

Conservancy Begins Multi-State Effort to Address Dead Zone



America's biggest river, the Mississippi, needs the help of America's biggest conservation organization. Photo © Harold E. Malde

Nobody ever accused us of being timid. The Nature Conservancy is undertaking a bold strategy to help fix the “dead zone” in the Gulf of Mexico. During the next decade, the Conservancy aims to reduce the influx of nitrogen and phosphorus—also known as nutrients—into the Mississippi River by 20 percent. In doing so, we aim to shrink the size of the Gulf’s dead zone from its current average of 5,220 square miles (bigger than the state of Connecticut) to 2,000.

Why should you care? The Gulf of Mexico is one of America’s most important fisheries. Man-made inputs of nitrogen and phosphorus—from agriculture, urban runoff, inadequate sewage treatment—have led to massive growth of algae that, as it dies, chokes off oxy-

gen in the water that fish, shrimp and other marine creatures need to survive. The National Oceanic & Atmospheric Administration has estimated that the dead zone costs the U.S. seafood and tourism industries \$82 million a year as it degrades water quality and habitat in this iconic seascape

How can The Nature Conservancy make this happen? It’s going to take a push from across the Conservancy. Thirty-one states are part of the Mississippi River basin, and the river flows across 10 states before emptying into the Gulf of Mexico. Our organization has analyzed the Mississippi River basin and determined which areas are the biggest contributors of nutrients. They are the “Corn Belt” states: Indiana, Illinois, Iowa and Ohio. In those

states, over the next 18 months, the Conservancy is mobilizing to put proven conservation measures in place that will reduce those nutrients, particularly from agriculture and urban sources. In addition, the Conservancy will target Louisiana’s Atchafalaya River basin to divert flows from the Mississippi River into floodplains where natural processes will remove the nutrients. Next steps will involve setting conservation targets in other states and tributaries to cut the flow of nutrients into the Mississippi and the Gulf.

“This project represents the growth of The Nature Conservancy from a land trust to a true conservation organization,” says Tennessee’s former state director Scott Davis,

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Sparking a Movement: Where Certified Firewood Comes From



A bundle of heat-treated, certified firewood. Photo © Cheryl Ruehling

In 2015, the Great Smoky Mountains National Park became the first park in Tennessee to restrict firewood to either downed wood within the park or heat-treated, certified firewood. Why? Foreign insect pests can hitchhike hundreds of miles on firewood and can devastate our forests. The Nature Conservancy played a key role in the park's strategies for keeping out forest pests—including the new firewood rule—and we're proud of that role.

Those who aren't aware of the threat to forests from pests may think that the new firewood rules represent unnecessary red tape. But as it turns out, those new firewood rules not only help protect forests. They have also led to a surge in businesses retailing and wholesaling certified, heat-treated firewood. Just a few years ago, no one was selling heat-treated firewood in Tennessee. Now a dozen wholesalers are producing heat-treated, certified firewood in Tennessee, Kentucky and

North Carolina, and nearly 100 retailers are selling the certified firewood in Tennessee now, with most locations near the park. To get an idea of what goes into certified firewood, we talked with Cheryl Ruehling, co-owner of R&R Firewood with her husband, Kevin. We found out that Cheryl and Kevin are new to producing certified firewood. "We got our certificate in January 2015," she says.

The Ruehlings, who are based in Grundy County, got into the business after a camping trip at Cades Cove in the Smokies in 2014. "We talked to officials at the park, and they told us that 2015 would be the first year with the new regulations for heat-treated firewood. We decided to go for it.

"Kevin built the kiln himself, and then the state of Tennessee and Denise Haffner from the USDA came out, inspected our kiln and gave us our certification. We were some of the first

to start supplying the park with certified firewood, and we think that helped us get into the market."

The kiln-based method that kills pest insects lurking in the wood is a strictly controlled process. "The internal temperature of the wood has to reach 140 degrees for over an hour," says Cheryl. "We know when the wood has reached this temperature because we drill holes in the wood and insert probes into it which are connected to electronic dataloggers that monitor the temperature and heating time."

During the prime camping season of May through October, the Ruehlings produced between 800 and 1,000 bundles of certified firewood a week for four retail locations in and around Great Smoky Mountains National Park. The Ruehlings do all the work themselves—from acquiring the timber, to heat-treating it in the kiln, to bundling the wood in a handy package and then delivering the firewood to retail locations. It's hard work but it's satisfying, says Cheryl. "We love it, we really do," says Cheryl. "Speaking for myself, I enjoy every aspect of it. We hope the business will grow but not so much to where we couldn't do it ourselves. I like making sure it's all done right."

You can use our handy Nature Conservancy web map to find locations where you can buy certified firewood. Go to nature.org/firewoodmap. We're also sharing this information on firewoodscout.org, a website which also includes certified firewood information for other states.

Pushing Forward With Crucial WNS Research

The bat epidemic known as White Nose Syndrome has been relentless in killing cave bats. So we have to be unceasing in our work to find a cure.

