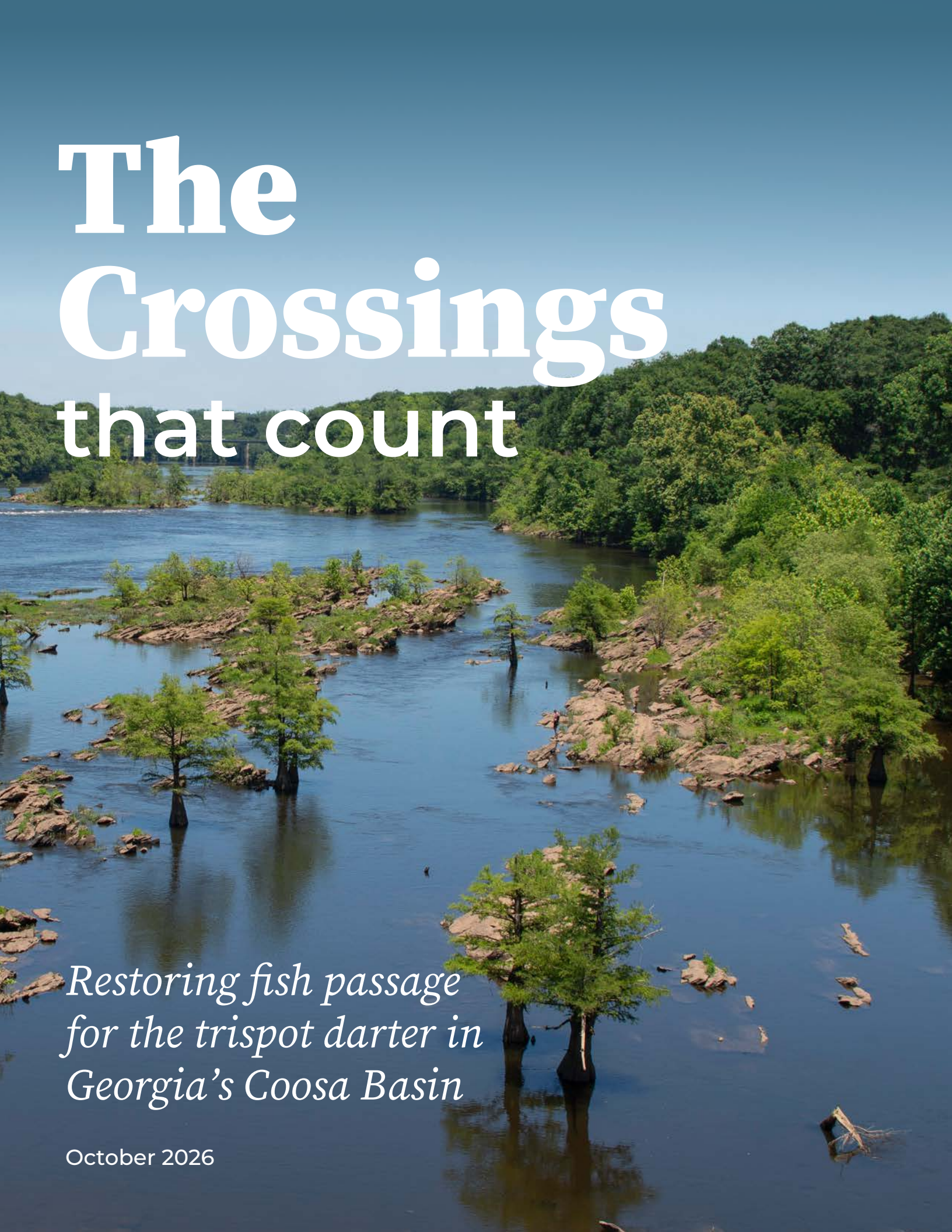




The Crossings that count

*Restoring fish passage
for the trispot darter in
Georgia's Coosa Basin*

October 2026



The small fish that needs a clear path: the trispot darter (*Etheostoma trisella*).



Stephen Bontekoe, Limestone Valley RC&D, leads a group discussion on approaches to building landowner relationships with representatives from the GA DNR, NFWF, USFWS, and other project partners.



A newly completed concrete culvert, shown shortly after construction and ahead of revegetation.

Cover Image: Coosa River Basin, Georgia.

A Small Fish with a Big Problem

Every winter, the trispot darter (*Etheostoma trisella*) makes a journey. The federally threatened species spends most of the year in the mainstem rivers of Georgia's Coosa Basin, but each winter it pushes upstream to spawn in tiny, groundwater-fed seeps, shallow water barely moving through leaf litter and mud. For many of this species, that journey now ends at a road crossing that they cannot pass.

