Troubled Time for Trees

There lush stands provide refuge for wildlife and their golden foliage illuminates mountains. North American trees are in trouble. Threatened by a host of problems from climate change to invasive pests. A lot of species are under siege.

Out of the 100,000 tree species in the world, the United States has 259 that are endangered.

A variety of wood borers eat their way through different woods.

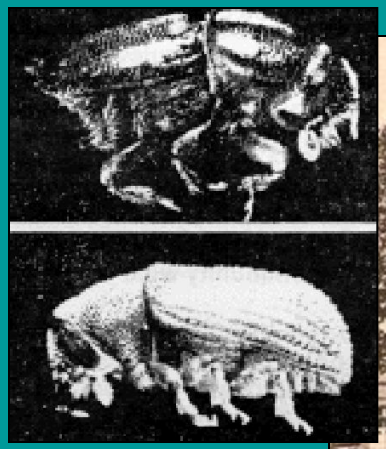
Many of these insects are species specific (preferring only one species). That means they might spend their whole life in the same tree. Others will go from tree to tree spreading an infestation.

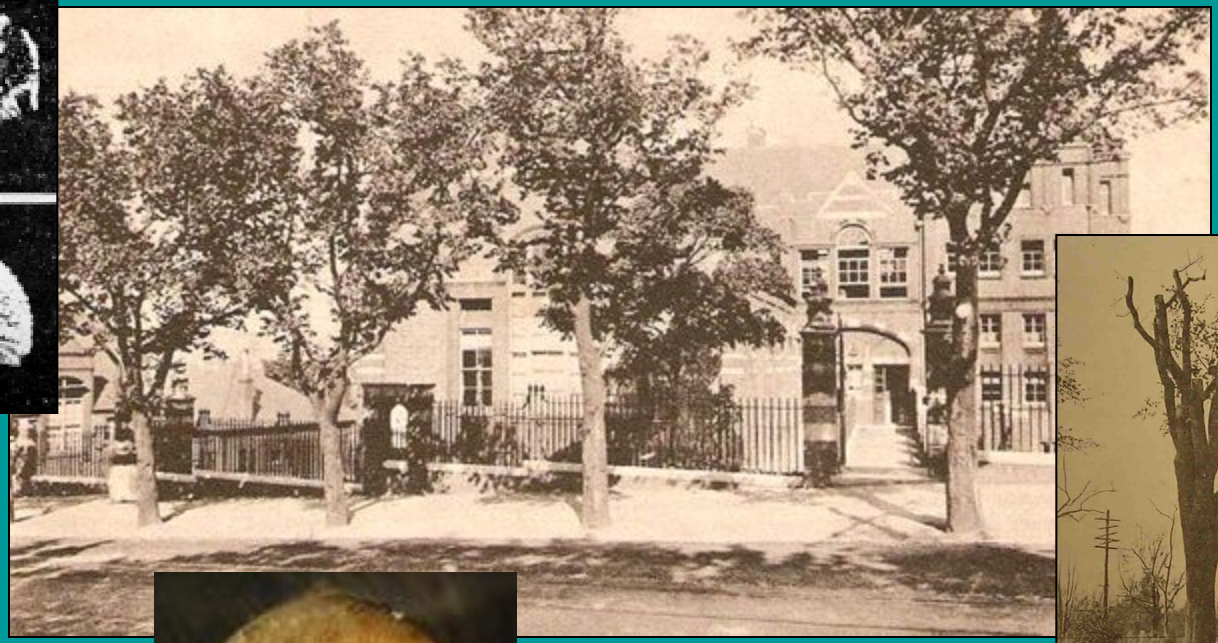
Chestnut

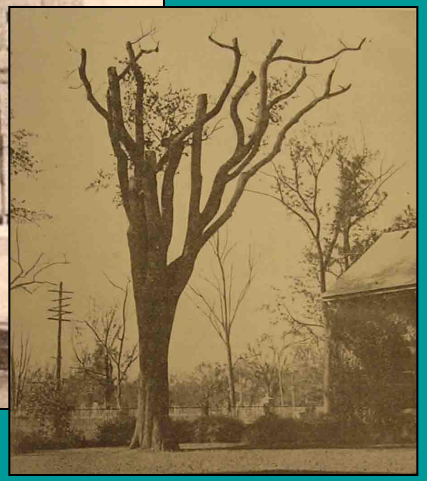
Chestnut trees are being bred with Chinese Elm to make them resistant to some of the diseases that nearly wiped them out.

Dutch Elm disease, canker and bark diseases nearly wipe out the species.

It is alleged that Dutch Elm disease, which devastated the Eastern half of the United States, may have been from the Netherlands or France.







Beetles spread the disease which causes vascular cell breakdown choking the tree to death.

The epidemic took a toll on the stately Elm trees that once lined the streets of small eastern towns.

