

Our Future Forests

~ 2008 guide for the landowner ~



A Letter to Landowners

Thank you for taking the time to read the second edition of *Our Future Forests*. This publication provides current information on mountain pine beetle and other forest health issues and provides landowners options and information about managing forests. A complex combination of drought, climate changes, older dense forests and insect and disease may be the underlying reasons to this level of change to our landscape.

There is no doubt that our forests are changing. The red hillsides of lodgepole pine killed by the mountain pine beetle are the most dramatic and visible evidence of this.

Other forest health issues are affecting our forests. Spruce beetle, ips bark beetle, aspen decline and fir-decline are among some of the forest health issues that foresters, land managers and landowners are facing. There is there is a sense of loss from these damaging agents and to most folks we have lost our forests forever. However, there is hope! Among these dead and dying forests the next forest has begun. Although we may not see our forests as they once were, we as land managers and landowners have the responsibility to help manage, protect and rejuvenate our forests for the future.

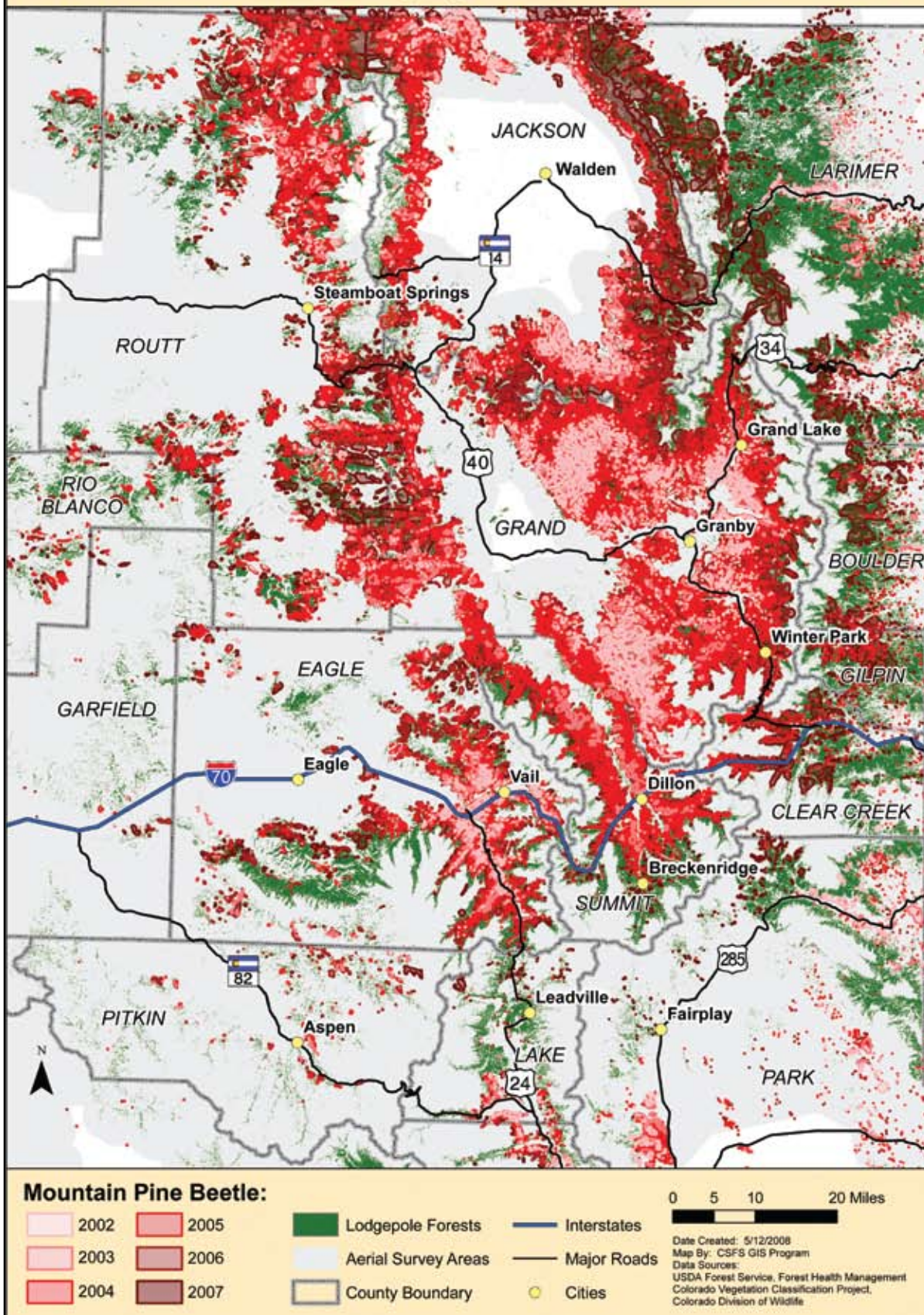
As professional foresters, we at the Society of American Foresters (SAF) see these times as both challenging and as opportunities to help YOU manage YOUR forests today and tomorrow.

In the short term, we have the responsibility to protect our homes, properties and human life by participating in forest management whether it is creating defensible space, removing fuels, supporting utilization of blue-stain wood products, and replanting and revegetation. In the long term, we must become land stewards and actively promote sustainable forest management for healthy diverse Colorado forests for generations to come. We hope you find these articles informative and useful in helping you manage your forests and lands in the aftermath of the devastation these natural forest agents can leave behind. We encourage you to participate in forest management however you can and to work with a professional forester to help you manage your lands.

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Mountain Pine Beetle - Northern Colorado Infestation in Lodgepole Pine 2002 - 2007



Due to the nature of aerial surveys, the data on these maps will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. The data presented on these maps should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and casual agent.

**IN 2007
OVER 980,000
ACRES AFFECTED BY
BEETLES IN
COLORADO**



Why Are So Many Trees Dying?

Beetle epidemics across the western United States are becoming more obvious every season with entire landscapes turning red and brown as trees die.

In northwest Colorado the beetle epidemics, triggered by extended drought in aging forests, are intensifying 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 yards.

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 in combination with girdling by the larvae hastens tree death.

Red is Dead

Tree needles remain green for almost a year 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 tree eventually falls down.

