The Salt Lake Tribune

Ancient oak serves as impartial witness to Utah's climate history

5,000-year-old tree at This Is the Place a living fossil

By Glen Warchol
The Salt Lake Tribune • July 2, 2007 1:31 am

Most visitors come to This Is the Place Heritage Park for a glimpse into the past - the buildings and artifacts of pioneer life 150 years ago.

But when Chuck Wullstein hikes Emigration Canyon's "living history" park, it's to visit a living fossil from 50 centuries ago.

Wullstein, a retired University of Utah biology professor, discovered a rare and ancient hybrid scrub oak that has made its home for centuries a few feet east of the park's historic Mary Fielding Smith house. The tree looks more like a tall, gnarled shrub and covers nearly an acre. "It's one organism basically," Wullstein says. "It's one oak."

As trees go, the 15-foot-high tangle of oak branches is not particularly impressive. But scientists say the oak offers a glimpse into the Great Basin's warm climatic past and a clue to its possibly even warmer future. The hybrid, the result of a romance between an unlikely couple, has fascinated Utah biologists for five decades.

The rare hybrid - only about a dozen exist between St. George and Salt Lake City - is a 5,000- to 7,000-year throwback to a time when Utah and the Great Basin were warmer and wetter.

"This tree is significant because it provides evidence of climate change," Wullstein says. "There had to be a warm climate for it to be here."

Scientists say the oak also bears witness to a phenomenon that many humans have trouble comprehending - or simply don't want to accept: The earth's climate has changed drastically several times over the eons along with its ecosystems. And it's happening again.

"We live with a world view that the things that are around us are the way they have always been and always will be," says Ron Neilson, an Oregon State University-based bioclimatologist for the U.S. Forest Service.

Neilson did ground-breaking research on the Great Basin's scrub oaks and climate at the U. Now, he travels the country speaking to scientists and politicians about global warming.

Though global warming is still politically controversial, most scientists agree the earth is warming. They differ on how much of the effect is from man-made greenhouse gases.

In fact, Neilson and his former teacher Wullstein don't even see completely eye to eye on it.

"Man is responsible for some of the warming," Wullstein says. "Ron cannot tell you what percent of warming is due to carbon dioxide [produced by humans]."

For those easily depressed by discussions of global climate change, this also is the story of a botanical romance that ended when Utah's climate cooled. In a plot worthy of daytime television, the warmth-loving scrub oak *Quercus turbinella*, commonly called canyon live oak, moved north into the Great Basin in the warm days of yore. There it met the cold-resistant *Quercus gambelii* or Gambel oak.

"They met here on the Wasatch and hybridized," says Wullstein, leaving to our imagination the intertwining of oak leaves and pollination.

But when the climate cooled again and frost became a regular part of the ecosystem, the canyon live oak's range retreated south to what is now Utah's Dixie.

That climate change should have killed the oaks' *tubinella-gambelii* love child. But fewer than a couple of dozen hybrids managed to hang on in warmer, wetter pockets in the Wasatch and Oquirrh mountains to be discovered in 1954 by botanist Rudy Drobnick.

A team of biologists led by legendary U. of U. biologist W.P. Cottam confirmed it was a hybrid by painstakingly artificially pollinating the oaks and raising the offspring in a greenhouse. "Biologists came from all over the world to see them," Wullstein says. The public can visit those famous artificial hybrids in the little-known Cottam Hybrid Oak Grove on the U. campus.

The hybrid Wullstein discovered in the park found sanctuary near a small watercress-ringed spring that provides the moisture it needs. The tree gets a little additional warmth because it is at the elevation of the valley's warm inversion layer.

Fearing the tree, like many of its siblings, would be destroyed by land development, Wullstein tagged the tree and alerted the park's managers.

"These trees are important because they are living fossils," says Neilson. "They are literally five or six thousand years old and they are still living."

Rod Clifford, spokesman for the park, says managers are aware of the hybrid. "We are committed to making sure they are protected and kept safe," he says.

Wullstein would like to see the tree and all the park's native plants be identified and protected for visitors. "It would be just lovely."

gwarchol@sltrib.com

"These trees are important because they are living fossils. They are literally five or six thousand years old and they are still living."

RON NEILSON

an Oregon State University-based bioclimatologist for the U.S. Forest Service