The Conasauga and Coosawattee River watersheds in northwest Georgia hold some of the most important remaining habitat for the species, and some of the most fragmented. Crisscrossing throughout these watersheds are more than a thousand road-stream crossings, many of which are undersized, structurally degraded, or perched too high above the streambed for small fish to pass. Prior to 2020, only four trispot darter spawning locations had been confirmed across the species' entire range.

The Georgia Department of Natural Resources (GA DNR), working with The Nature Conservancy (TNC), Limestone Valley Resource Conservation and Development Council (Limestone Valley RC&D), and a broad network of federal, academic, and community partners, is leading an effort to change that math, one crossing at a time, across an entire basin. The project has targeted six priority culverts for replacement, with four completed to date.

Built to Move Water, Not Fish



Road crossings in the Conasauga and Coosawattee watersheds were designed to carry stormwater beneath roadways, sized for flood capacity rather than for the passage of small fish. Over time, that design mismatch has produced barriers through several distinct mechanisms. Sediment and debris accumulation has narrowed some culvert openings, increasing water velocity beyond what a small-bodied fish can swim against. Streambed erosion downstream of other structures has lowered the channel elevation, leaving the crossing perched above the current streambed and creating a vertical drop fish cannot ascend. In some cases, structural failure of the crossing itself has compounded these effects. The mechanism differs by site, but the outcome is consistent: a barrier that the trispot darter cannot pass.

Above: A replacement culvert at a fish passage barrier with planting and reseeded underway.

Right: Site visit attendees observe an aluminum crossing and discuss design considerations. Choosing a structure material involves balancing cost, effectiveness, geographic constraints, and sometimes regulatory requirements.

Replacing these structures is costly, and the price often exceeds what many communities in the area can afford. Whitfield and Murray Counties, where the majority of identified barriers are concentrated, are classified as economically distressed by the Appalachian Regional Commission, with poverty rates substantially above the regional average. Without external investment, structurally inadequate crossings tend to remain in place for decades, leaving upstream spawning habitat inaccessible even though it is otherwise intact.





One Structure, Many Benefits

Replacement designs address the same hydraulic conditions that created the original barrier, in reverse. Where an undersized or perched structure constricts flow and elevates velocity, a properly sized replacement is built to the width and depth of the natural channel, allowing water and fish to move through at velocities consistent with the surrounding stream. Where feasible, partners use open-bottom structures that leave the stream's natural bed in place rather than replacing it with a poured floor. A fish then swims over the same kind of streambed it would encounter anywhere else in the channel, with no ledge or transition to navigate.

That same capacity provides flood resilience. A structure sized only to the flow conditions present at construction is vulnerable to overtopping and failure during higher flow events, the same type of failure responsible for the washouts documented at crossings throughout this basin. Replacement designs instead follow the Georgia Stream Crossing Handbook, which specifies sizing to accommodate a broader range of flow conditions, so a single structure addresses both fish passage and structural durability.

Grouping nearby crossings adds a third benefit. When replacements fall within the same area or planning window, partners can move design, permitting, and construction

forward as a single coordinated effort rather than several separate ones, sharing costs, equipment, and experience along the way.

Beyond the efficiency of grouping crossings, a single culvert replacement often serves several goals at once. A county may be focused on public safety at a degraded crossing, an environmental partner on removing a barrier to aquatic organism passage, and the state on managing sediment transport through the watershed. Where those priorities converge on the same structure, one replacement satisfies all three, and the county gets a safer, more durable crossing without bearing the full cost alone. It's a pattern that repeats throughout the project: progress here rarely comes from one organization pursuing one goal, but from several finding a shared one.

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Scarcity mindset is the opposite of progress. We are working together out here, building causes and friendships.

Stephen Bontekoe,
Executive Director, Limestone Valley
Resource Conservation and
Development Council

Above: Representatives from ECT, USFWS, GA DNR, TNC and Limestone Valley RC&D, talk through crossing design concepts and paving schedule for the culvert infrastructure at a site visit.

Finding the Crossings That Count

The GA DNR, TNC, and Limestone Valley RC&D anchor a wider network of partners carrying out this work on the ground, and their approach starts with figuring out which of the 1,000+ crossings in the basin matter most. With funding to replace only a handful, the central challenge is deciding where to build. Partner crews assess crossings using a standardized protocol developed by the Southeast Aquatic Resources Partnership (SARP), measuring on-site conditions that determine whether a structure allows aquatic organisms to pass or blocks them.