Infested Trees

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

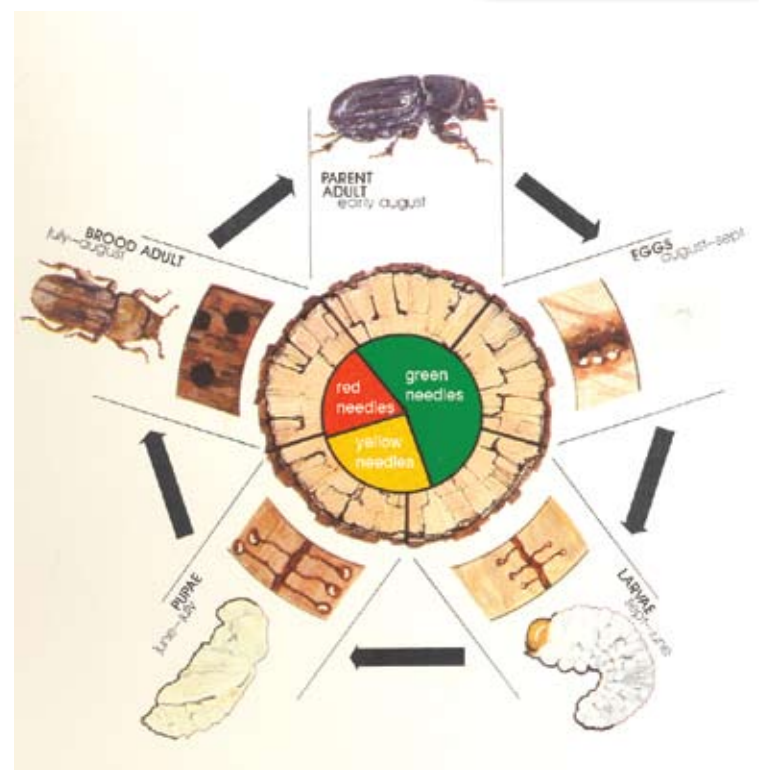
ests with green trees, beetle activity can be identified by popcorn size "pitch tubes" dotting the bark of trees. There may be a few dead beetles in the pitch tubes, but during an epidemic, most of the beetles are successful in their attack on the tree. Fine sawdust, or frass, may also be seen at the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



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.

For more information, please contact Colorado State Forest Service: 970.879.0475 or 970.887.3121 or 970.248.7325 or on the web at csfs.colostate.edu.



Life cycle of the mountain pine beetle in relation to the color of tree needles during the life cycle.

Changing Forests Affect Recreation

The changing forests may affect how and where you recreate. As trees die, their root systems will weaken and fail. We call these “hazard” trees. As agencies implement vegetation management plans in our more developed recreation areas, hazard tree identification and removal is part of normal safety operations in these areas before we allow the public into areas such as campgrounds, day use areas and parking where fees are charged. Other high use areas may be specific trailheads or other areas where a high dispersed use is occurring.

In normal years, a Ranger District will remove approximately 20 – 30 trees per campground or developed recreation area. The current mountain pine beetle epidemic is forcing us to remove up to 1000+ trees in some campgrounds. While this is a dramatic comparison, the beetle

Many ski areas are also being affected by the mortality of lodgepole pine. Similarly to Forest Service developed areas, ski areas are responding with the US Forest Service to reduce the hazards of falling trees to the public. Spraying high value trees is occurring, as well as hazard tree removal. The following are examples:

Steamboat Ski Area – In 2007, 443 lodgepole pine trees were sprayed with carbaryl to protect from the MPB. The Steamboat Ski and Resort Corporation (SSRC) is working with the USFS to update its vegetation management plan to address changes in the forest resulting from the current MPB epidemic. Trail and maintenance crews are also cutting trees near lift lines and

along trails to limit exposure to the public. SSRC and the USFS worked very successfully to limit damage (impacts) on the ski area from spruce bark beetle infestations resulting from the Routt Divide Blowdown of 1997.

Winter Park Ski Area - Since 2004, Winter Park Resort has treated more than 95 acres. This includes cutting and peeling, removal by helicopter as well as preventive spraying of 20 acres in high value areas. The ski area operates within an area covering 3,975 acres of which 1,000 acres is considered mature lodgepole pine. 90% of the mature lodgepole is infected by the mountain pine beetle. Winter Park Resort has spent an estimated \$700,000 since 2004 to curb the effects of mountain pine beetle. This year Winter Park is treating over 80 acres of individual tree islands impacted by the mountain pine beetle.

Vail Ski Areas - Vail Resorts (Vail, Beaver Creek, Keystone, and Breckenridge ski areas) is currently addressing the mountain pine beetle issue by removing hazard trees and doing limited preventive spraying on high-value trees throughout the ski areas. The USFS is working in partnership with the Vail Resorts on a long-term vegetation management plan which includes assessing and



Beetle tree removal at Steamboat Ski Area

re-establishing vegetation in sites specifically affected by the mountain pine beetle epidemic.

Copper Mountain Ski Area - Copper has removed and disposed of infested trees the past two seasons. During the summer of 2007, 350 trees in the Eagle lift pod were sprayed to protect high-value visual, wind break and watershed areas.

Aspen Ski Areas - Aspen Mountain, Aspen Highlands, Buttermilk and Snowmass ski areas are currently not seeing much beetle activity but that may change as the beetle infestation expands. Aspen will actively address the issue at that time.

While efforts to safeguard the more developed areas on the National Forests and other public places are significant, outside of these developed areas the risks associated with hazard trees is still very real. As you engage in recreation in forested areas you need to be aware of your surroundings. Look up and around where you are. Evidence of other trees recently fallen to the ground indicate that more may be coming down soon. Consider weather conditions, heavy winds and thunderstorms that tend to have strong downdrafts can induce windthrow. Contact your local offices to get the most current information about your destination.

