



THE
AMERICAN
CHESTNUT
FOUNDATION



Appalachian
Regional
Reforestation
Initiative



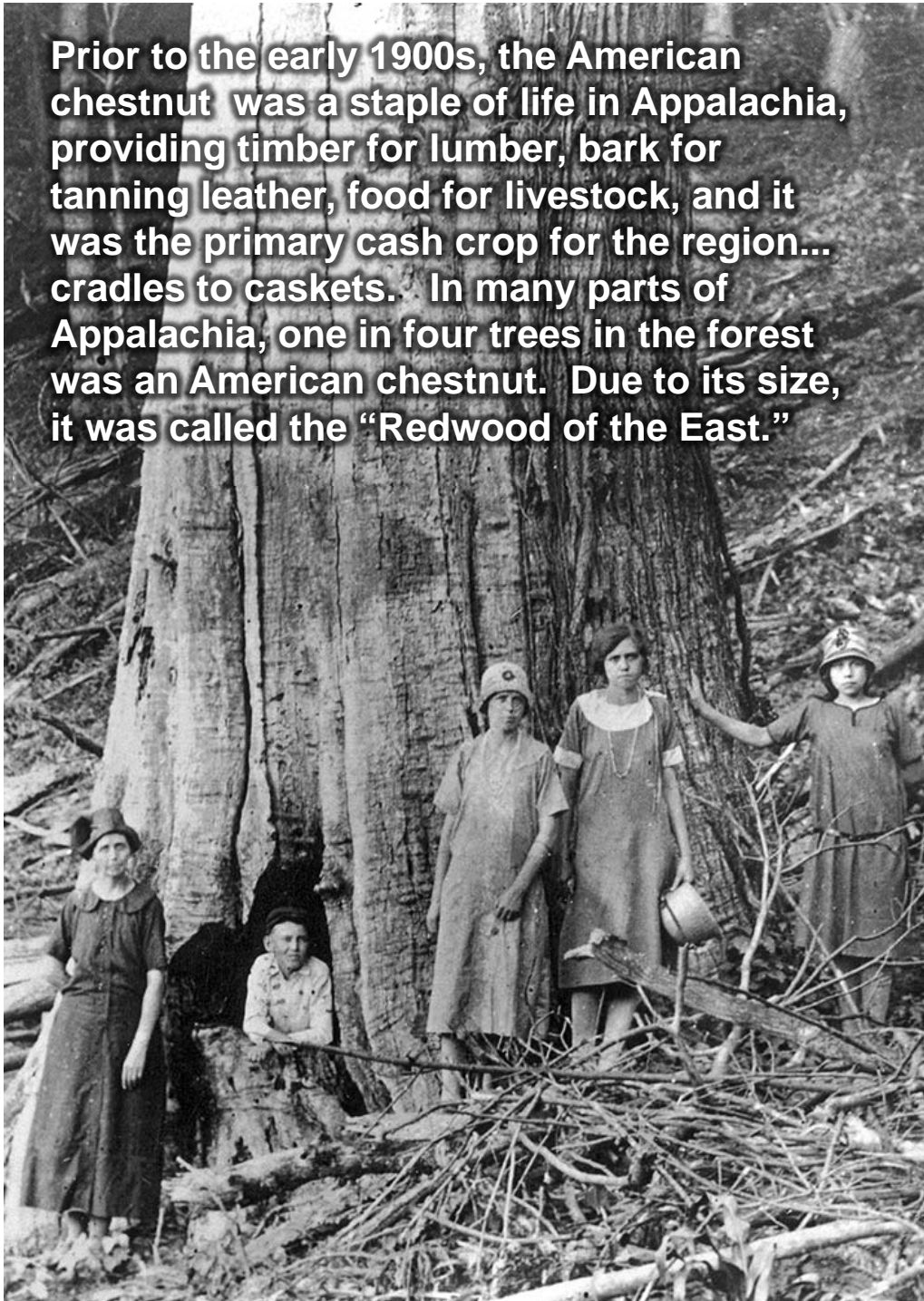
*Site reclaimed by the
Forestry Reclamation
Approach (FRA) after
5 years of growth*



