Ancient Sierra trees barely weathering drought

By Jim Robbins, New York Times

SEQUOIA NATIONAL PARK – High in the Sierra, biologists are struggling to find ways to protect some of the world's oldest and most storied trees from drought, forest fires and climate change.

The trees are the giant sequoias, some of them 2,000 to 3,000 years old, and they are just one of several ancient Western species, including redwoods and bristlecone pines, that face a daunting future.

Although the sequoias are not at immediate risk, even from California's current drought, scientists say they were not built to withstand decades of dry and warming weather. Their seedlings and saplings are susceptible to fires, which are likely to increase, especially at higher elevations. And if the drought persists, the lack of melting snow may keep the seedlings from developing a robust root system.

"If there's long-term drought, within 25 years, we could see seedlings in trouble," said Nathan Stephenson, an ecologist with the U.S. Geological Survey. "In 50 years, the whole population could be in trouble," he went on, and within a century "most of the big trees could be gone."

Sequoias are found in only one place on earth: the Sierra Nevada Mountains in California. There are 65 to 70 groves, most in a narrow 70-mile band on the west side of the range at 5,000 to 8,000 feet. They include one tree here called the General Sherman, the world's largest by volume. Preservation efforts are hampered by the fact that so little is known about big trees, from their root systems to how they die.

As the climate changes, so do conditions in which sequoias and other big trees grow. The coastal redwoods of California, for example, are fog drinkers, taking as much as 40 percent of their water in through their needles. In the past half-century, the number of days in which the trees are shrouded by fog has declined by 30 percent.

In some places, that appears, paradoxically, to be contributing to increased growth: With less fog cover there is more light, said Todd E. Dawson, a biologist at the UC Berkeley. But on the redwood range's southern and eastern edges, which are warmer and drier, scientists are documenting changes in the big trees.

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