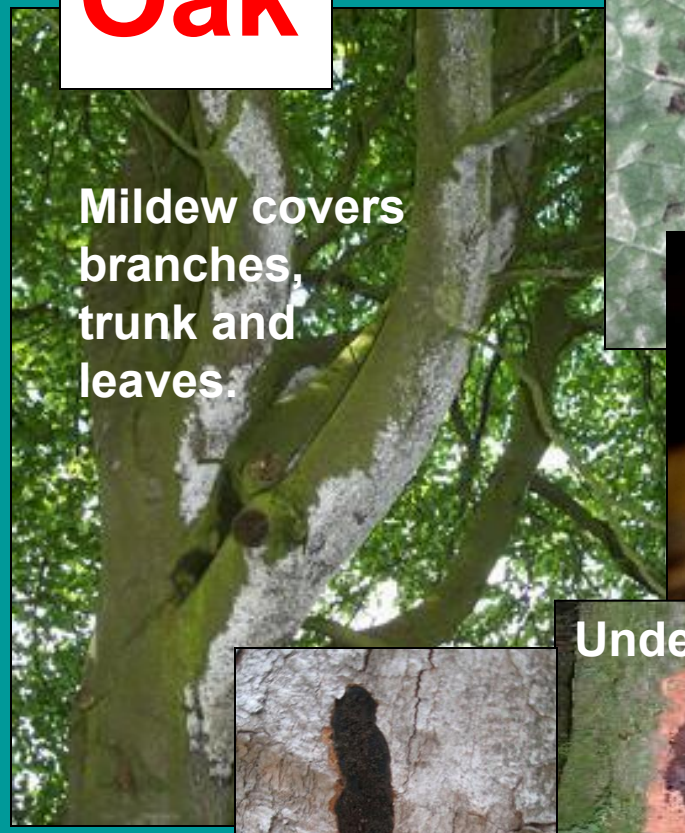
The unstoppable epidemic changes the landscape as it moves westward.

The unstoppable epidemic changes the landscape as it moves westward.

This 1971 photo shows the lush tree lined streets of a small mid-western town.

The same street 1984.

Oak



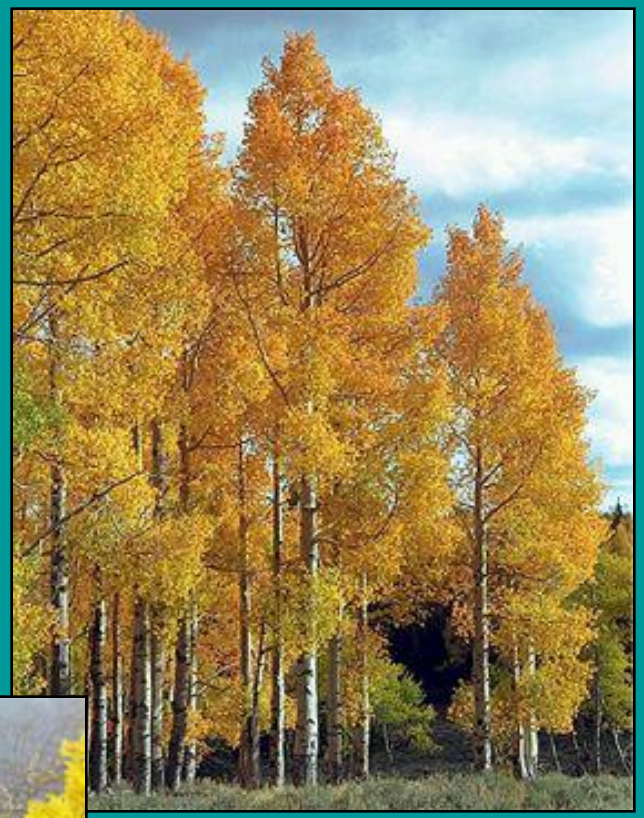
Wind and blowing rain spread spores.

Wind blown mold has killed more than a million oak trees in California.

Insects moving from tree to tree will spread Wilt fungi.

Aspen

60 percent of Colorado Aspens have died off.



Aspen

And now it extends into Northern Arizona.

Foresters looking for cause of aspen die-off

The Associated Press

FLAGSTAFF – The great forest protecters are dying off at an alarming rate in northern Arizona.

Forest Service officials are reporting some 60 percent to 95 percent mortality in low-elevation aspen groves, around 7,000 feet, of the Kaibab and Coconino national forests.

Foresters say aspens are the victim of something called SAD, or Sudden Aspen Decline.

"We are concerned because it's a tree that brings people into the woods. Its aesthetic values are high; it is one of the only trees in the West that turns colors in the fall," said Northern Arizona University forestry graduate student Tom Zegler.

Aspen have an extremely high ecological value. Per acre they provide for a greater diversity of wildlife than surrounding ponderosa pine trees. And because aspen allow more diffused light to reach the forest floor than other trees in northern Arizona, a greater diversity of plants can grow beneath them.

Drought and warmer temperatures may be playing a role in SAD, in turn making the trees more vulnerable to pests and pathogens.

Most climate models predict a warmer and much drier future climate in the Southwest and extreme events, such as droughts, are expected to increase in frequency and magnitude.

"Aspen in Arizona have been hit by a multitude of stressing agents over the last decade," said Forest Service Southwest Region Plant Pathologist Mary Lou Fairweather. "In addition to drought, there was a late-season frost event in 1999 and several years of defoliation by the western tent caterpillar."

Researchers say deer and elk aren't helping the aspen either.

"Compared to conifers, aspen are tasty and more nutritious. The leaves are easier to digest and the chlorophyll-containing bark is itself a food source," said Zegler.

Researchers don't know if root systems have been damaged by SAD – whether through climate change, insects, diseases, browsing animals or lack of frequent fire – to the point that aspen groves won't sprout new suckers. If a root system dies, they fear that particular DNA could be lost forever.