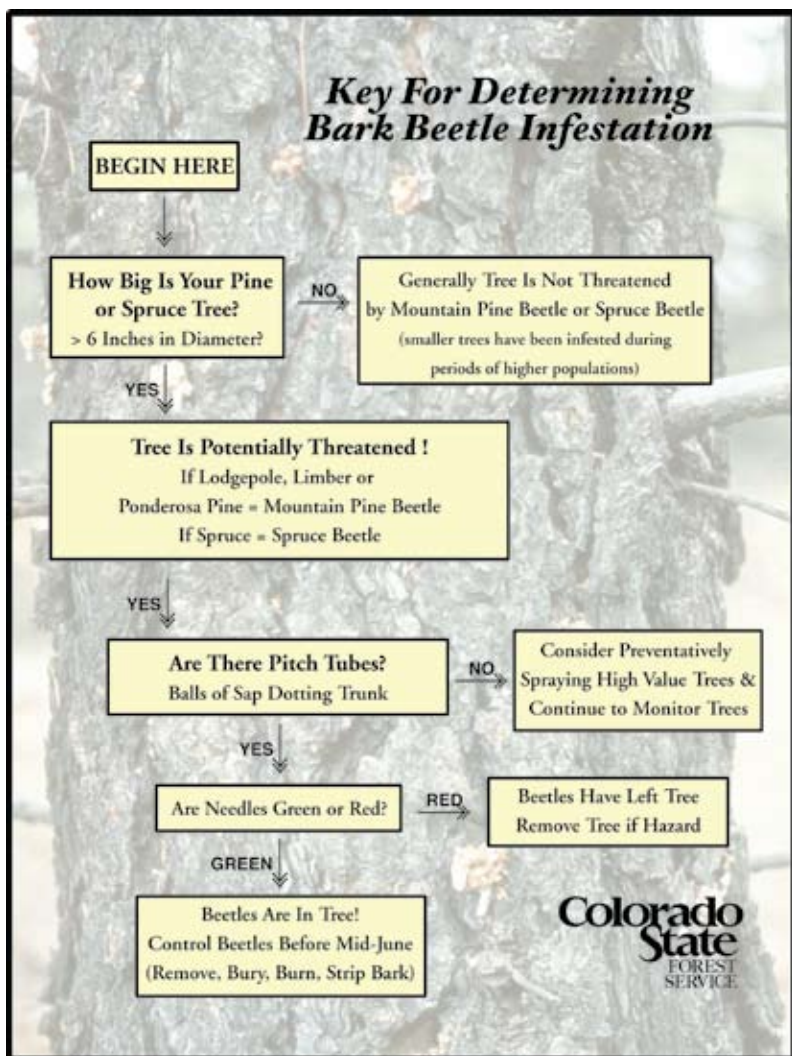


Beetle tree removal in campground. Sulphur RD



Beetle killed trees in Hinman Park CG, Hahn's Peak RD

mortality may be limiting some campground and developed areas from opening. We all want to open our facilities as quickly as we can, however the cost and manpower needed to accomplish this outweighs the resources available. The US Forest Service has developed several strategies to accomplish this task including the establishment of an incident management team to address the workload. This strategy is similar to response to large wildland fires. In some cases, the most efficient way to remove the hazard trees by using a timber sale or other service contract to remove the trees. This may cause some of your favorite places to be closed for a portion of, or in some cases an entire season. Please contact your local recreation provider for information. The US Forest Service information can be found at www.fs.fed.us/r2/recreation/camping.



WATCH OUT!

Falling trees are always a hazard when traveling in the forest.

Following these guidelines will help recreationists avoid risks.

- Be aware of your surroundings. Avoid dense patches of dead trees. They can fall without warning.
- Stay out of the forest when there are strong winds that could blow down trees. If you are already in the forest when the winds kick up, head to a clearing out of reach of any potential falling trees.
- Place tents and park vehicles in areas where they will not be hit if trees fall.
- When driving in remote areas of the forest, park close to a main road, rather than on a spur or one-way section. If trees fall across the road you may be trapped.
- Bring an ax or a chainsaw to remove fallen trees from roads in case you become trapped.
- Do not rely on cell phones for safety as there is no coverage in many areas of the national forest.

Medicine Bow-Routt National Forest U.S. FOREST SERVICE

Mountain Pine Beetle:

Frequently Asked Questions

What is the mountain pine beetle?

The mountain pine beetle (*Dendroctonus ponderosae* Hopkins) is a member of the bark beetle family, and is the most damaging insect pest of pine trees in western North America. The adult beetles are black and small, just 5-7 mm long, while the larvae look like small maggots under the bark.

What damage can they cause?

Mountain pine beetles mass attack and kill mature pine trees within a year. The adult beetles introduce blue-stain fungi into the tree when they attack. These fungi, along with insect feeding, kill the tree by cutting off paths for nutrients and water. Each female lays 60-80 eggs, enabling populations to grow very quickly. There are often enough insects emerging from one tree to attack and kill 15 additional trees.

If the forests are not managed while the beetle populations are low, severe damage to pine stands can result. Outbreaks can destroy thousands of acres of mature pine forest in a single year.

Where do they live?

The range of mountain pine beetle extends from Mexico to British Columbia. They breed in lodgepole, ponderosa, whitebark, limber, and white pines. The beetles prefer mature (over 80 years old), large trees. Beetles may attack younger trees, but they are usually less successful.

How far can they fly?

Most species of bark beetles are good flyers. Mountain pine beetles can potentially disperse over great distances if the winds are in their favor. The jury is out on the exact mileage these little creatures can fly. Some say up to 6 miles...some say farther.

What is their role in the environment?

In their normal habitats, beetles are stand-replacing factors. Beetle outbreaks remove the over-mature pine from the stand and allow other tree species to take over. However, with the current widespread epidemic, the mountain pine beetle has been very destructive in our forests. It may have detrimental impacts on the native fauna and flora, as well as the watersheds, soils, water quality and natural ecosystem succession.

Do they have any natural enemies?

Yes. Birds, especially woodpeckers, eat a large number of insects. In addition, while the birds feed, they remove bark and expose the remaining insects to the elements. Insect parasites, predators and fungal diseases also attack bark beetle larvae. However, during outbreaks, these organisms probably have little effect on the pine beetle population.

Will cold temperatures kill the mountain pine beetles?

As the fall temperatures drop, the larvae, under the bark, expel the water content within their bodies becoming in essence a sack of antifreeze. For winter mortality to be a factor of significance, a severe early freeze is necessary while the insects are still getting rid of the water. An early spring with warming temps and the insects taking on water again, followed by a hard freeze will also result in higher levels of mortality. Research indicates that cold weather in the middle of winter is not going to increase the mortality level.

What is blue stain?

As the MPBs attack lodgepole pine trees, they introduce fungal spores into the wood that quickly germinate and infect the sapwood. As the fungus grows, the sap flow within the tree becomes hindered. This combination of beetle infestation and fungal growth can lead to massive tree fatalities.

The introduction of fungus into the tree and its continued spread from MPB attacks results in a bluish discoloration in the timber, principally in the sapwood. This staining poses a significant problem for the wood products industry. Discoloration leads to a loss in the economic value of the tree due to a loss of marketability as consumers mistakenly equate this bluish discoloration with a defect.

What products can be produced from trees killed by MPB?

Bluestain fungi are not mold and do not cause decay or rot problems. They are harmless with to both wood products and people, and are usually dead by the time wood has left the manufacturer. With this in mind, wood that contains the blue stain fungus can be used in all of the same markets as non-stained wood with some qualifiers. Beetle-killed lodgepole pine can also be used in the fuelwood and biomass markets.

HOA Case Study: *Sanctuary Fuels Project*

Scope and Problem

The Sanctuary Subdivision encompasses 148 individual lots and approximately 48 acres of forested common area. Most of this common area is mature lodgepole pine forest.

For at least 10 years the residents have waged a battle against the mountain pine beetle by individually removing infested trees as well as preventatively spraying those immediately adjacent to homes. Fortunately the HOA recognized that this approach was no longer keeping up with the problem. With all the dead trees and the resulting fire danger, the HOA needed a new approach.

Over the winter of 2006, the HOA with the technical assistance of the CSFS, USFS, City of Steamboat Springs, and Routt County, took on the task of creating a Community Wild-Fire Protection Plan for their subdivision. The HOA took great pride and ownership in this process of identifying the potential issues threatening their property. Their CWPP was completed in the spring of 2007.

Fuels Project

Because the HOA had a completed CWPP, they were able to obtain a grant to assist them with their first priority – a shaded fuel break. This fuel break will remove infested and threatened trees while also allowing for better fire protection for the houses and safer, improved access for firefighters.

Over the summer and fall of 2007, over 500 trees were marked and removed along a 1.5 mile corridor encompassing 30 acres. The treated area also included a small amount of USFS forest land. Without the inclusion of the federal land this fuel break would not have been contiguous.

