectivity, increasing riparian forest connectivity and its shade-producing canopy, and recreating lost instream habitat through engineered large wood materials restoration. Brook trout health and their habitat range serve as a surrogate for the health and range of other associated riparian and coldwater species.

The health of the charismatic eastern brook trout centers on the remnant coldwater habitat from the times when the coldwater range was farther reaching and less fragmented. Human land uses, including timber harvesting at the turn of the 20th century, poor agricultural practices’ impacts on riparian zones and stream habitat, and the so called ‘rehabilitation’ of post-flood stream channels that removed structure and cover, have all created artificially warm conditions in formerly coldwater habitat. Poorly designed road crossings have fragmented habitat, and although many dams have become obsolete, without intervention they will continue to inhibit movement by fish and other organisms—further isolating populations. The places where native eastern brook trout are found—in the ‘patches’ between these warm and fragmented waters—represent ecologically and culturally significant areas.

TU is using the evolving science of brook trout to guide restoration and reconnection efforts on both private and public lands. Increasing ecosystem resilience and coldwater persistence will rely on innovative and cost-effective habitat work. To this end, TU’s partnership will demonstrate and measure the effects of the following four significant types of approaches:

- **Large Wood Materials**: TU and the U.S. Forest Service have partnered to demonstrate the financial and ecological benefits of engineered large wood structures in impaired stream systems. This economically viable application adds to limited over-winter hibernacula for fishes, reptiles and amphibians; critical summer pools for thermal refugia; sediment cleaning and sorting to aid in the reproduction of fishes, benthic insects and America’s largest salamander, the Eastern Hellbender (*Cryptobranchus alleganiensis*); and rearing habitat for both fishes and riparian species.

- **Strategic Riparian Plantings**: Recent mapping work completed by the Eastern Brook Trout Joint Venture, the U.S. Geologic Survey, and the U.S. Forest Service identified strategic coldwater areas to plant riparian forests to minimize solar gain. TU will install appropriate plant species within these strategic areas, based on input from local botanists and biologists to maximize the benefit to resident and migratory riparian species, including bats and Northern flying squirrels.

- **Stream Simulation Techniques at Road Crossings:** TU is working with the U.S. Forest Service and the Natural Resource Conservation Service (NRCS) to demonstrate stream crossings that mimic the natural site conditions of the channel. This technique reconnects isolated habitat and populations of fishes and restores the flow of genetic material. It also allows for the migration of species to cooler, higher elevations, and their return to downstream habitat. While this technique is used in other parts of the country, TU will sponsor a workshop to share its benefits and technical application to resource professionals throughout the mid-Atlantic region.

- **Abandoned Road Obliteration:** Many eastern forests have dense road networks that fragment terrestrial habitat, increase the speed of surface runoff, and reduce the amount of base water flow during periods of low precipitation. Obliterating obsolete roads increases water infiltration and augments critical coldwater low flow, in addition to connecting forest tracts for upland mammals, birds, reptiles and amphibians.

As we move forward with these approaches, TU will share the lessons learned. Our demonstration projects will enable landowners and other practitioners to observe and learn—and allow for the transfer of knowledge to other people and places.