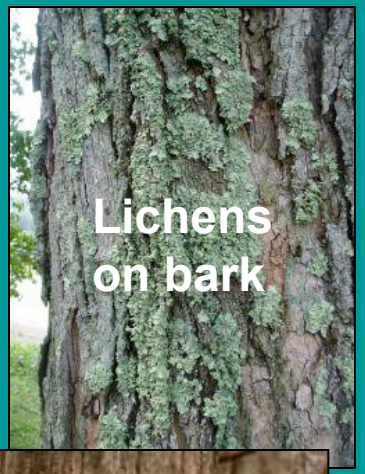
"Since we don't know why SAD is occurring, and what will bring back the aspen, land managers don't want to run fire through or cut down a stand without knowing if the groves will regenerate," said Zegler.

Hemlock

Millions of Hemlock trees have been lost to Woody Adelgid. Researchers have solicited the Ladybug for help.

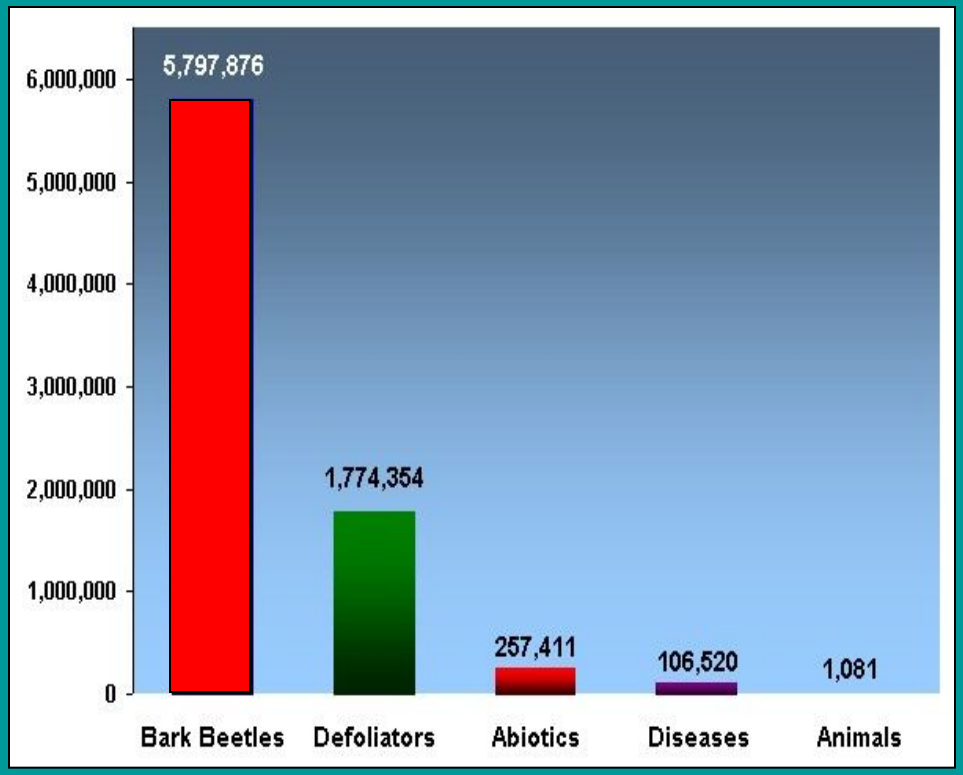
Sugar Maple

Rising temperatures hurt Sugar Maples which could close down the 164 million dollar syrup industry.



Collecting maple sap for syrup making.

Pine, Spruce, Fir



Bark beetles ravage and kill off conifers leading to wildfires.

Recent drought conditions bring on one of the most devastating forest epidemics ever known.

Out west…day after day there is usually sunshine in cloudless skies…

…with occasional cloudiness, teasing, drifting aimlessly rainless overhead...