Every result is logged into a shared, region-wide database maintained by SARP and the U.S. Fish and Wildlife Service, so the data gathered here continues to inform fish passage planning across the Southeast long after this project ends. The proposal set a target of 300 to 400 crossing assessments, which will be completed by local university students hired and trained by the project. Furthering the goal of increased local ownership of trispot darter conservation. Partner crews have completed more than 1,600 assessments, building a far stronger picture of where to act next than anyone anticipated at the outset.

A high assessment score alone doesn't decide where the project builds next. Partners weigh that score alongside the physical condition of the crossing, how much upstream habitat its replacement would reconnect, the quality of that habitat, and whether the trispot darter has actually been documented using it. Environmental DNA (eDNA) is a sampling technique that detects a species' genetic material directly in a water sample, which lets partners confirm where trispot darter are spawning even in small channels where traditional fish surveys are difficult to conduct. Partners are actively sampling more than 30 tributary sites for eDNA through the winter spawning season, and as results are finalized, they are expected to sharpen prioritization further, pointing more precisely to which barriers stand between the species and the spawning habitat it is still trying to reach.

Four high-priority crossings identified through this process have been replaced to date, with more advancing through design and permitting.



Stephen Bontekoe (Limestone Valley RC&D) and Will Singleton (NFWF Program Director, Southern Regional Office) stand on bare ground at the construction site following recent stream improvements.

KEY PROJECT OBJECTIVES

- Road-crossing assessments at 1,600+ sites using the SARP standardized protocol
- eDNA sampling at 30+ tributary sites during the winter spawning season
- Culvert removal and replacement at priority fish passage barriers
- Student workforce development through partnerships with regional universities and colleges

Building Trust, One Conversation at a Time



None of this works without landowners willing to grant access, and in this part of Georgia, that access is earned in person.

Limestone Valley RC&D and TNC have built the project's reach through door-to-door conversation rather than written notices or formal meetings, the same hands-on approach that shapes the rest of the work.

The question landowners raise most consistently is what it could mean for their property if the species is found there. Liability protections do exist for certain voluntary conservation activities, but whether and how they apply depends on the specifics of each property and each project. Partners walk landowners through that evaluation directly, and that willingness to sit down and work through the specifics, rather than hand over a pamphlet, is what has let the project move forward on private land at all.

Landowners who have already taken part now vouch for the project to their neighbors, and several who started out with questions have gone on to open up additional sites on their own property. Partners view that kind of word-of-mouth as a strong sign the project has earned the community's trust.

That same relationship-building, whether through landowner access work or through outreach and education, has carried the project into the wider community. Elementary school programming, including coloring books and classroom materials centered on the trispot darter and local streams, has introduced the species to a new generation. Trispot darter festivals and local film screenings have done the same for adults, reframing the project from an outside intervention into a shared community story, one centered on what healthy streams mean for the people living alongside them.

Above: Limestone Valley, GA DNR, The Nature Conservancy, NFWF and NFWF Field Liaison, and US Fish and Wildlife Service by a watershed.



Project Status & Next Steps

Four culverts have been replaced to date, with planting and reseeding underway or planned at each site. The assessment effort that guides the replacement work has already outpaced its own goal more than fourfold, evaluating over 1,600 crossings against an original target of 300 to 400. The eDNA sampling, collected across multiple spawning seasons, is still being analyzed, but partners expect it to sharpen prioritization further once it's folded into the planning framework already in use.

Next, the partners will finish the remaining replacements, complete revegetation at finished sites, and feed eDNA results into the prioritization model as they become available. Landowner coordination will continue as part of an ongoing effort to educate and engage with the local community.

Even where a crossing hasn't been replaced yet, the work behind it isn't wasted. Each assessed crossing is documented in the shared database as a priority, ready to be addressed as future funding becomes available, and the equipment used to conduct these assessments isn't tied to this project alone. TNC maintains two equipment sets, based out of its Rome and Dahlonega offices, available to any organization conducting stream assessments in the Coosa watershed and beyond. The data and tools built here are meant to outlast this round of funding.

With these partner organizations working together, more and more fish are expected to reach their spawning grounds. One crossing at a time.



Long-Term Benefits

Restored connectivity between trispot darter spawning and non-spawning habitat.

Reduced risk of flooding and washout at replaced road crossings.

Strengthened prioritized inventory of barriers to guide future investment.

Expanded knowledge of trispot darter spawning habitat through eDNA.

Trained local workforce in standardized aquatic assessment protocols.

This success story was developed by Environmental Consulting & Technology, Inc. (ECT) to share information about the National Fish & Wildlife Foundation's (NFWF) America's Ecosystem Restoration Initiative (AERI) Program.

For more information on this project or the AERI Program, contact [ECT's Field Liaison Team](#) or visit [ECT's NFWF National Programs page](#).