

# MOUNTAINS

## Road ecology comes to Southern Appalachia



**Word from the Smokies**  
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Columnist



**Aerial view of the Pigeon River Gorge, a dangerous 28-mile section of Interstate 40 between Asheville and Knoxville where more than 27,000 vehicles travel daily near Great Smoky Mountains National Park.** PROVIDED BY JAKE FABER/SOUTHWINGS

On July 1, the United States House of Representatives passed the INVEST in America Act to reauthorize funding for transportation projects across the county. Aiming to protect biodiversity, stimulate the economy, and reduce highway fatalities, the bill proposes \$400 million for projects to reduce wildlife-vehicle collisions.

One local group that may benefit is Safe Passage: The I-40 Pigeon River Gorge Wildlife Crossing Project, which is working with North Carolina and Tennessee Departments of Transportation on plans to reduce wildlife-vehicle collisions on Interstate 40 between Asheville and Knoxville.

Comprised of nearly 20 federal, state, tribal, and non-governmental organizations, Safe Passage hopes to make a dangerous 28-mile stretch of roadway safer for both wildlife and humans. Soon researchers will present science-driven recommendations that DOTs can consider as they improve several bridges near the boundary of Great Smoky Mountains National Park.

American black bear, white-tailed deer, and reintroduced elk create the greatest safety hazards for motorists in the winding Pigeon River Gorge. But researchers here are simultaneously assessing the behavior of smaller mammals and even aquatic species, asking questions like, “Where are animals successfully crossing the roadway?” and “At what hotspots are the most animals dying?”

Land bridges in Texas and Utah recently gained national attention, allowing species large and small to enjoy safe passage over busy highways. With more than 27,000 vehicles traveling daily through the Pigeon River Gorge — 20 miles in North Carolina and eight miles in Tennessee — potential solutions to wildlife mortality here could take many forms. Culverts, bridge extensions, and overpasses, used in combination with fencing to guide wildlife, can all help animals cross safely and greatly reduce wildlife-vehicle collisions.

The Safe Passage project is an example of road ecology, the study of how life is altered for both plants and animals when roads are nearby. Besides the risk of dying in attempts to cross, animals

are disturbed by noise, light, and air pollution from having roads near their homes. But highways can create more insidious issues that are detrimental to entire species.

“Collisions may be road ecology’s most obvious concern, but fragmentation is roadkill’s pernicious twin,” writes Ben Goldfarb in “How Roadkill Became an Environmental Disaster,” published in *The Atlantic* on November 26, 2019. Roads are one of the largest causes of habitat fragmentation because they carve up large landscapes where for millennia wildlife corridors were left undisturbed.

Goldfarb points out that roadkill-obsessed biologists have been counting carcasses since automobiles were invented. But it wasn’t until the late 1990s that the term “road ecology” was coined and researchers began to study effects like the increased heart and respiratory rates of individual animals assessing their stressful crossing options.

Safe Passage builds on collaborative efforts that coalesced 35 years ago to prevent clear cutting and preserve roadless areas across Southern Appalachia. Hugh Irwin and Taylor Barnhill — now both stakeholders in the Safe Passage project — were involved in these first road ecology initiatives in Western North Carolina and East Tennessee.

“In the mid-1980s, we had just healed from the construction of I-40 through the gorge, and realized the mountains were about to be fragmented by interstate highways,” said Barnhill, an architect and historian now working with the Appalachian Barn Alliance in Madison County, North Carolina. “Next, the United States Forest Service announced a



**These bobcats in the Pigeon River Gorge are using a culvert intended for moving water in order to make a safe crossing under the highway. This camera-trap image illustrates that adults will teach their young to use available structures if they are safe.** PROVIDED BY NATIONAL PARKS CONSERVATION ASSOCIATION AND WILDLANDS NETWORK

comprehensive management plan that would mean clear cutting nearly 50 percent of the National Forest over the next 50 years.”

Groups of people across the region mobilized in opposition to clear cuts, massive road building, and other destructive practices. Their hopes were to secure protection for roadless areas and ultimately turn the tides in the direction of forest plans that would value and prioritize biodiversity and conservation over logging.

“I remember hiking the AT and the

trail followed a clear-cut area for about a half mile near Hot Springs,” Barnhill recalled. “I was astounded at what that looked like. A lot of us conservationists quit our jobs, worked out of our pickup trucks, and created grassroots nonprofits in an attempt to stop big timber and the destruction of our public lands.”

By the mid-1990s, a loose network of national, regional, and grassroots organizations had begun cooperating, sharing information, and seizing every opportunity to influence Forest Service management plans. This informal network eventually became the Southern Appalachian Forest Coalition, and its seminal document, released in 2002, was “Return the Great Forest: A Conservation Vision for the Southern Appalachian Region.”

“SAFC’s vision for the Southern Appalachians identified core areas and key corridors that made up a conservation network — a network that could be even better if these core areas were protected and corridors were made more robust,” said Irwin, now a landscape conservation planner with The Wilderness Society. “It was clear from the analysis we did that making the corridors more robust involved addressing highway and road issues.”

One of the key corridors identified in SAFC’s conservation network vision was the Pigeon River Gorge, and it had to be protected for the larger network to function over the long haul. However, Irwin said that in the 1990s and early 2000s, departments of transportation were not receptive to acknowledging that highways impacted the movement of wildlife and were not ready to embrace engineering designs to address these impacts.

“It is only in the last few years that changing attitudes have allowed room for acceptance of designs and expense to facilitate wildlife movement,” he said. “This highlights the importance of the long view — it takes time for the right climate to exist for grand and ambitious plans like Safe Passage to find the right environment to thrive.”

*Frances Figart is the editor of Smokies Life magazine and the Creative Services Director for the 28,000-member Great Smoky Mountains Association, an educational nonprofit partner of Great Smoky Mountains National Park. Find her new book “A Search for Safe Passage” at SmokiesInformation.org, learn more about the collaborative project at SmokiesSafePassage.org, and reach the author at frances@gsmasoc.org.*



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