Product utilization was dynamic: The homeowners allowed a portable on-site mill where the red and dead trees were immediately milled into “D” logs and other lumber and used in projects in the Steamboat and Routt County area as well as sites in Utah, Telluride, Colorado and Jackson, Wyoming; green trees were hauled and utilized in mills; smaller diameter material was utilized for firewood; and any remaining slash was chipped and dispersed on site.



The Future is Bright

While the project is complete, annual maintenance is continuing to keep this fuel break a success. The homeowners are also continuing to preventatively spray any remaining high-value trees. Planting aspen seedlings is also occurring this year.

Because of the determination of the Sanctuary HOA in creating and implementing their CWPP, adjacent subdivisions are now collaborating with the Sanctuary HOA to expand the CWPP and move forward on new projects.

CURRENT FOREST DECLINE, WHAT NOW?

A SILVICULTURIST'S PERSPECTIVE

By: Wayne D. Shepperd, Ph.D.
U.S. Forest Service, Retired

The ancient Chinese curse “may you live in interesting times” certainly applies to the current situation in many of our western forests. Changes are occurring at a scale that is unprecedented in our limited frame of reference. Large wildfires, insect outbreaks, and as yet unexplained agents are killing many of our most valued forests. Many of us, including resource professionals, are left questioning what is happening and why. As a career silviculturist (literally “tree farmer”), I have spent my lifetime studying forest ecosystems, their response to disturbance, and how to emulate those disturbances in a positive manner to achieve desired forest conditions. I would therefore like to pose several questions in the context of the current mountain pine beetle outbreak in Colorado and Wyoming and share my perspective on what is currently happening in many forests throughout the West.

Can the current loss of forests be stopped?

Probably not. These disturbances are occurring on such a large scale that it is not realistic to expect that any resources we could muster at this point would have much overall effect. In the case of insect outbreaks, millions of acres are affected. Although techniques exist to save individual trees, it is cost

prohibitive to apply insecticides to large areas (to say nothing of the environmental consequences of doing so). Thinning and other silviculture activities can certainly reduce the susceptibility of forests under endemic insect population levels, but are not proving effective under the extreme population levels that are currently active in many areas. Nor is it likely that thinning applied in the face of an on-going epidemic would give the trees time to physiologically react to the reduced competition from their missing neighbors to resist the bugs.

The same increased tree densities and mature forest structures that make forests susceptible to insect attack also make them susceptible to wildfire. Fire is an integral part of almost all ecosystems and could (or should) never be completely stopped. Combustion is a relatively simple physical process that can be altered to reduce the risk to ourselves and those resources that we deem valuable. Finding the means to do so is quite another matter.

Is the loss of forests on this scale natural, or unprecedented?

Here, the answer depends upon your frame of reference. Such disturbances are certainly unprecedented in our limited frame of reference, but probably occurred at some time in our planet's tumultuous past. The processes that are at work are certainly natural. Mountain pine beetle and other insects that are currently attacking our forests are all native to these forest ecosystems and have attacked these forests before. The one thing that is different this time around is the magnitude of the outbreaks and the numbers of landscapes that are being affected at one time.

Forests in northern Colorado and southern Wyoming will certainly be altered for some time to come as a

result of the current mountain pine beetle outbreak. Loss of most mature lodgepole pine in these landscapes will affect the ecosystem, in both predictable and unpredictable ways. Species of plants and animals that depend upon conditions provided by mature lodgepole forests will be adversely affected, while those that benefit from open areas and younger-aged forests will thrive in the future.

Is climate change to blame?

Climatic conditions that are conducive to insects have certainly played a role in the current pandemic. Recent drought, combined with heavy stocking conditions has stressed trees, making them more vulnerable to successful insect attack. Minimum winter temperatures have been above the threshold needed to kill mountain pine beetle larvae for the past decade and have not naturally dampened insect population levels. Whether these climate conditions are a result of global warming or merely a short-term variation in climate is a matter of debate (and a moot point, I believe). In either case, insect populations have built up and the trees have died.

What did we do wrong?

Suppression of natural wildfires may have contributed to the continuity of susceptible-sized trees across multiple landscapes. However, we must remember that lodgepole pine forests burn infrequently, so even if fires had not been controlled many landscapes would still have been susceptible. Similarly, settlement-era harvest of lodgepole pine resulted in some landscapes having a uniform stocking of susceptible-sized trees. However, those harvests did not occur over the entire range of lodgepole pine in Colorado and southern Wyoming. Areas that have been clearcut in the last 50 years have mostly survived the current outbreak, but accessibility and other societal needs have made it unlikely that we could have further altered landscapes to the point of affecting the current outbreak in a substantial way. Lodgepole pine forests in western Canada have been managed much more intensively than ours, yet Mountain Pine Beetle outbreaks much larger than ours have



Aspen Decline - One Of The Many Forest Health Issues Affecting Colorado.

recently occurred there. In reality, what has occurred is most likely a natural phenomenon that wasn't our fault and no management action on our part could have prevented it.

Will the forests recover?

The answer to this question depends on what was there before the current mountain pine beetle outbreak. If the forest was pure lodgepole pine of susceptible size trees, then an entirely new forest must regenerate from seed stored in serotinous cones on dying trees. If trees do not have serotinous cones, or conditions are not right for the seeds to successfully germinate and establish, other

naturally re-establishing and where it is not. Once this is known, the need for future management activities including site preparation, planting, and density control (removal of competing trees and/or thinning of young lodgepole pine) can be evaluated. Where lodgepole pine does naturally regenerate, future management will be needed to avoid the development of a situation where most lodgepole pine forests are once again susceptible to mountain pine beetle. These activities might include thinning, early harvest of some stands before maturity, and encouragement of more species diversity in pure forests (aspen, spruce, and fir). If it is found that lodgepole pine is not re-establishing in some locations, climatic conditions in those areas need to be evaluated to determine whether it is reasonable to expect lodgepole pine to grow there before any management action is taken. It makes no sense to attempt to artificially replace a forest where it is no longer capable of growing.



The Next Forest Begins.

vegetation will occupy the site in the future. If smaller non-susceptible lodgepole pine trees are present, then those trees will survive and ultimately seed in new lodgepole pine to re-establish the forest. If other tree species are present in the forests that are not susceptible to mountain pine beetle, those trees will survive and dominate the future forest. Some lodgepole might survive and seed-in new trees, but only where sufficient sunlight is present. Therefore, lodgepole pine might disappear from some mixed species forests, or be a much smaller component that in the past.

What could we do to help?

A number of things could be done. A first priority would be to conduct intensive regeneration surveys to establish where lodgepole pine is

Is forest management a waste of time and money?

