

Cortez Journal

High temperatures contribute

to Mesa Verde pinyon die-off

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Increasingly high temperatures plus periods of drought probably were the major factor in the death of more than half of the pinyon pine trees at Mesa Verde National Park in 2003.

A 2000 to 2003 study titled "Regional Vegetation Die-Off in Response to Global Change-Type Drought" suggests hotter temperatures and drought likely will result in fast changes to the ecosystem and could result in global climate change. The study was released Sept. 7 and is authored by lead-writer David Breshears, a professor of natural resources at the University of Arizona's School of Natural Resources in Tucson and a member of UA's Institute for the Study of Planet Earth, and co-written by Lisa Floyd-Hanna, of Durango.

"This combination implicates global warming," said Floyd-Hanna, who has worked as a scientist for Mesa Verde since 1989. "We think that future droughts will be more common and with higher temperatures."

While the ongoing drought is comparable to those from the 1930s and 1950s, increased temperatures and significantly less moisture results in a high die-off rate of pinyons and junipers, linked with an influx of beetle infestation, Floyd-Hanna said.

"Previous droughts have not been accompanied by rising temperatures," she said. "Mesa Verde has been one of the hardest (regions) hit by the drought."

An average of 53 percent of the pinyon population perished in 2003 at Mesa Verde, according to Floyd-Hanna, who added the percentage includes those that are only knee-high and above.

Dry conditions put the trees under so much water stress that the attacks from bark beetles finish them off. Under such scenarios, the trees cannot make enough pine sap to defend themselves against the insects.

At study sites in Arizona, Colorado, New Mexico and Utah, researchers discovered that from 40 percent to 80 percent of the pinyon trees died between 2002 and 2003. Researchers confirmed the regional die-back of the trees through aerial surveys, on-site study locations and analysis of satellite images of those states' pinyon/juniper woodlands.

U.S. Forest Service aerial surveys of the four-state region's pinyon/juniper woodlands in 2002 and 2003 revealed significant tree die-off covering more than 4,600 square miles.

Twenty-three sites at Mesa Verde gauge regional drought conditions, said Floyd-Hanna, a professor of environmental studies at Prescott College in Arizona. Four of the sites are on Ute Mountain Reservation land within the park.

In the Four Corners, maximum annual temperature trends, summer temperatures and the minimum annual temperatures are significantly greater during the 2000 to 2003 period than they were in the last big drought, 1953-1956, Floyd-Hanna said.

On a more positive note, Floyd-Hanna indicated an influx of germination among pinyons in 2005.

"They are producing cones for the first time (since about 1999)," she said. "There is a positive response to precipitation this year, and recovery is starting."