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One Man's Slash is Another Man's Treasure

By [Gwyn Ingram](#) on Jul 7, 2008



Understory grasses and herbs thrive in thinned Francis Marion stand.

Forest biomass becomes an energy source.

Hurricane Hugo leveled more than 30,000 acres of the Francis Marion National Forest in 1989. Now, nearly 20 years later, an unanticipated benefit of the storm has emerged for the forest, for the state of South Carolina and potentially for the entire country.

Francis Marion and Sumter (FMS) Timber Sales Forester Jon Dent's practical solution to a daunting surge of vegetative regeneration after Hugo may ultimately help fuel a national movement toward the conversion of forest brush, slash and debris into natural energy sources.

Dog Hair Thicket

In the aftermath of the hurricane, the responsibility fell to Dent to develop a solution to a growing problem -literally a 'growing' problem. Hugo's sustained 130 mile per hour winds flattened about a third of the forest with damage lessening proportionally as the distance from the eye increased. In the hardest hit areas, only some cypress trees and a few hardwoods remained standing.

"For the first 10 years or so after the storm, we had nothing to do but sit and watch things grow," Dent explained. "It was all growing back at once, lots of pine but also lots of hardwood and heavy brush like wax myrtle."

The potential for catastrophic fire soared with such dense growth, exacerbated by the fact that pine needles cast by the young trees hung suspended in the underbrush, providing light fuels to carry fire rapidly from the ground to the canopy.

"Before Hugo, when young stands of pine in that area got up to a merchantable pulpwood size of five to ten inches in diameter, we'd come in for our regular first thinning," Dent said. "Typically we were able to thin about 7,800 acres of timber annually. Imagine 30,000-40,000 acres of that all coming up at once; it's a daunting predicament."

Also facing a new Hugo-related threat were the endangered Red-Cockaded Woodpecker populations in the area, a species that makes its home in cavities in the boles of trees. Already depleted by nearly half when Hugo knocked down or snapped many of the birds' nest trees, the population now faced a heightened threat from predators as the developing understory of young trees reaching about 20 feet provided easy access to the nests.

"The birds won't live in a situation like that," Dent explained. "They'll simply move out."

Prescribed burning was out of the question to combat the problem because of smoke and the resulting visibility issue on roadways. In any case, the emerging buds of young Loblolly Pines in stands of trees less than about 15-20 feet could not withstand the impact of fire.

"So that meant the only option was to go in and mow the understory down with masticators," Dent explained. "Our idea was just to start in along the major highways and in places we knew to have a high potential for wildfire around communities or travel ways, and also in Red-Cockaded Woodpecker communities."

Meanwhile, the Santee Cooper electric utility was facing its own hurricane-induced mess with the emergence of whole floating trees from the lake bed of Lake Moultrie, the result of violent wave action on standing timber that had simply been submerged rather than cut when the lake was created. The churning waters created by the hurricane had uprooted the trees and littered them on the shoreline.

Plant managers at the Jefferies Generating Station near Moncks Corner, SC, hatched the idea to grind up the timber and burn it in their coal furnaces.

"They figured they could consume it that way as well as get a little bit of power out of it. So that's exactly what they did. Ultimately they discovered they could reduce their coal expenses by using a mix of 90% coal and 10% wood," Dent said.

A Natural Solution

So it was a perfectly reasonable that all these years later Santee Cooper would alert to the sudden potential availability of volumes of biomass, and they expressed an interest in buying the chipped material. Smaller companies in the wood industry

took note of the potential market too, and began laying plans to provide a service grinding the debris and hauling it to the power company.

"That dovetailed nicely with stewardship," Dent said. "The program allows you to sell a product and buy a service all in the same contract. What we were selling, of course, was the chips, but we were buying the act of thinning; we hired them to thin the stand the way we needed it thinned. They used conventional logging equipment and thinned similarly to the way they would a pulpwood stand. They'd leave the dominant, best trees, then collect the rest and feed it into a chipper - all of it, the needles, branches, twigs and bark. Then they'd haul it to the mill to generate operating power."

That successful practice continues, generating more interest as enterprising loggers and equipment operators take note of its success.

What's next?

An increasing interest in the biomass program seems inevitable given the national spike in fuel costs, the impact of climate change on drought patterns and the potential for catastrophic weather events such as the broad inland reach of hurricanes like Hugo and Andrew. Dent sees the potential for widespread interest.

"There's always been a potential economic breaking point based on the price of a barrel of oil," he said. "They used to toss around the \$80/barrel figure, after which they thought it'd be worthwhile to start using biomass other than just for energy. It'd make it economical to produce what they call green diesel and other kinds of fuel that you can burn in vehicles."

Local contractors haven't created anything on a large scale yet, Dent said, but in addition to working on a chip fuel contract for the paper companies, he's working on another contract to develop a process called torrefaction. A U.S. Department of Agriculture grant and researchers from NC State associated with the process are working to find a way to make this process feasible on a large scale.

In essence, the process heats wood chips at a low temperature, driving off gases and water. The gases, in turn, are recaptured to continue the heating process.

"The end product is the chip, basically intact, but free of moisture so it comes out as sort of a charcoal substance still retaining nearly its original btu content," Dent explained. "Just like coal, it can be ground into a fine powder and burned in the ignition chambers in the plants. It's cheaper to use because of the haul costs. If you can get local wood to fuel a plant you don't have to ship coal from West Virginia down here. It's just a small thing right now, but it's an example of the kind of possibilities you can get into when you look into using biomass."

Despite the 10 billion dollars in damage caused by its winds in 1989, Hugo may now be contributing to infrastructure in the very areas it once devastated through the conversion to energy of the debris it left in its wake.

Dent remains humble concerning his role in all this, and is quick to point out the contribution of ideas from individuals at the regional and district levels and from the contractors themselves. Though his accomplishments in the biomass program and local stewardship recently earned him a national award as Stewardship Contracting Champion of the Year, Dent downplays his achievement.

"We just had to figure out how to get a mess cleaned up," he said, "and the chain of events naturally led us this way. When you work out on the forest, there are endless possibilities to improve things."