Operation Springboard: Restoration of the American Chestnut on Reclaimed Mined Land in Tennessee

by Barry Thacker, P.E.
Schnabel Engineering, LLC
Knoxville, TN

Prior to the early 1900s, the American chestnut was a staple of life in Appalachia, providing timber for lumber, bark for tanning leather, food for livestock, and it was the primary cash crop for the region... cradles to caskets. In many parts of Appalachia, one in four trees in the forest was an American chestnut. Due to its size, it was called the "Redwood of the East."



*Where there be mountains, there
be chestnuts.*
(Hernando De Soto, 1542)

Chinese chestnuts brought to New York City in 1904 carried a fungus, which proved deadly to the American chestnut. By the 1940s, the species was nearly destroyed.

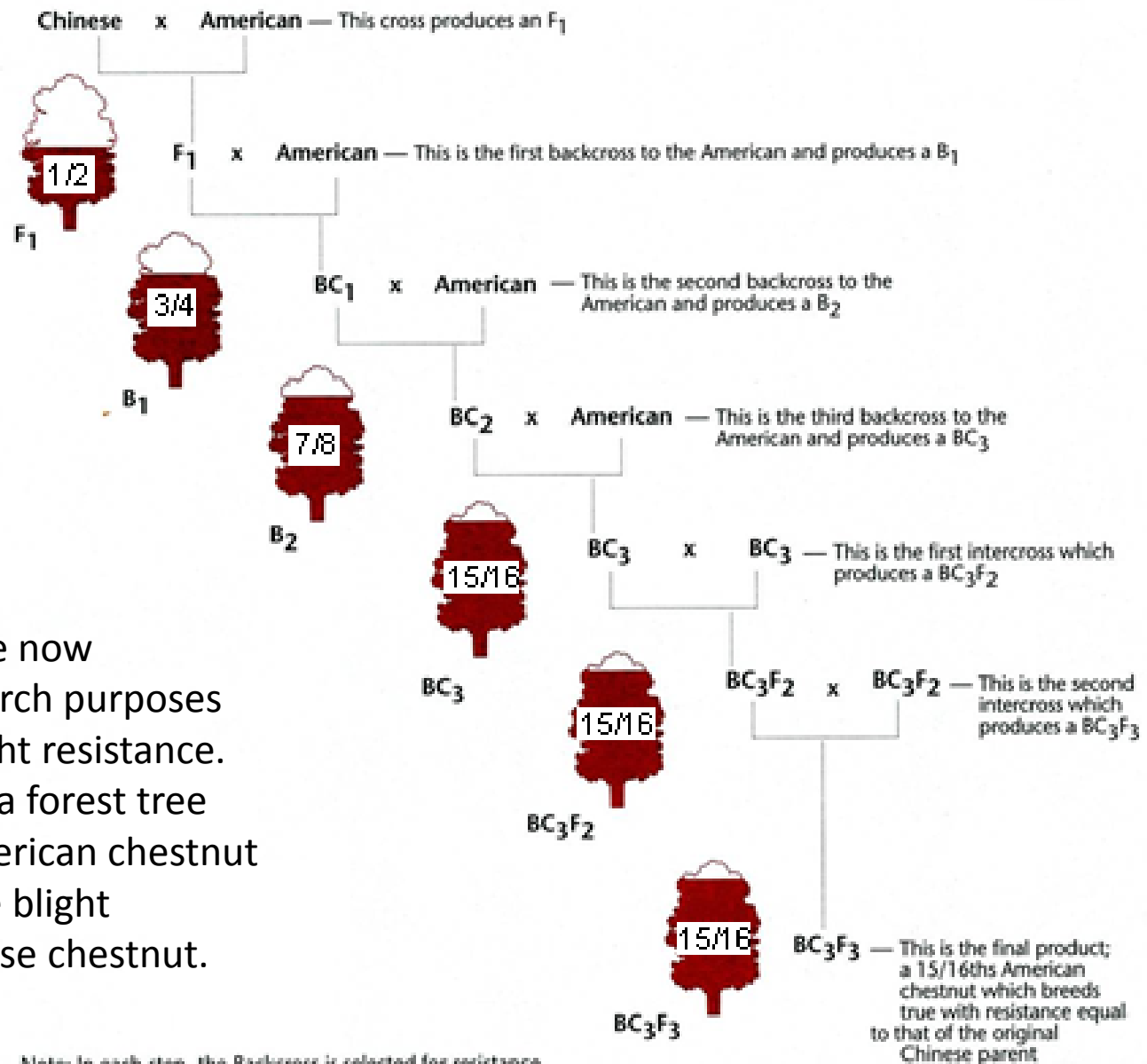
**American chestnut
blight pandemic**



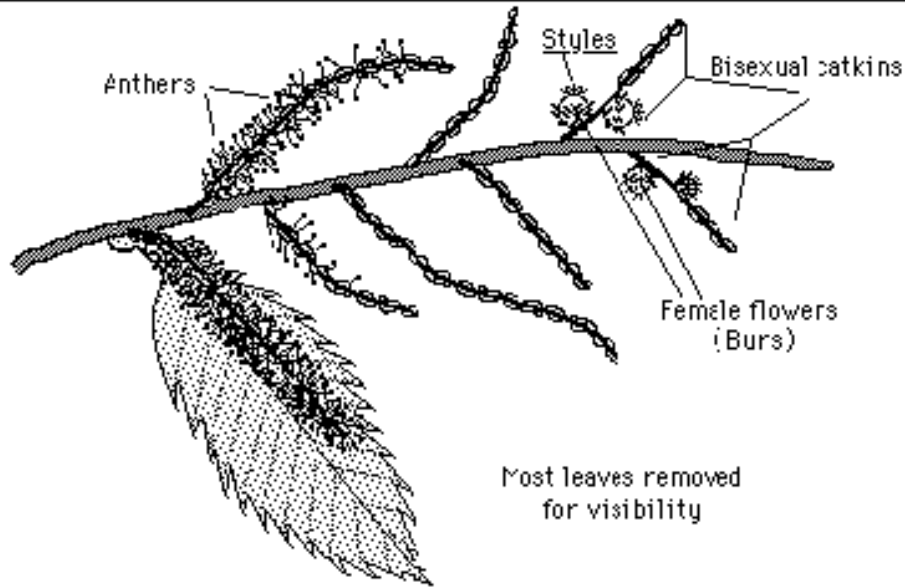
THE AMERICAN CHESTNUT FOUNDATION'S BACKCROSS BREEDING PROGRAM

For the past 35 years, the American Chestnut Foundation (TACF) has been backcrossing and intercrossing Chinese and American chestnuts to produce a blight-resistant hybrid that is 94% American chestnut.

The 15/16th hybrids are now available, but for research purposes only to verify their blight resistance. The goal is to produce a forest tree comparable to the American chestnut in stature, but with the blight resistance of the Chinese chestnut.



Note: In each step, the Backcross is selected for resistance. Trees indicate fraction of American genes.



Two trees are needed for production of viable nuts.

Catkin flowers from one tree can pollinate burs from another tree, but a single tree can't pollinate itself.

American chestnuts and Chinese chestnuts flower at different times of the year, so humans need to help cross-pollinate the two species.