No. Judicious forest management is even more essential under today's increasingly complex natural and social environment. Everything we have learned about the relationships between forest stocking, age class structure, growth, and productivity still applies. We must, however, gain a better understanding of how the conditions under which those forests grow are shifting and how to modify future management actions to accommodate them. Natural resource professionals are no longer managing for a single resource or condition. We must somehow provide the proper mix of conditions across forested landscapes to best meet the needs of ecosystems and society. Doing so will certainly require active management of our forests.



Professional Foresters Help Maintain And Plan For The Next Healthy Forest.



Utilizing Trees Killed by Mountain Pine Beetles

By: Dr. Kurt Mackes, Colorado State University

Given the extent of the Mountain Pine Beetle epidemic and the number of dead lodgepole pine trees, the ability of land managers to remove these dead trees will be dictated by their ability to utilize them, with the resulting revenue used to help pay the extraction costs. There are several issues related to wood quality that must be considered when contemplating the use of trees killed by the mountain pine beetle. These issues include moisture content and wood checking, blue-stain, and wood deterioration.

Wood moisture content decreases rapidly as needles fade from green to dull red after the tree is killed. Within a period of months wood moisture content can drop from 85% or more to 40%. After moisture content drops below the approximately 30%, the wood begins to shrink and significant checking will begin to occur. Generally this will occur one to three years after the tree dies.

Mountain pine beetles introduce blue-stain into the tree. The onset is initiated before the wood begins to dry out and is associated with the drop in moisture content. After a tree is successfully attacked, within a year it is likely that almost 100% of the sapwood volume will be stained, which can comprise up to 50% or more of total tree volume. The heartwood is more resistant to staining.

Generally, decay is not a factor in the utilization of the wood until the tree falls over. Studies have shown that standing dead trees can remain sound for more than 5 years. Studies have found that trees will begin falling as soon as 3 years after death in thinned stands and 5 years after death in unthinned stands.

After considering wood quality issues, there is substantial potential to utilize wood from trees killed by mountain pine beetle. For instance, a variety of solid wood products are possible, including lumber and roundwood products such as posts and poles. The lumber recovery potential is significant. Generally, studies have shown that lumber sawn from beetle-killed timber exhibiting blue-stain maintains much of its physical integrity with minimal degradation. Within the first year after death, studies have shown that volume recovery for dead trees is not so different from live trees. However, there are value losses mostly due to increased handling costs, checking, and grade reduction attributed to blue-stain, although certain products such as blue-stain paneling processed from beetle-killed pine may command a premium in the market place over clear unstained wood.

There is also opportunity to utilize the dead trees for wood fiber products such as pulp, oriented strand board, and particleboard. Unfortunately, Colorado does not currently have the infrastructure required to produce these products. There are significant barriers to developing this infrastructure in Colorado; therefore it is unlikely this capability will be developed locally in the near future.

Other opportunities include utilizing woody biomass for products such as mulch, animal bedding, and energy. Given the scale of the mortality, biomass energy probably holds the most promise. Substantial markets currently exist for firewood (cordwood) and pellets. Markets are being developed for wood chips, primarily for heating facilities in communities that are located in close proximity to forestland. Given the pending liquid fuels crisis in the world, beetle-killed trees may provide a significant feedstock suitable for producing cellulosic ethanol in the future. Policy incentives such as the federal production tax credit continue to be developed, refined, and renewed aiding the development of such options.

Forest Restoration Guidelines in Ponderosa Pine on Colorado's Front Range

By: Frank C. Dennis – CSFS and Bob Sturtevant – Colorado Forest Restoration Institute

In ponderosa pine forests throughout Colorado, the need to thin dense stands in order to reduce the risk of catastrophic fires has become evident. Restoration treatments can lower fire danger while increasing the overall biological diversity and long-term health of treatment areas. Treatments that combine thinning with prescribed fire and that focus attention on a wide range of post-treatment conditions do the best job of reducing fire danger and improving forest health in the long term.

With the threat of a mountain pine beetle epidemic looming, favoring the oldest trees may be questioned as these are the typical targets for this insect. Reducing the number of trees per acre will benefit the larger trees and make them more resilient to insect attack; however, some may be killed by the beetles. When choosing which trees to maintain during a restoration thinning project, a diversity of age classes needs to be maintained. Favor the older trees, but have their replacements growing nearby.

The following are guidelines in



restoring ponderosa pine forests:

Save the oldest trees. Old, yellow-barked ponderosa pines tend to be resistant to fire and often provide valuable wildlife habitat and aesthetic benefits. Many of the oldest trees that remain are in declining health due to increased competition with younger trees. Restoration treatments preserve old, yellow-barked pines by cutting

mostly younger pines, lowering competitive pressures around old trees, and protecting these trees from fire. Smaller trees that are not crowding the old trees can be left as future replacements.

Reduce stocking levels.

Both thinning the trees and removing ladder fuels is generally needed to reduce crown fire potential. Reduce the number of trees to more closely resemble pre-1870 conditions, 25 to 50 or more trees per acre. Remove lower branches that can carry fire from the ground into the tops of the trees. Be sure to maintain a variety of tree ages.

Distribute trees in groups.

Ponderosa pines frequently grow in small clumps, often with interlocking crowns, which provide habitat for birds and animals that utilize tree trunks and crowns. The size, density, number, and location of such clumps profoundly affect both wildlife habitat and the future risk of crown fire. Finding a balance between the two is a vital part of planning restoration treatments.

Create openings. Historically, most openings in ponderosa pine forests were small, in the two- to five-acre range, and only a few of the very large openings were present. Re-creating such openings provides habitat for many wildlife species, and can greatly reduce the risk of crown fires.

Monitor natural regeneration.

It is important to maintain openings over time, and this is best accomplished through regular monitoring and maintenance treatments. Generally, the establishment of new trees occurs by natural seeding. If the number of new seedlings is lacking, planting can be used to achieve the desired density. If there are too many young trees in an area, some should be removed.

Keeping standing dead trees (snag retention).

Standing snags are important habitat for wildlife and birds of prey. In areas of general treatment, strive to save most standing snags, particularly those larger than 10 inches in diameter. Retention of snags within fuelbreaks,

defensible spaces, along trail and road corridors, and within recreation areas must be evaluated on an individual basis.

Avoid leaving too much fuel behind. Treatments that leave



heavy fuels behind in the form of slash or living trees won't reduce fire danger—and more treatments will be needed. Use treatments that allow the possibility of future low-severity fires to manage fuels.

Conduct prescribed burning.

Fire has played a primary role in maintaining the structure of Colorado ponderosa pine forests before these natural cycles were interrupted by Euro-American settlers. To return fire safely to its historical role in the ecosystem, prescribed burning should be used where appropriate.

Consider understory restoration.

Grasses, forbs, shrubs, and other plants comprise most of the diversity in ponderosa pine forests, and are important for wildlife food and cover and aesthetics. In addition, these understory plants provide fuel for frequent low-intensity fires that are necessary to maintain forest structure. Restoration treatments emphasize restoring the diversity and productivity of these plants.

Size and landscape patterns matter.

