



WHAT'S EATING THE TREES?

2007-2008

Bear Mountain, Brush Creek/Hayden Ranger District, Medicine Bow National Forest

Beetle Epidemics

Beetle epidemics across the western United States are becoming more obvious every season with entire landscapes turning red and brown as trees die. The epidemics also affect Canada and Alaska where tens of millions of acres of trees are dead from beetle infestations.

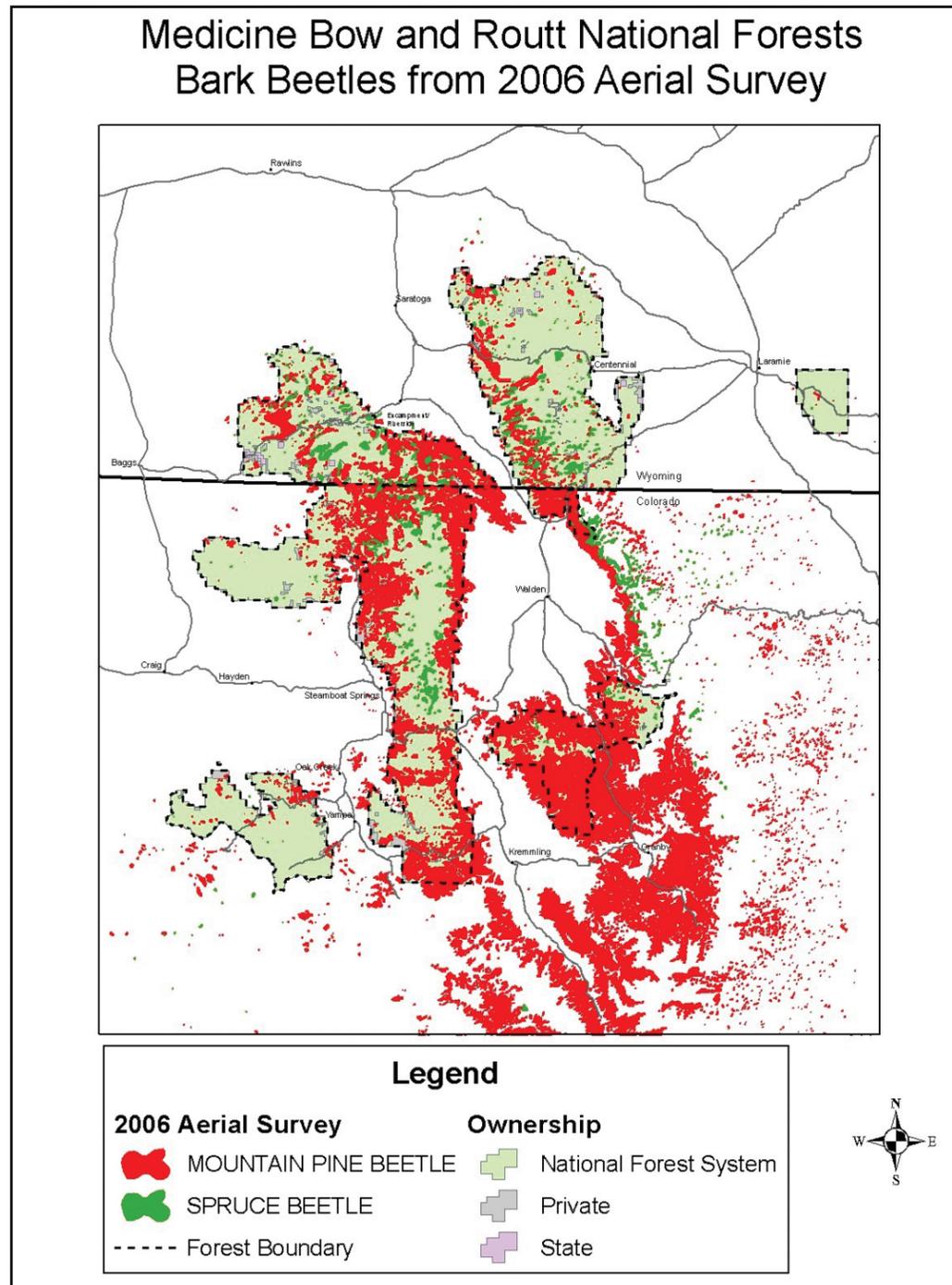
Bark beetle infestations are cyclical, with small epidemics occurring every 10 to 30 years. However, mountain pine beetle infestations of the current magnitude have not occurred in the forests in southern Wyoming in recorded history. The beetle epidemics, triggered by extended drought in aging forests, are becoming more intense at an alarming rate, and there is little that can be done to stop them. Actions can be taken to protect high-value areas such as ski areas, developed campgrounds and

trees in people's yard. Once the beetle epidemics are this large and severe, silviculture techniques are less effective.