Mature bur containing a chestnut



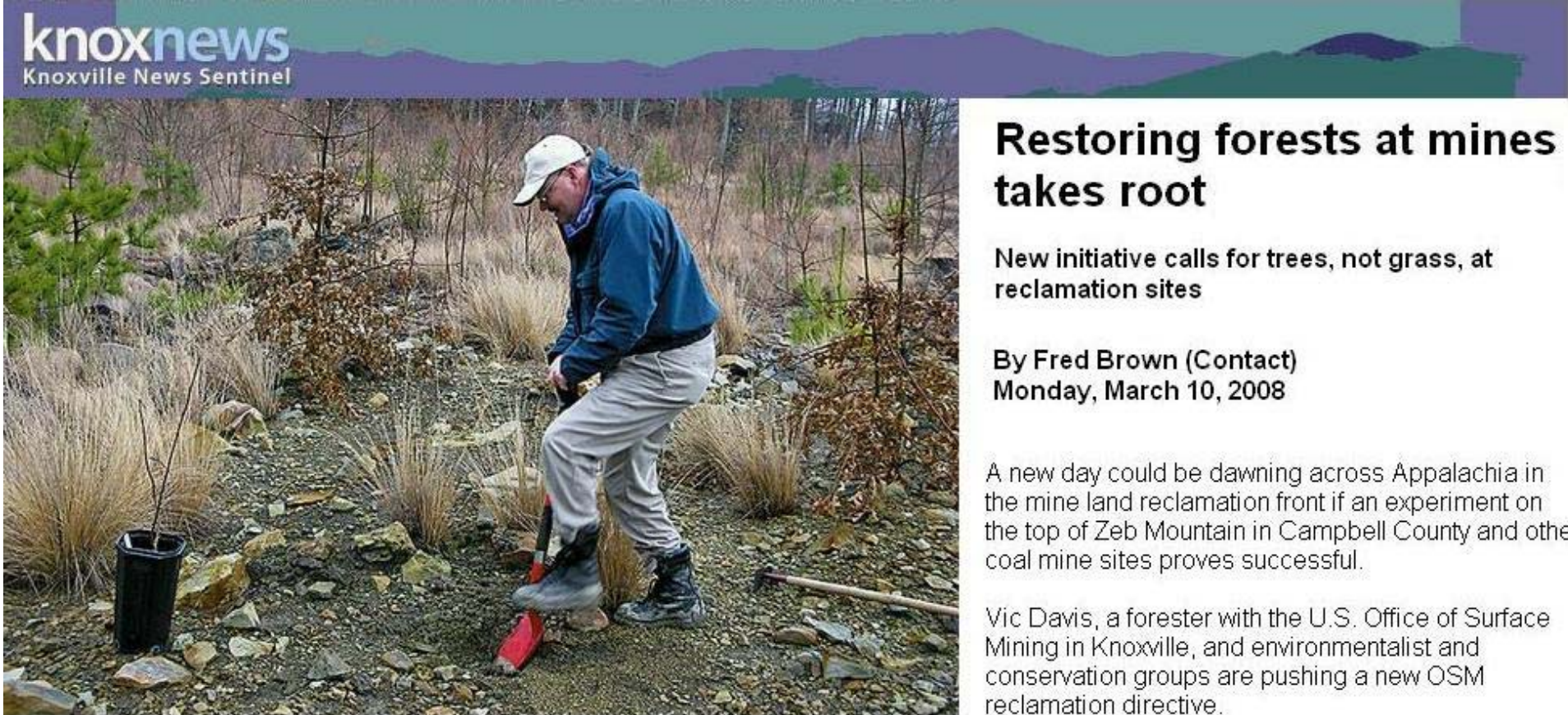


Backcross method...



Hybrids grown in orchards are inoculated with blight fungus to identify those immune to the blight. Those that are susceptible are cut up as firewood.

So, where will the blight-resistant hybrid American chestnuts be planted so they can spread to surrounding forests? Reclaimed surface mine land prepared by the Forestry Reclamation Approach.