Larger treated areas more effectively reduce fire behavior than smaller areas. Consider working with your neighbors, subdivision and/or community to develop a restoration plan that covers numerous acres.

The closer we can restore the ponderosa pine community to its natural condition and function, the more resistant the forest will be from catastrophic wildfire and mountain pine beetle attacks.

Blue-Stain Wood Use

By Tim Reader, CSFS

Colorado has abundant markets for wood products with consumer spending totaling over 4 billion dollars on an annual basis. However, Colorado imports up to ninety-five percent of its wood products from other states and countries. With the recent increase in mountain pine beetle activity in northern and north central Colorado, private forest landowners, local communities, state and local governments, and wood products businesses have begun to explore opportunities for the manufacturing, marketing, and sales of wood products from Colorado's beetle-killed or "blue-stained" trees.

Products Where The Presence Of Blue-Stain Can Be A Positive, Value-Added Attribute

Roughsawn or Finished Wood	Outbuildings, Sheds, Barns
Wood Furniture and Accessory Items	Wood Flooring
Wood Cabinetry and Molding	Paneling
Novelty or Gift Items	

Although many consumers believe "blue-stain" wood to be an inferior product, for most applications its presence does not affect the wood or its suitability in a wide variety of uses. Blue-stain, while affecting the appearance of the wood, does not have any impact on its strength. In fact, the existence of blue-stain can be a positive attribute in many wood products. One exception is lumber graded for appearance for a specific end use. These lumber grades limit the amount of stain that can be present in order for the lumber to meet the specifications

for a specific end use, the presence of which can lower the product value. However, in most other markets, the presence of blue-stain, may not have a negative impact, and can, in fact, represent a significant "value-added" attribute for consumers purchasing wood products.

It is important to recognize the need for consumer education in overcoming some of the negative perceptions consumers may have concerning the purchase, use, and performance of wood products that may have blue-stain. There are several community and statewide efforts underway to help educate consumers of the implications of purchasing wood products from Colorado's public and private forests and local manufacturers, and the contribution this can make to improving forest health and in creating economic opportunities in our rural communities.



In Summit and Grand Counties, a locally-led effort to "Be Green, Buy Blue" has been initiated to help educate consumers about the

benefits of utilizing wood from trees killed by the mountain pine beetle, as an alternative to having it left in the forest. The Colorado State Forest Service's and Colorado Department of Agriculture's *Colorado Forest Products*™ statewide marketing effort is designed to identify Colorado grown and produced wood products from our forest health, restoration, and hazardous fuels reduction treatments. By educating consumers about the benefits of buying wood products from blue-stain trees, and having wood products manufacturers market directly to local wood products customers, Colorado's forests and wood products consumers can both benefit.

Contact your local Colorado State Forest Service District office for further information.



Blue-stained wood is caused by fungi introduced by tree-killing beetles. The naturally occurring blue/grey color does not affect the performance of the wood but catches the creative eye as it randomly follows the grain. Many products are produced from this wood including flooring, wall paneling and cabinetry.

Slash Treatment Options

By Daniel Ochocki

Retired District Forester, Colorado State Forest Service

A common dilemma faced by landowners trying to reduce their wildfire hazard by thinning pine and removing oak is, "What do I do with the slash?" Most can find neighbors who will take the larger material for use in their woodstove or fireplace, but that leaves the smaller branches and tops to dispose of. A number of options are available:



- **Piling and burning.** Though not appropriate during the fire season, this is a valid disposal method for the winter months. Wait for that first snow, when danger of flames spreading on the ground is minimal. Keep your piles small and away from trees you are trying to keep. Contact your local dispatch center and fire department before lighting.
- **Chipping.** Many rental companies and commercial fire-hazard reduction companies have chippers for rent or hire. Distributing these chips on the ground slightly increases fire danger, but remember – a ground fire is relatively easy to control. It's the fires that climb the ladder fuels into the tree crowns that present the greatest difficulty.
- **Using a grinder.** A number of grinders are available from rental companies and for hire from commercial companies. Similar to chippers, these machines leave the chips for you to spread on the forest floor or use in landscaping. Tub grinders and horizontal grinders are two different machines, but work essentially the same way and are capable of grinding stumps and larger-diameter material.
- **Lopping and scattering.** For Defensible Space Zone One (15 feet around a structure) and Zone Two (distance depends on slope but can be as great as 200 feet), removing or chipping/grinding the slash is critical.
- For the remainder of your property, however, slash generated from forest management practices can simply be cut up (lopped) and scattered. Slash should be spread as low to the ground as possible, preferably no higher than 12 inches. As years pass and snow packs this material lower to the ground, decomposition begins and nutrients are returned to the soil



Seedling Trees



The CSFS tree program enables farmers, ranchers, and rural landowners to obtain trees at nominal cost. The program's aim is to encourage landowners to plant effective windbarriers to protect buildings, cropland and feedlots, to aid erosion control, wildlife habitat, reforestation, and Christmas tree plantations.

To participate, landowners must have at least two acres of land and must agree not to use the trees for ornamental or landscaping purposes. These trees cannot be resold as living plants. Contact your local nursery for your ornamental needs.

Order forms are available in mid-October. Tree delivery is in early May. Tree ordering and delivery is done through local Soil Conservation District (SCD) offices.

If you would like to be placed on the mailing list email the CSFS or contact the local SCD:

- | | |
|-----------------------------|------------------------------|
| Routt SCD: (970) 879-3225 | Moffat SCD: (970) 824-8314 |
| Jackson SCD: (970) 723-4724 | Grand SCD: (970) 724-3456 |
| Summit SCD: (970) 724-3456 | Eagle SCD: (970) 945-5494 |
| Pitkin SCD: (970) 945-5494 | Garfield SCD: (970) 945-5494 |

Tips for Selecting, Planting, and Caring for Trees

Tree Selection:

The dividing line for a wide variety of trees appears to be at or near 7,500 ft. in Colorado. Above this elevation, consider locally native species for landscaping. A list of shrubs and trees suitable for planting at higher elevations can be found at <http://csfs.colostate.edu/allabouttrees.htm>. Other factors to consider include:

- Soil moisture and drainage.
- Exposure. Some plants perform better in the shade, others in full sun. Exposure to wind can also determine whether a tree or shrub will survive at higher elevations.
- Length of frost-free period. Some shrubs may survive at a given elevation but may not produce flowers or fruit due to a short frost-free period.

Planting & Establishment:

In mountain areas, the best time to plant trees and shrubs in spring, provided the planting stock is fully dormant. Leafed-out plants should be planted after the last frost, up until mid-August. The condition of nursery stock at planting time is important because most is grown below 6000 feet. New growth may not be hardened enough to withstand the conditions at higher elevation at planting time.