On the Medicine Bow National Forest alone, aerial flights in 2006 identified about 94,000 acres of forests dying from beetle epidemics. This number continues to increase. Beetles are always present in mature forests. They are one of nature's ways of renewing forests. During an epidemic stage, there are millions of beetles killing millions of acres of mature trees. The beetles kill the mature trees and leave the young trees, which become the next forest. This natural cycle has likely been occurring for eons. Other insects that kill trees include Ips beetle, spruce beetle, western balsam bark beetle and Douglas fir beetle.

Beetle Facts

- ◊ Bark beetles are always present in the forest in low numbers. The beetles eat the trees inner bark, interrupting the transport of water and nutrients which eventually kills the tree.
- ◊ Beetle epidemics are cyclic and have been occurring in forests for eons. The current lodgepole pine beetle epidemic was triggered by an extended drought which weakened trees, allowing beetles to successfully attack and kill large numbers of trees, and multiply rapidly across the Western United States.
- ◊ Under normal conditions the beetles cause periodic, low amounts of single tree and small group mortality of what are typically the unhealthiest trees in the stand. Endemic beetle populations are naturally regulated through cold winter temperatures and through predation by birds—such as woodpeckers, small mammals and other insects.
- ◊ The use of commercial timber sales and tree harvests are effective and economical tools that suppress beetle epidemics on a small scale.



Why so many beetles?

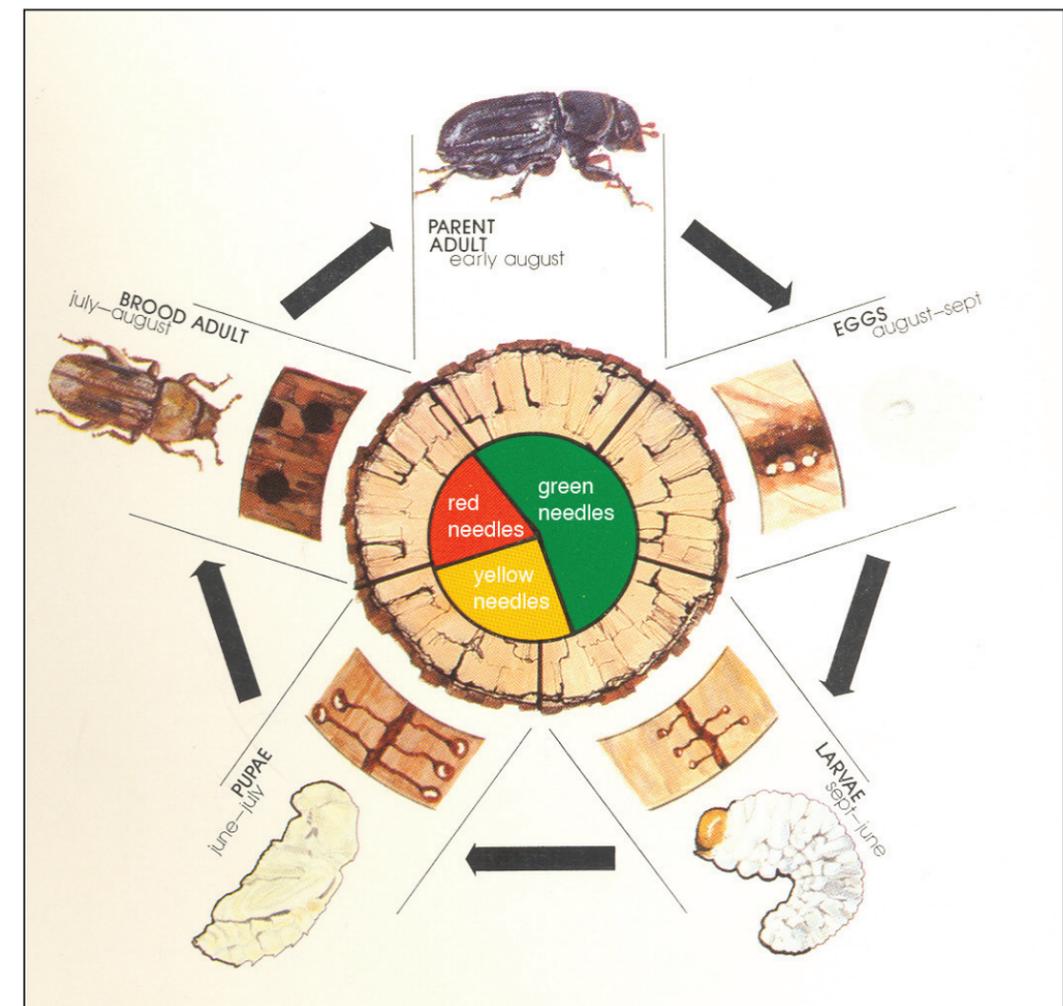
There are two major contributing factors that triggered beetle epidemics in the west.