Bark Beetles

Meet the beetle

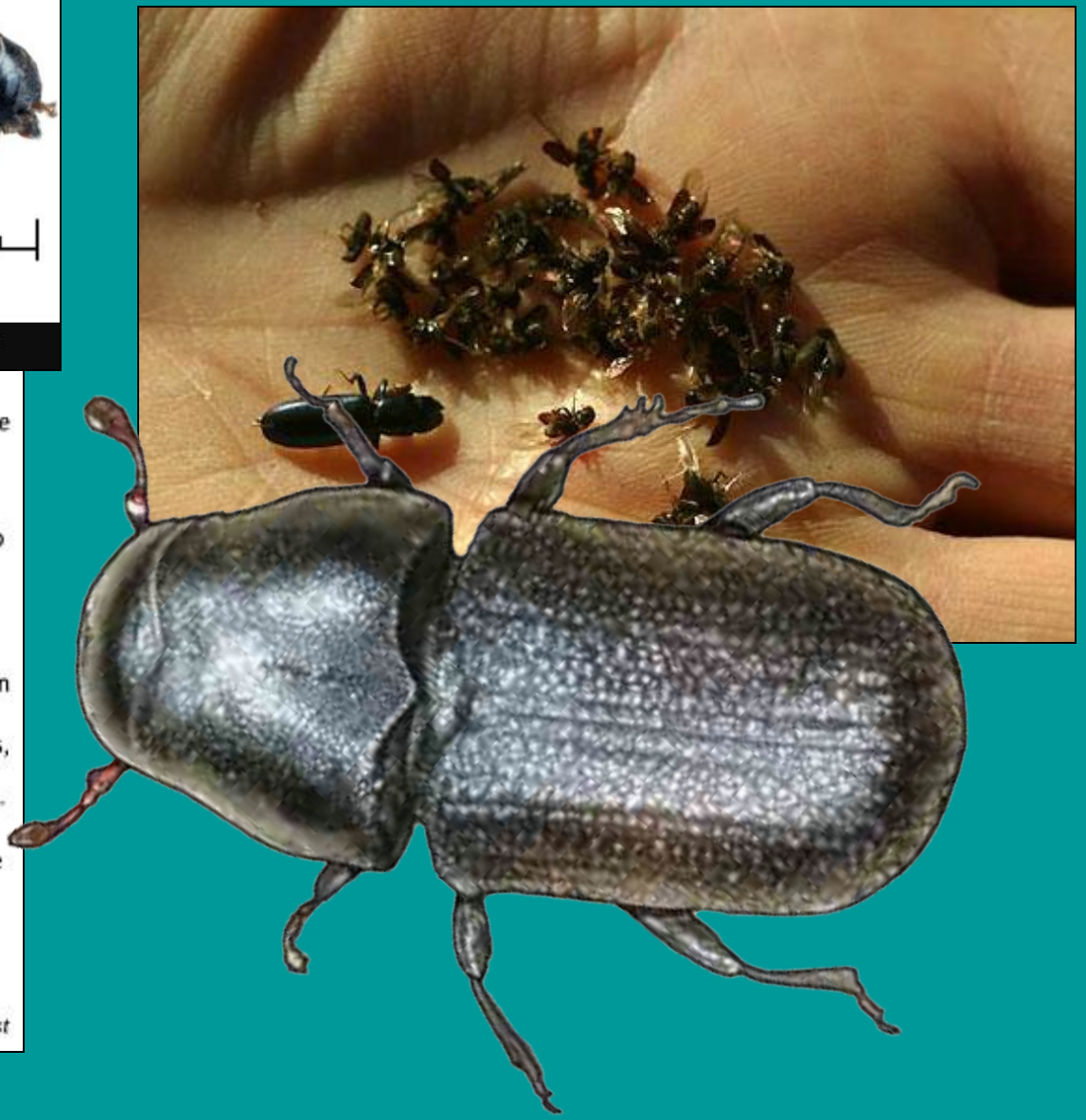
The pine bark beetle is killing trees throughout the West and causing an uptick in the business of tree trimmers who remove the dead and dying timber.

Lifecycle: In late summer, adults leave trees in which they developed to mate and tunnel into living, green trees to lay eggs. Larvae hatch and tunnel to feed, spending the winter under the bark and emerging in summer as adults.

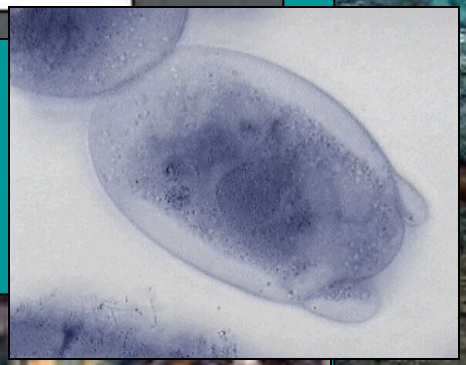
Fungus: Pine beetles, and other bark beetles, carry a blue-tinted fungus that, together with beetle feeding, weakens or kills the trees.

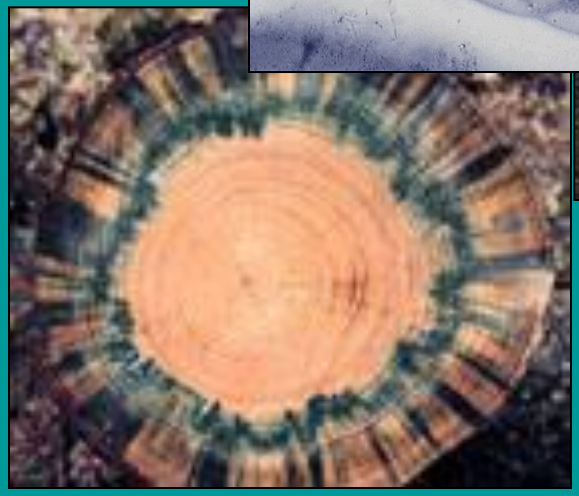
Sources: Colorado State University Cooperative Extension, U.S. Forest Service

Thomas McKay, The Denver Post



Bark beetles carry a blue tinted fungus that can also weaken the tree.





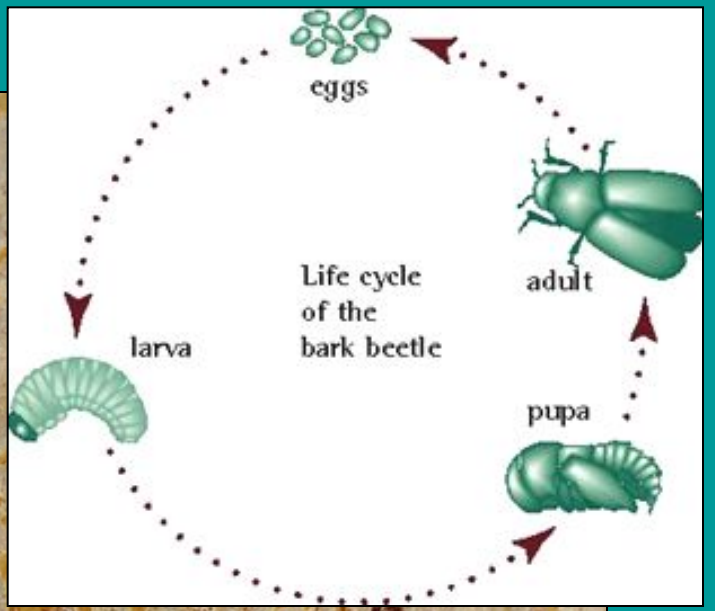
Known to woodworkers as blue stain, the fungus stops as the wood is dried.