- Acclimate smaller plants by gradually exposing them to mountain conditions over a period of several days or weeks. Bring them outdoors for longer periods of time each day.
- Containerized shrubs (shrubs grown in pots) can be planted anytime from spring until late summer in order to allow some root establishment before the ground freezes.
- Use organic mulches, such as pine needles, shredded bark or wood chips, around the plant to delay freezing of the soil in the fall and to prolong root development.
- Mulch 3 to 4 inches deep over the root area to provide an effective insulation against early freezes and to help retain soil moisture. To reduce the potential for insect, disease and rodent damage, avoid applying mulch directly in contact with tree trunks and woody stems.

Other Tips:

- Most evergreens prefer full sun; some will tolerate partial shade.
- When selecting trees, consider available space, soil and site conditions, and weather factors.
- Trees have different soil moisture preferences. Group drought-tolerant types separately from those that require more moisture.
- All trees benefit from mulches. All need sufficient water to become established after transplanting.
- Most evergreens benefit from supplemental water during dry, warm or windy periods from November to March.

Contact your local arborist, nursery or forester for further assistance with types of tree species to plant in your area.



Tips For Preventive Spraying “High-Value” Trees

By Meg Halford, CSFS

Whether you choose to preventatively spray your trees yourself or hire a commercial applicator that there will be some trees that were sprayed that might get attacked. The following factors contribute to spraying failure (2-5% is the norm):

1) Misidentification of healthy trees: dry conditions and less vigorous trees contribute to less obvious “classic” signs of infestation (i.e. pitch tubes). Recent surveys show that many infested trees are not producing the obvious pitch-tube trademark that indicates that a tree is infested. Before spraying, be sure to check the entire circumference and up high on the bole of the tree for small entry holes and frass (fine sawdust) in the crevices of the bark and around the base of the tree.

2) Timing: spray treatments applied after June may run the risk of tree being attacked by early emergence attacks. To ensure treating your high-value trees before the first flight it is recommended to start your treatments in early-mid May and spraying no later than mid June. Your greatest protection will be achieved the earlier you do your treatments.

3) Improper coverage: it’s important to spray starting at the very bottom of the tree at the ground to as high as possible toward the crown (to at least 5” diameter at the top) and to spray all the way around the circumference of the tree. Any strips or patches missed will leave areas for bark beetles to attack.

4) Environmental conditions: a.) significant moisture or rain within 2 hours of application may wash off the insecticide; b.) spraying during very high temperatures may break down the chemical; c.) windy conditions will cause the chemical to drift away from the tree being sprayed and affect the amount that is intended for application.



5) Improper dosage: it’s important to make sure that the proper dosage (%) of the active ingredient for bark beetles is mixed. A greater percentage is needed for mountain pine beetle, spruce beetle etc., compared to other insects.

6) Improper mixing: it is important to maintain continuous agitation during mixing and application to assure a uniform suspension.

7) Improper volume: Lodgepole pine has “flakey” bark and may require more spray to cover the tree thoroughly.

8) Formulation: as a homeowner, if you are planning to treat your trees

without using a licensed applicator, make sure that the chemical has a legitimate label such as Carbaryl (Sevin) SL or XLR. Make sure the insecticide comes from a manufacturer that specializes in insecticides that are used for bark beetle prevention.

9) Shelf life and storage: If stored correctly, carbaryl should have a shelf life of 2 years after the manufacture date. Unused insecticide should be stored in its original container only, in cool, dry areas. Do not store in areas where temperatures frequently exceed 100 degrees Fahrenheit.

Be sure to read and follow the directions and cautions on the label of each product carefully before spraying your trees.

Remember, although some homeowners may want to try spraying their own trees, the most susceptible trees are usually too tall to be sprayed effectively by the homeowner without using high-powered and expensive equipment. It is recommended that a certified commercial applicator with training, personal protective equipment, and a high-pressure sprayer perform the treatments on your high-value trees.

For more information about preventive spraying please contact your local state forester.

Spraying Quick Reference

Chemicals Used:
carbaryl, permethrin,
bifenthrin

Spray before mid-June

Other Prevention Measures Still Questionable

Recent media attention on alternative prevention methods has created many questions for the public. One such alternative, verbenone, is available while the other, emamectin benzoate, is still being tested and not yet approved. It is important to note that these treatments are meant to be used as a part of an integrated pest management strategy and will most likely not work in the current epidemic plaguing Colorado mountains.

Verbenone is the main compound of the anti-aggregate pheromone for bark beetles. This pheromone

indicates a “no-vacancy” signal to bark beetles but DOES NOT kill the insect. Verbenone is commercially available, and registered in Colorado.

In endemic situations, this product may work well, however, in epidemic situations, it is unable to ‘mask’ the communication system of the beetle. Research has also shown mixed results on the use of these pheromones in a natural forest setting.

Emamectin Benzoate is an injectable insecticide that has been effective against emerald ash borers.

However, it still being studied and tested for its effectiveness against mountain pine beetle and spruce bark beetle in Colorado. It is not registered for use on a commercial basis.

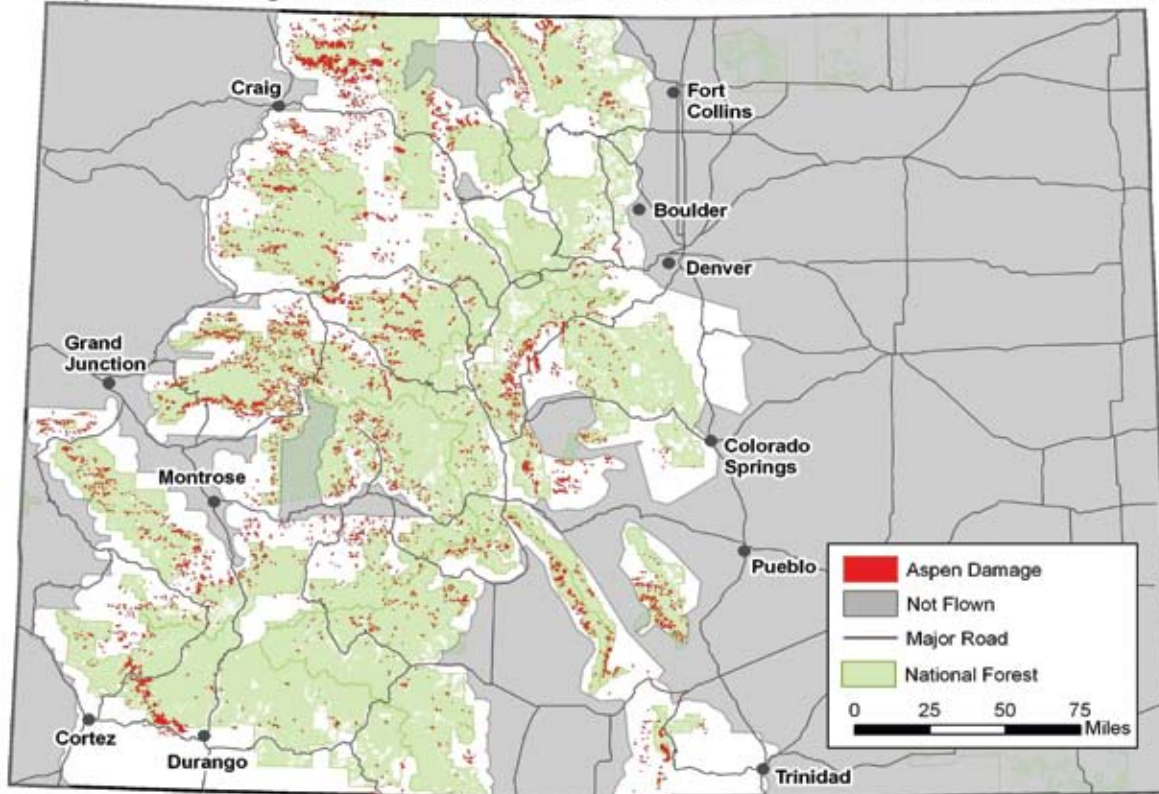
To date no research reports indicate that injecting lodgepole, ponderosa pine, or Engelmann spruce trees with any insecticide (including EB), will protect trees from bark beetle infestation.