1. Aging forests.

Regional forests are nearing the end of their natural life cycle. Old trees are weak and usually more susceptible to insects and diseases. Lodgepole pine in particular is a relatively short lived species that normally regenerates through a stand replacing event such as fire and/or insect epidemic.

2. Extended drought.

Just like a person who isn't getting enough water, a dehydrated tree is weak and unable to defend itself against beetle attacks. A young healthy tree is often able to produce enough resin to pitch beetles out of the tree.



Life cycle of the Mountain Pine Beetle in relation to the color of tree needles during the life cycle.



The Life of a Forest

On a landscape-scale, the duration and extent of a beetle epidemic cannot be predicted. Not all impacts will be negative. Potentially positive results will be the natural thinning of some stands, improved watershed yield, improved wildlife habitat, and enhanced biological diversity. Trees reproduce and die throughout the life of the forest; in this event, though, the process of trees dying is far more apparent. Even under the worst circumstances that can be envisioned, there will still be a forest; it just may not soon resemble the forest with which we are now familiar.

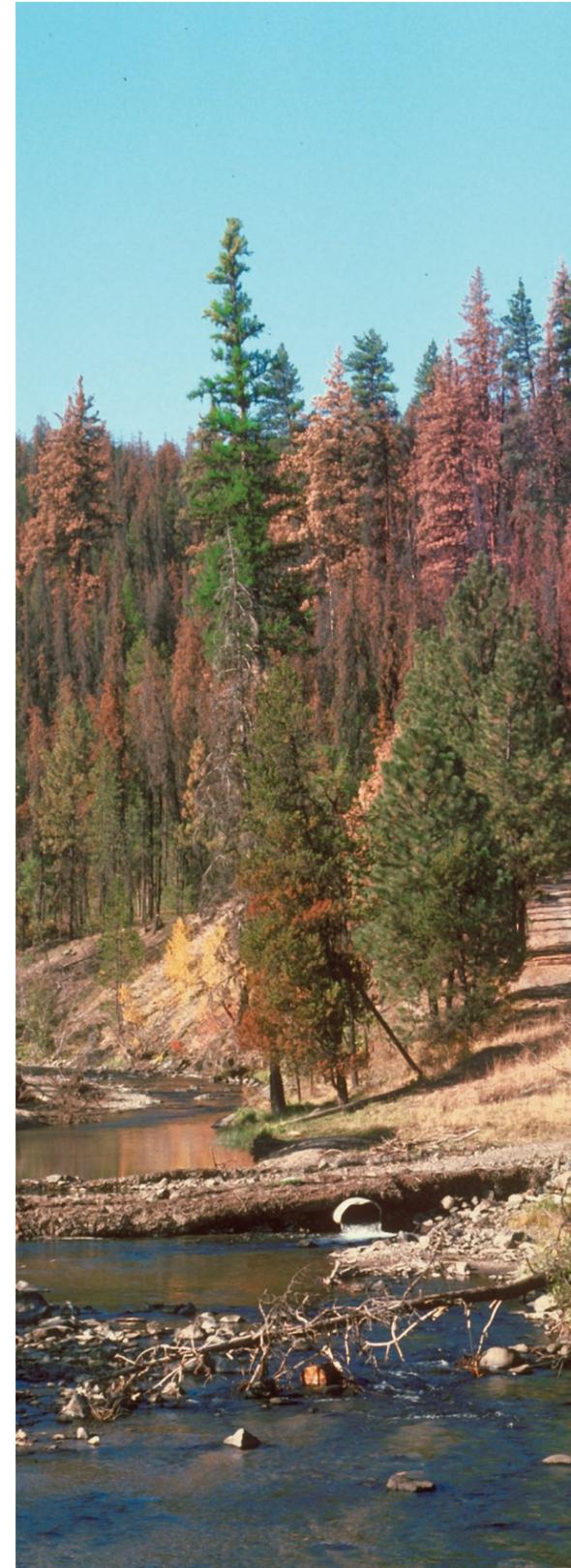
The Life of a Bark Beetle

The mountain pine beetle is about the size of a grain of rice. It has a one-year life-cycle in Wyoming. In summer, adults leave the dead, yellow to red-needled trees in which they developed. The beetles seek out living, green trees that they attack by tunneling under the bark. Usually, a mass of beetles attack a single tree. If the tree cannot resist the attack by pitching the beetles out, the beetles mate, form a vertical tunnel (egg gallery) under the bark and produce about 75 eggs. The eggs hatch, become larvae and continue to eat the inner bark of the tree. The Larvae spend the winter under the bark and transform into pupae in June and July. These new adults emerge from the tree during July and August, and attack and kill many more trees during epidemic cycles. Each infested tree typically hosts enough beetles to infest three to five additional trees.