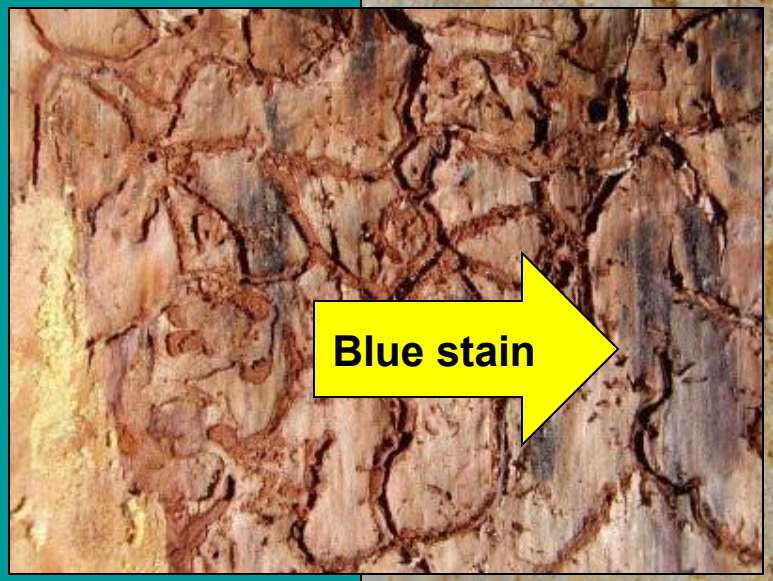
Beautiful grain patterns can be the end result.

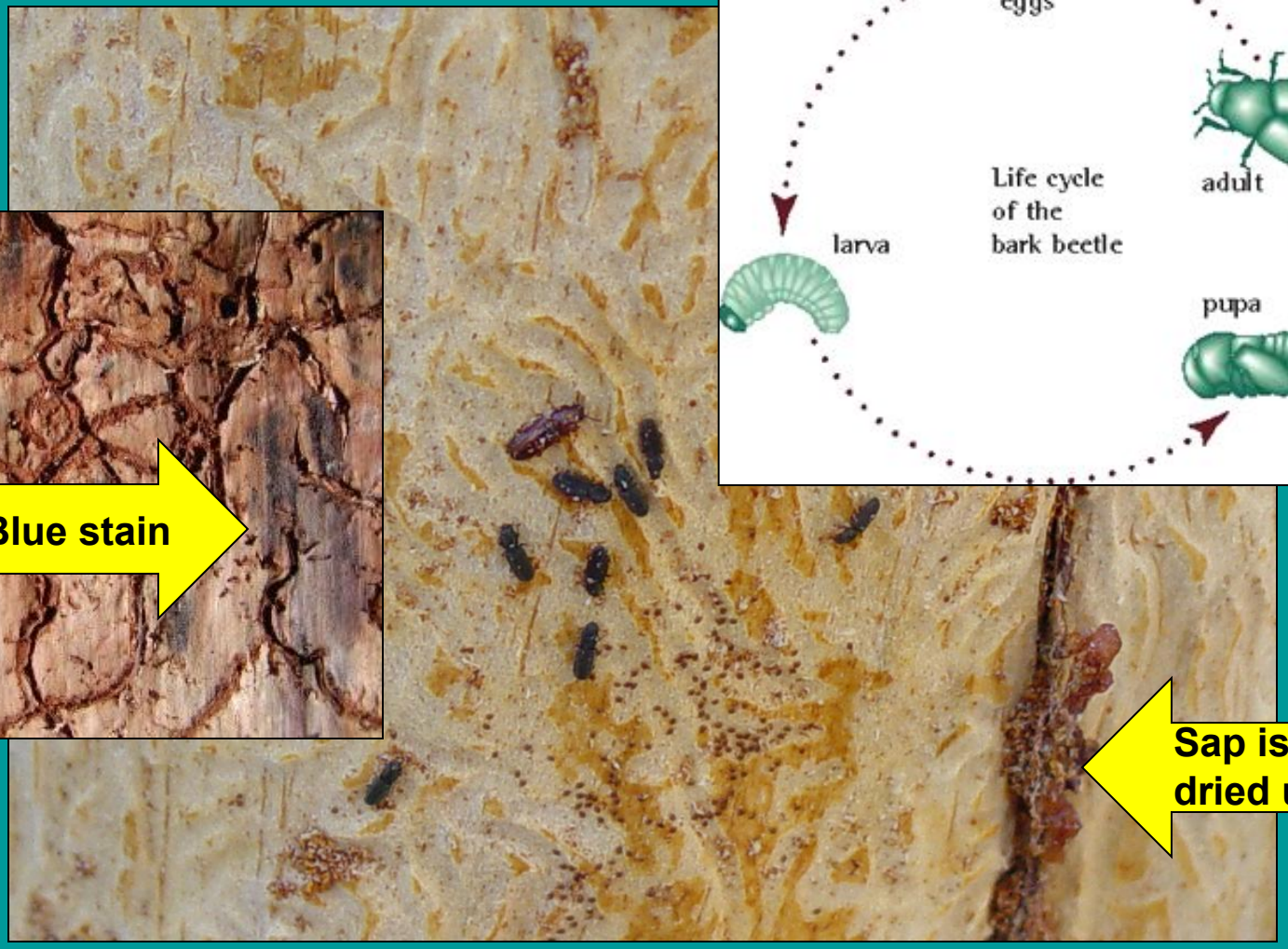
Known to woodworkers as blue stain, the fungus stops as the wood is dried.