knoxnews
Knoxville News Sentinel

Restoring forests at mines takes root

New initiative calls for trees, not grass, at reclamation sites

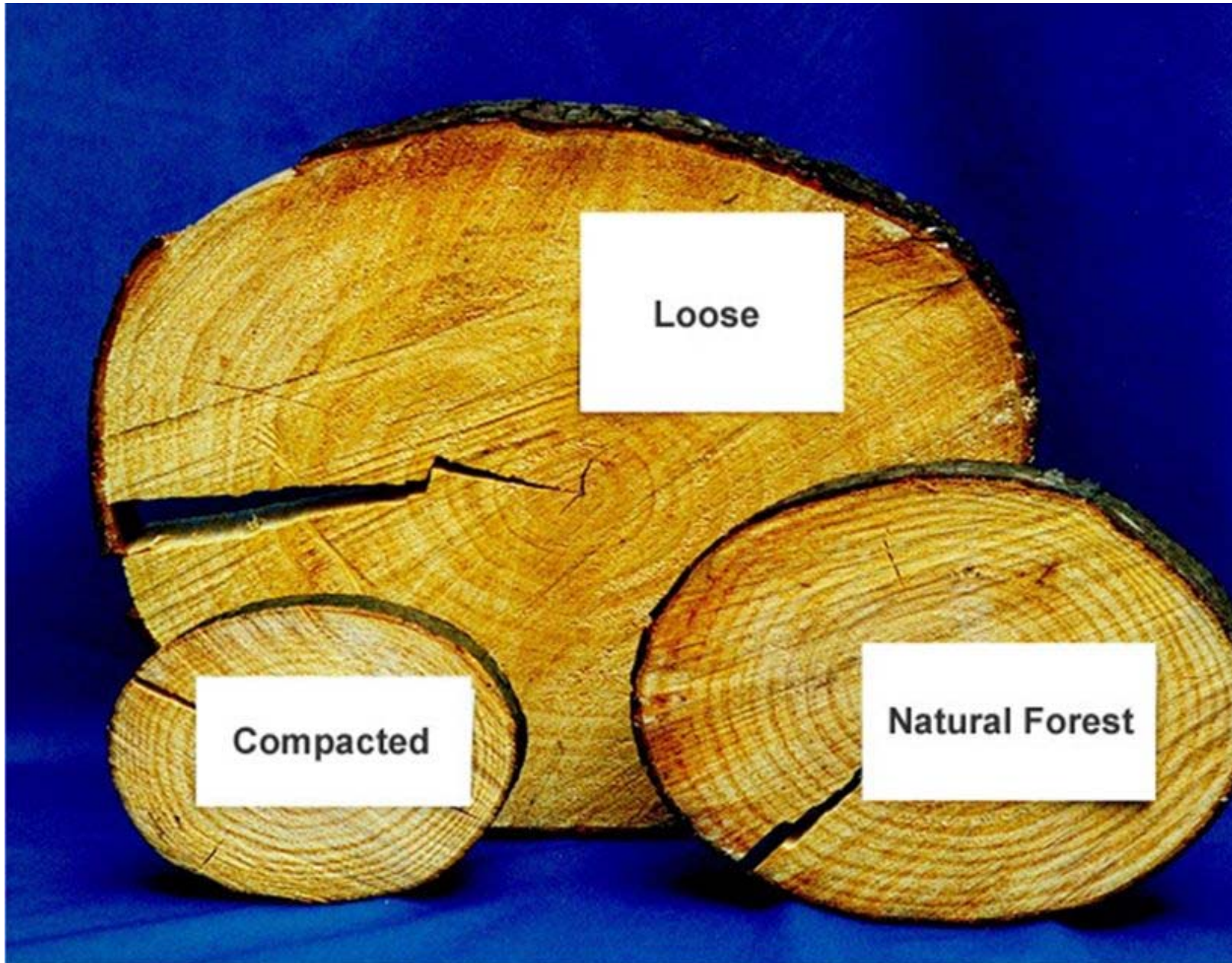
By Fred Brown (Contact)
Monday, March 10, 2008

A new day could be dawning across Appalachia in the mine land reclamation front if an experiment on the top of Zeb Mountain in Campbell County and other coal mine sites proves successful.

Vic Davis, a forester with the U.S. Office of Surface Mining in Knoxville, and environmentalist and conservation groups are pushing a new OSM reclamation directive.