In 2015, we announced a potential breakthrough treatment for bats afflicted with White Nose Syndrome (WNS). Researchers funded by the Tennessee Chapter of The Nature Conservancy and Bat Conservation International (BCI) had found that commonly occurring bacteria, *Rhodococcus rhodochrous*, can inhibit the growth of the fungus that causes WNS. In fact, bats exposed to gases from the bacteria in experimental treatments during the winter of 2014-2015 fully recovered.

This past winter, researchers Dr. Chris Cornelison and Dr. Sybill Amelon hoped to conduct further research on this treatment at the Conservancy's artificial cave in Montgomery County. Unfortunately, they were unable to collect enough bats to conduct their experiments because of the devastating impacts of WNS. For this season, that part of their research is on hold.

However, as BCI's Imperiled Species Director Katie Gillies says, "There isn't likely to be a single silver bullet as WNS is affecting several bat species across a broad geographic area. Developing a suite of tools is likely to be more effective than putting all our eggs in one basket."

For that reason, the Tennessee Chapter and BCI are funding additional research projects this year aimed at controlling WNS. Here are the three lat-



Cory Holliday (foreground) and survey team inspect a Tennessee cave filled with bats.

est projects to be funded:

- Dr. Auston M. Kilpatrick of the University of California at Santa Cruz is researching treatment of bats using a native bacterium (a different one from Amelon and Cornelison's) that is already present on bats but in low numbers. This bacterium appears to inhibit the growth of the WNS fungus. Kilpatrick is researching ways to increase the amount of bacteria and apply to the bats as a probiotic.
- Dr. Joan Bennett of Rutgers University is testing the use of a fungally derived compound to treat bats. This compound would be sprayed to fumigate caves and fight the *Pseudogymnoascus destructans* fungus that causes WNS.
- The third project is another aspect

of Dr. Cornelison's research on using bacteria to treat bats. He's researching ways to optimize production of the bacteria to allow it to be used at a large scale in bat treatments. This part of his research is moving forward because it does not require infected bats.

Meanwhile, we are also working with the Tennessee Wildlife Resources Agency on a three-year contract to study the effects of WNS on bat populations across Tennessee. "Most of the information on bat populations and how WNS affects them comes from the Northeast. But we have a different suite of bat species here, warmer climates and other variables," says our Cave Program Director Cory Holliday. "This is important information for us to gather as we grapple with this terrible bat epidemic."

Advocacy Day on Capitol Hill



In October, Tennessee Chapter state director Gina Hancock and Tennessee Chapter trustee Jay Gullede met with Senator Bob Corker at his Washington office, along with Glenn Prickett, the Conservancy's national Chief External Affairs Officer. Advocacy Day is an annual event in which Conservancy staff and state trustees meet with Congressional leaders on Capitol Hill in Washington about important conservation issues. Pictured from left: Senator Corker, Gina Hancock, Glenn Prickett and Jay Gullede.



Payback Coming in May

What is The Big Payback? It's a 24-hour, online giving event for nonprofits on May 3, hosted by the Community Foundation of Middle Tennessee. The Tennessee Chapter will be participating. So follow us on Facebook and Twitter, save the date on your calendar, tell your friends and help us do more great conservation in Tennessee with a big day for The Big Payback. Visit thebigpayback.org for details.

WATER: The Mississippi River cont.

now Director of Conservation Programs for the Conservancy's Central Division in the U.S. "The Conservancy will continue to buy and protect land. That won't stop. This isn't an either/or proposition. But conservation science tells us that for the sake of nature's health and our health we have to address these system-wide threats."

In addition to tackling a major environmental issue, this project is aimed at improving how our state chapters, staff and donors coordinate together effectively on multi-state projects. "Threats to nature don't stop at state boundaries, and that's why we can't," says Davis. "This is the most important project I have been involved with in my 22 years with The Nature Conservancy."

Where does Tennessee fit into this project? Tennessee contributes to the nutrient loading in the Mississippi River too, mostly from agricultural runoff but also from major cities like Memphis and Nashville. Our state's rivers rank fifth in phosphorus contributions in the Mississippi basin. In the short term, our West Tennessee Program Director, Jeff Fore, will serve as part of the Mississippi River nutrient project's science team. Going forward, our Tennessee conservation team (including Jeff) will determine which strategies we can employ to reduce our state's contribution to the problem.

"In many ways, we're already working on the problem in Tennessee," says Fore. "Much of our stream and river

work in West Tennessee is aimed at reducing erosion and sedimentation, which in turn reduces phosphorus loading and improves stream habitats. That includes installing grade-control structures, stream and floodplain restoration, and working with farmers to grow 'cover crops' [unharvested plantings during the offseason to improve soil health, reduce erosion and reduce nutrient inputs into streams].

"The Conservancy is well positioned to address this problem," adds Fore, "because we have the expertise and the staff capacity to deal with freshwater problems on a system-wide scale." As this Mississippi River basin project develops, we will keep you updated on its progress.