A complete life cycle just beneath the bark.

The lack of moisture stresses a tree.







Under normal conditions, the tree usually drowns the invaders in sap.

Severely weakened trees parish.

Causing Forest Devastation

Increasing the chance of fire.

Until the rains return.

While rain brings much needed moisture… humid environments promote fungi.

Fungi breaks down wood as it feeds.

However, Comandra Blister Rust survives in dry climates.

This fungi strangles the life out of Ponderosa pines found in the western united states.

Study: Western forests dying at increasing rate

By JEFF BARNARD
The Associated Press

The bough of a pine trees ravaged by pine beetles is shown against the fall foliage of a stand of aspen trees near Keystone, Colo. Trees in old growth forests across the West are dying at a small, but increasing rate that scientists conclude is probably caused by longer and hotter summers from a changing climate.

David Zalubowski/The Associated Press

GRANTS PASS, Ore. – Trees in old growth forests across the West are dying at a small, but increasing rate that scientists conclude is probably caused by longer and hotter summers from a changing climate.

While the death rate is not noticeable to someone walking through the forests, it is doubling every 17 to 29 years, hitting levels of 0.5 percent to 1.7 percent a year, and was seen in trees of all ages, species, and locations, according to a study published in the Friday edition of the journal Science.

"If current trends continue, forests will become sparser over time," said lead author Phillip J. van Mantgem of the U.S. Geological Survey's Western Ecological Research Center.

"Eventually this will lead to decreasing tree size," he said in an interview. "This is important because it indicates future forests might store less carbon than present. Western forests could be a net source of carbon dioxide, further speeding up global warming."

The rising death rate could also produce a cascading decline in forests that leads to less habitat for fish and wildlife, an increased risk of wildfires, and a vulnerability to sudden forest die-offs, he said.

The likely cause of death for the trees is the increasing average temperature across the West, about 1 degree over the study period, said co-author Nathan L. Stephenson of the U.S. Geological Survey Western Ecological Research Center. That results in greater stress on the trees from lack of water, leaving them vulnerable to disease and insects.

Even if the precipitation remains the same, warmer temperatures mean more rain that runs off than snow that soaks in. Longer summers, typically dry in the West, also mean more moisture in the soil is lost to evaporation.

"So you could conclude that if there is indeed a rising rate of temperature and temperatures continue to increase, very likely mortality rates will continue to rise," Stephenson said.

These continuing effects of a warming climate should make the nation take a new look at its policies on fighting wildfires, thinning forests, and allowing people to build homes in the woods, said co-author Thomas T. Veblen, a professor of geography at the University of Colorado.

The study examined data between 1955 and 2007 in 76 research plots in British Columbia, Washington, Oregon, California, Idaho, Colorado and Arizona. The average age of the forests examined was about 450 years, with some as old as 1,000 years. Of the 59,736 trees counted, 11,095 died over the study period. They included trees that were young, old, at high, medium and low elevations, in wet and dry climates, and of a variety of species, including hemlock, pine and fir.

The death rate was highest in California's Sierras, starting at about 0.9 percent in 1980 and rising to about 1.3 percent. It rose fastest in the Northwest, starting at about 0.7 percent in the 1970s and rising to about 1.3 percent. In the Rockies it started at about 0.2 percent in 1955 and rose to about 0.5 percent.

While the rate of trees dying was increasing, the rate of new trees sprouting and surviving was not, so over a long time there would be a net reduction in the numbers, ages and sizes of trees, the study found.

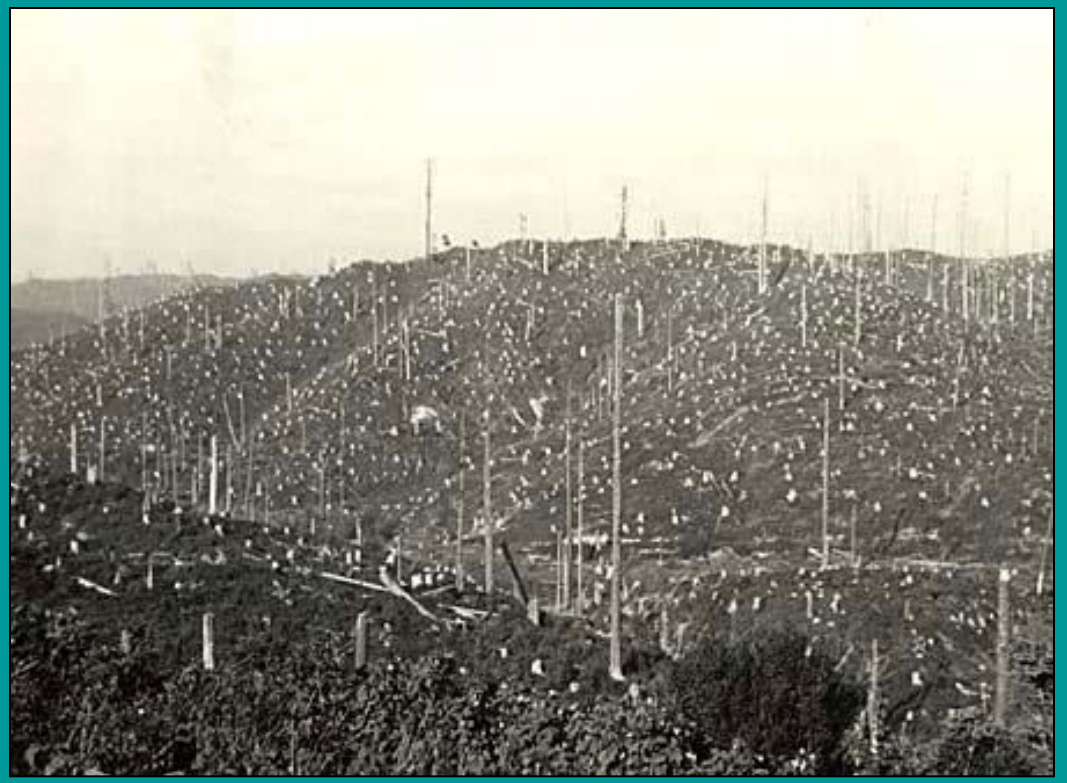
"If it's a gradual process, we may be fine," said Mark E. Harmon, professor of forest ecology at Oregon State University. "If it is a real sudden process, it could be problematical."