Barry Thacker, founder of the Coal Creek Watershed Foundation of Knoxville, plants the first American chestnut on a reclaimed mine site in Campbell County. The site was once mined by Tampa Electric Co., which has its headquarters in Kentucky. The land was part of a new planting method in which the soil was not packed down by heavy bulldozers after the mining operation was completed. Trees have sprouted and it is thought that this new type of planting will also allow the American chestnut to come back to its natural range.

That ruling, handed down March 2, requires certain reclamation sites to be planted with trees instead of grasses in hopes that this will return destroyed mountaintops and abandoned mine lands to successional hardwood forests.



Researchers have found that trees grow twice as fast in the loose-rocky ground at sites prepared by the Forestry Reclamation Approach than in a natural forest.



**100% of the surface-mined
land in Tennessee is now
reclaimed by the Forestry
Reclamation Approach**

**Tennessee reclaimed mine site after 7 years of growth from
commercial planting of hardwood bare-root seedlings**



Reclaimed surface mine in Tennessee after 50 years of natural growth with mature hardwoods as the predominant cover

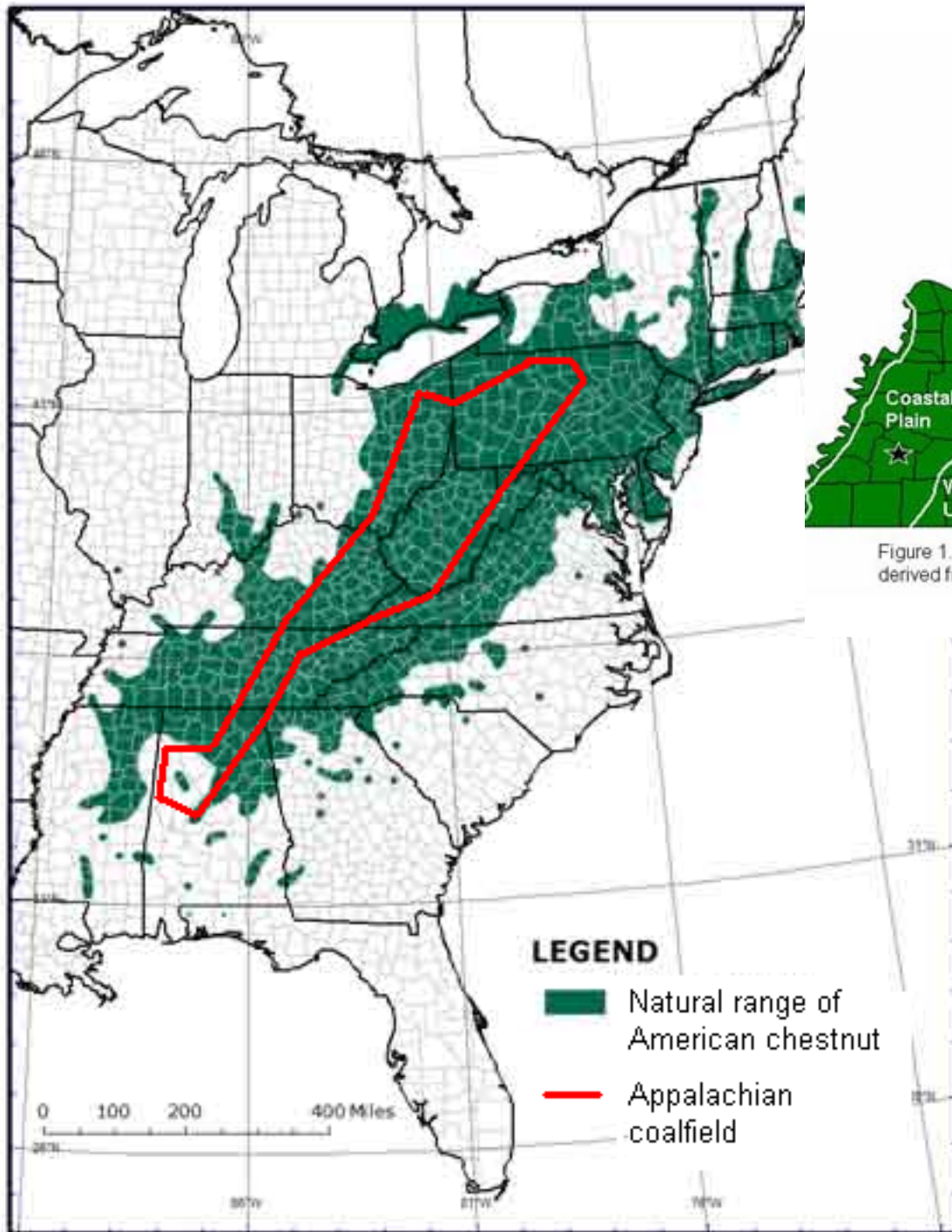


Figure 1. Pre-blight abundance of *Castanea dentata* in Kentucky and Tennessee, derived from Rhodes and Park (2003) and Ashe (1911).

WHY SURFACE MINES?

Because plantings on reclaimed surface mines provide a way to introduce blight-resistant hybrids throughout the natural range of the American chestnut where they can spread to surrounding forests



Blue tubes mark locations where American chestnuts were planted during 2008 public planting event at Zeb Mountain reclaimed surface mine in Campbell County, whereas green mesh tubes show additional plantings for research study led by Dr. Jennifer Franklin of UT.

Students at East TN schools set up indoor American chestnut nurseries in 2009, including the project, “engineering a better chestnut pot.”



Transplanting potted American chestnuts at Zeb Mountain FRA Site in 2009



Despite heavy rains for two weeks prior to this field trip, water had already soaked into the loose, rocky spoil at this FRA site to irrigate tree roots as evidenced by the fact that none of the students got muddy and neither did the sedimentation pond...



***Observing a shot being put off during
2009 field trip to Zeb Mountain FRA Site***