Beetle Factoid

It would take temperatures colder than -35 degrees Fahrenheit for several days, without snow cover, to freeze bark beetles. Their bodies produce ethylene glycol (anti-freeze) in the winter.



Hastening Death

Pine beetles carry a fungus on their body and legs. Once they enter the tree, the fungus multiplies and spreads. This bluestain fungus blocks the transport of water up the tree's trunk and hastens tree death.

Red is Dead

Tree needles remain green for 8 to 10 months after the tree has been killed by beetles. Tree needles turn red or reddish brown eight to ten months after the tree has been attacked by bark beetles. Then the needles fall off leaving a gray skeleton of the tree. The trees eventually fall down.

Fire Potential

The increase in dead and downed timber will increase the risk of wildfire and increase the safety concerns of suppressing those fires. Communities across the west are working to remove these hazardous fuels from populated areas. Efforts are underway in many states to use the dead trees for biomass generators, wood pellets and lumber.

Infested Trees

In this decade, miles and miles of red, dead trees can be seen.

In forests with green trees, beetle activity can be identified by popcorn size 'pitch tubes' dotting the bark of trees. There may be a few dead beetles in the pitch tubes, but during an epidemic, most of the beetles are successful in their attack on the tree. Fine sawdust, or frass, may also be seen at the base of the tree trunk.



What Can Be Done?

The Forest Service has recognized the significance of the bark beetle epidemic and is prioritizing treatment areas. The agency is also working with members of Congress on legislation and attempting to secure needed funding to produce timber harvest, salvage, and treat high-value areas and protect communities.

Many timber sales are currently in various stages of implementation on the Medicine Bow National Forest, including Singer Peak, Holroyd, Ryan Park North and South, French Creek, Jack Creek III, Blackhall/McAnulty, Conical Peak, Overlook, Box Canyon, Battle Hazardous Fuels, White Rock Estates, Cottonwood Rim, the Ryan Park fuelwood sale, Fox Park, Rainbow Valley and Devils Gate. Other large projects are currently in the planning stages, including Soldier Summit, Bow River, Battle Mountain, Wold-WyColo, Shellrock, Foxborough, and the Savery analysis. In addition, the Forest is implementing many large-scale projects just to the south in Northern Colorado.

On a small scale, there are some tactics for mitigating beetle impacts.

- Suppression is direct action against beetle populations, killing or removing them.
- Protection of trees in an area involves the use of chemicals and/or pheromones that attract or repel beetles.
- Prevention involves using silvicultural techniques that modify the habitat over the long term so that forests are less susceptible to bark beetle mortality.



Fifty years ago, the United States Forest Service mobilized thousands of men and millions of dollars of equipment to fight the beetle invasion that began in the Flattops area of the Routt National Forest in Colorado. The effort included attempting to spray nearly every infested tree in the forest.

Technology's limits at the time led to the use of man-packed, five gallon tanks with hand-pumps. They mixed fuel oil and insecticide, including pesticides that are now banned.

We know now that to protect a mature tree requires spraying as high as 45 feet up the tree trunk. DDT and other dangerous pesticides are no longer in use due to damage to the environment. Spraying fuel oil all over a forest would horrify most people.

All that work didn't stop the beetle infestation. Cold weather in 1952 finally did.



Beetles on your property?

If you have beetle-kill trees on your property, you should consider removing dead trees around your home and outbuildings to reduce fire danger. Visit www.firewise.org for information about creating defensible space or contact your local fire protection organization or the Wyoming State Forestry Division for advice. Contact information is at <http://slf-web.state.wy.us/forestry.aspx>

Firewood may have beetles

Be careful bringing firewood home as it may contain beetles. Standing, completely dead trees probably will not still have beetles in them. To be sure, peel some of the bark back. If there are no living beetles or larvae just under the bark, the tree is safe. If there are beetles, you can peel the bark off of the trees to remove them. Peeling is typically done with a cylindrical, bladed attachment for a chainsaw. The entire felled tree should be peeled to remove beetles.



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