"Probably the time for action was yesterday or maybe a decade ago," he said. "We are losing options as we wait."

Jerry Franklin, professor of forest ecology at the University of Washington, noted that old growth forests, particularly those in the Northwest, store tremendous amounts of carbon, making them a resource in combatting global warming.

Man is by far the biggest offender…

..taking down old growth forest…



…clear cutting, strip mining, 4-wheeling, parties in the forest, air pollution all add up to climate change…

…let's face it… we have not been kind to our planet.

In the United States, 30 percent of all forest land is privately owned.

And the aging caretakers are finding it difficult to pass the land on to their children who don’t want the responsibility or lifestyle.

It is predicted that as the land is sold off… a staggering 186 million acres will be vulnerable to development or logging.

Trees make a world of difference.

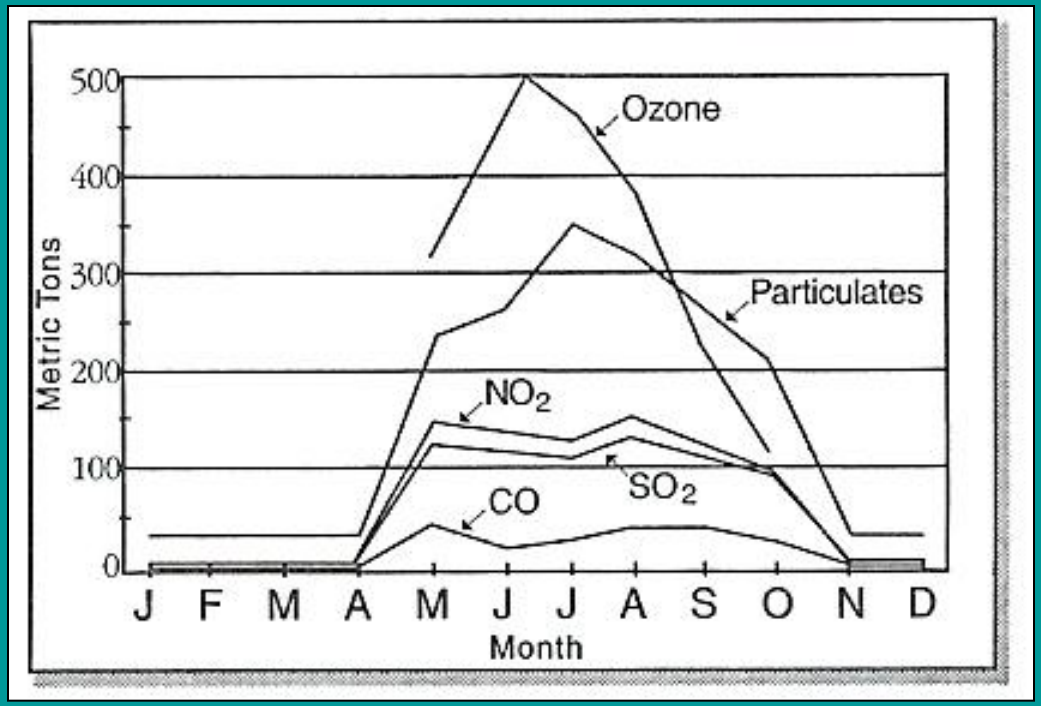
We need more trees for wildlife.

Trees help keep nature part of our everyday lives. Trees provide a nesting site for song birds and food and cover for a wide variety of wildlife.

Trees make a world of difference.

More trees clean the air.