Project Rooted in History: American chestnut seedlings test blight resistance

By Bob Fowler , May 18, 2009

PIONEER, Tenn.- Students from two counties planted an American legend in a windswept wasteland atop Zeb Mountain last week.

Much of their efforts to coax American chestnut seedlings into growing in rocky mine spoils are doomed to fail, Barry Thacker said.

But the strong that survive will help in the decades-long attempt to restore chestnut trees. They'll give clues on how best to plant a hybrid, blight-resistant variety that will soon become widely available, said Thacker, president of the Coal Creek Watershed Foundation.

"It's ugly," Thacker said of the site. "It's a pile of rocks, but it's Nirvana to the chestnuts," he said. "Looks don't count in this situation. Come back in 20 years, and you'll have a forest here." Research shows trees grow faster on reclaimed mine sites where soil is left loose and rocky, Thacker said.

"Anything we can do to bring these (chestnut) trees back would be great," said Tim Rudder, reclamation specialist with the U.S. Office of Surface Mining. "It will pay dividends down the road."

"It's a really fun activity," Lake City Middle student Holley Smith said as she and classmate Kimberly Phillips finished planting a seedling last week. "I think it helps our environment a little bit."



Elk Valley Elementary School students Courtney Seymour, Brittany Vaughn, Olivia Veach and Natasha Taylor, from left, brave strong winds on Zeb Mountain in Campbell County as they plant American chestnut seedlings they grew as part of a project.



Students Justin Gibby, left, and Joshua Goodman plant an American chestnut seedlings atop Zeb Mountain.



**31% survival
rate of
American
chestnuts
after 5 years
of growth at
Zeb Mountain
demonstration
site**

**NOTE: No
ground cover
grasses were
planted on
this site so
as not to
compete with
the American
chestnuts.**



WBIR.COM

Straight From The Heart
A GANNETT COMPANY

Planting event in Claiborne County, TN.





After blight-resistant American chestnut hybrid trees grow on reclaimed mine sites, squirrels will collect and bury their nuts in surrounding areas to spread the range of the tree as was done in nature prior to the blight.



With your help in growing and planting American chestnuts, maybe someday your great-great grandchildren will once again be able to marvel at the wonders of an American chestnut forest.