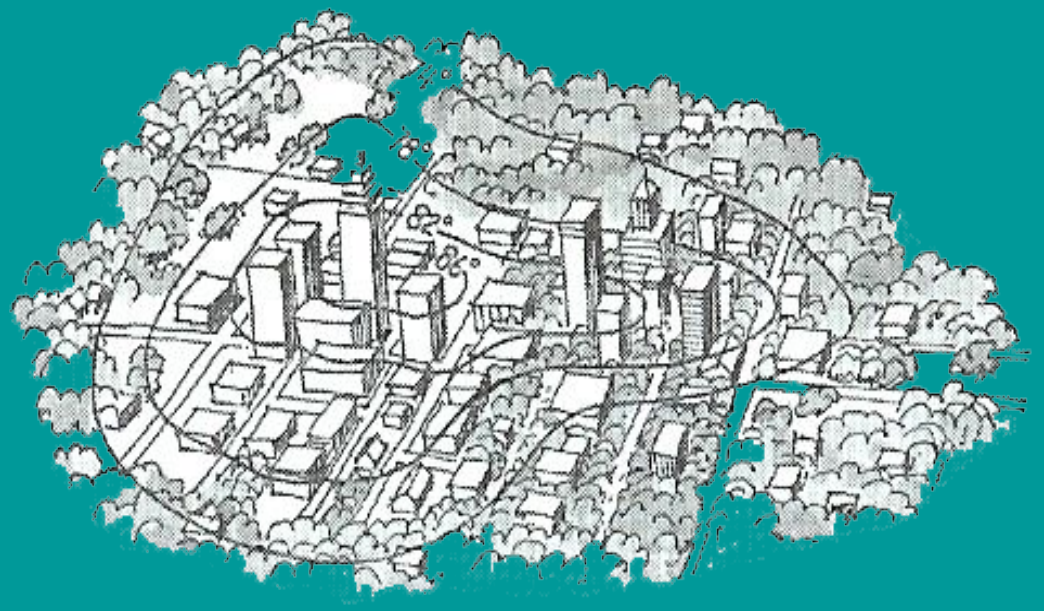
We need trees… they take in C0² and make oxygen. We breath in oxygen and exhale C0². Trees remove air pollution and lower temperatures through respiration by retaining carbon and other particulates.

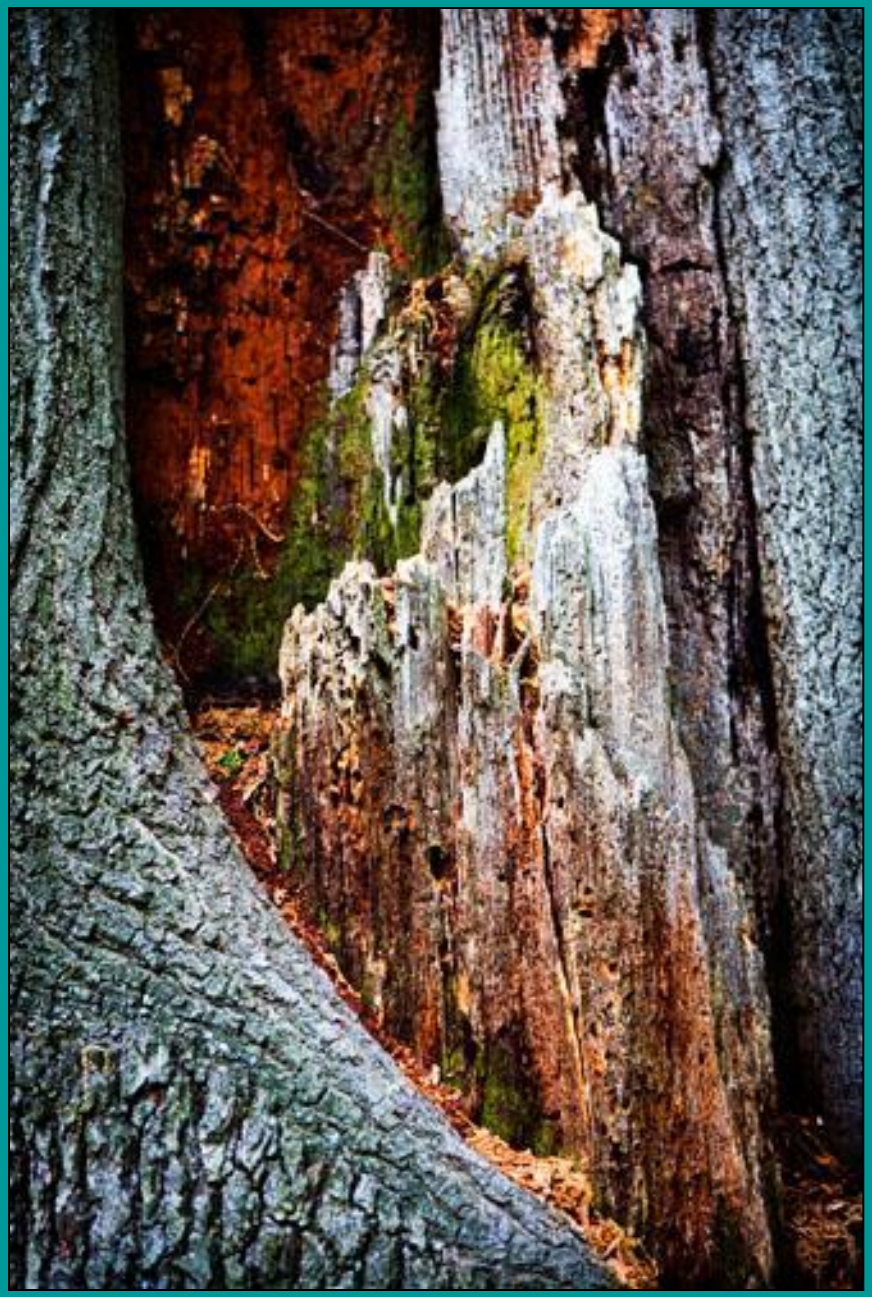


Trees make a world of difference.

More trees to conserve energy.

Cities without trees are heat islands. 100 million additional trees in our cities would save 2 billion dollars in energy costs each year.





As the tree releases nutrients back into the soil, future generations will be able to put it to good use completing the cycle of life.

Woods resistant to decay

Mesquite Cedar Chestnut
Juniper Redwood Oak
Osage orange Black walnut

Become part of the solution!

Reduce your carbon footprint!


The End
Take care of trees