What's Happening to the Aspens?

For the third year in a row, unexplained aspen decline occurred in western Colorado. Despite many on-site inspections, experts have not determined what is killing the trees and their root systems. Common culprits such as animal grazing and conifer encroachment are not responsible for this ongoing die-back. About 334,000 acres of aspen decline and mortality were observed from 2007 aerial survey flights. The extent of dying roots is unknown.

Researchers are currently designing an investigation that will attempt to determine specific symptoms and causes. If aspen root systems are unable to produce new aspen suckers, aspen clones that have existed for millennia will be lost. Preliminary assessments have shown many different causal agents, from decay fungi to aspen bark beetles, in different areas. In some cases, the decline is occurring on low-elevation, marginal aspen sites.

Aspen Damage in Colorado from the 2007 Aerial Detection Survey



Marssonina Blight

The *Marssonina* fungus causes this most common disease on aspen foliage. Although there is leaf discoloration, this condition usually is not damaging. Heavy infestations will cause early leaf drop.



Black Canker

This slowly developing canker is caused by the fungus *Ceratocystis fimbriata* and is easily recognized. The canker rarely kills the tree due to its slow development.



Trunk Rot

Phellinus igniarius decay fungus enters through old branch stubs or other wounds. Affected trees often are used by hole-nesting birds.



Poplar Borer

The wood-boring beetle lays eggs on the bark of the aspen. The larvae then tunnel, weakening the wood. Entry and exit holes of the beetle invite fungi, which can result in limb breakage.

Spruce Forests Are Also at Risk!

Given the risk to communities, land managers have focused strongly on the pine beetle infestation in Colorado's forests. But the spruce beetle epidemic is changing the face of Colorado's old spruce forests and may be the next large insect epidemic to transform our forests.

Recent windthrow events in southern Colorado have set the stage for increasing spruce beetle populations, which USFS and CSFS will continue to monitor.

Like mountain pine beetles in pine forests, spruce beetles are a primary change agent in spruce forests. However, some of the most recent research has researchers concerned about a trend in the spruce beetle's life cycle that has reduced its usual lifespan from two years to one. The adaptation enables the beetles to proliferate much more quickly.

Spruce beetle has the potential to impact resort economies because most of the upper reaches of the state's ski areas are in spruce forests.

The current spruce beetle infestation is widespread throughout the state and is most severe in southern and central Colorado encompassing approximately 97,000 acres in 2007 compared to 68,000 a year prior.

Proper Pinyon/Juniper Management

Quick Facts...

- Pinyon pines are well-suited to many parts of Colorado.
- They make good visual screens, windbreaks, and wildlife habitat.
- Major diseases include black stain root disease, dwarf mistletoe, armillaria root disease, and pinyon decline.
- Common insect pests are pinyon pitch mass borer, Ips beetles, pinyon tip moth, pinyon pitch nodule moth, pinyon needle scale, and pinyon spindlegall midge.
- To ensure optimum health, avoid wounding trees, choose an appropriate site, water properly, and give trees adequate space.
- Management work is best accomplished from November to March, thus minimizing insect problems.



Pinyon pines are hardy, drought-tolerant trees well-suited to many Colorado landscapes. Their dense growth habit provides good visual screening and wind protection, and they offer shelter and food for birds and other wildlife. Site selection and proper maintenance are important for tree health.

Proper Maintenance

Although pinyon pines are a hardy species, it is still important to minimize stress and wounding. They are drought-tolerant and do not grow well above 7,500 feet. To reduce stress, provide adequate space, avoid overwatering, and do not plant them in soils high in clay. Activities that can cause wounding are construction, planting, yard work and logging. If you are building on a site with established pinyons, do not locate structures within two tree heights of the tree. This is the extent of the underground root system. Proper planting of new or transplanted pinyons can minimize problems in the short and long term. Use lawnmowers and weed trimmers carefully to avoid trunk damage. Log carefully to avoid basal scarring and accidental branch removal.

In general, closely planted and overcrowded pinyons are more susceptible to insects and diseases than trees with adequate light and space. Excessive moisture in irrigated landscapes promotes succulent growth and branch cracking. These conditions provide good entry, egg laying and feeding sites for some insect species. Pruning can also create infestation sites. Allow enough time for wounds to close before adult insects are active.



View of Buffalo Mountain, Summit County 2007

Forest Health and Fuels Projects White River National Forest

By: Cary Green, U.S.F.S., White River National Forest

As the mountain pine beetle outbreak sweeps through Summit and Eagle counties, the U.S. Forest Service (USFS) is working closely with local governments, Colorado State Forest Service and other organizations to prioritize treatment needs on National Forest lands. Large-scale project planning has been completed in Summit and Eagle County over the last few years, and will continue as the USFS responds to community requests. Currently, emphasis is being directed to areas identified in each county's Community Wildfire Protection Plan (CWPP). As planning within the CWPP's is completed,

the USFS will look at areas outside of the CWPP and assess treatment needs. The USFS completed planning in Summit County that included the general areas of Frisco, Dillon, Silverthorne, Keystone and an area north of Breckenridge. Planning efforts are underway for the Lower Blue, Breckenridge, Golden Horseshoe and the Blue River areas. In Eagle County, the USFS completed planning for areas around Vail and north of Vail; and has begun planning for areas near Minturn, Tigiwan Lodge and Camp Hale.

Once the project planning is complete, treatment for affected areas can begin. Summit County has approximately 2,100 acres of fuels re-

duction and forest health treatments on National Forest lands currently under contract. In 2008, approximately 1,000 acres will be placed under contract in the Keystone area. Eagle County has approximately 1,400 acres of fuels reduction and forest health treatments on National Forest lands currently under contract. In 2008, approximately 1,650 acres of treatment are planned to be placed under contract in Eagle County.

What should the public expect?

The public should expect to see a changing landscape around communities as the USFS and its contractors reduce fuels and work to improve overall forest health. Many of the treatments prescribed will remove all of the lodgepole pine. Although this may seem like a drastic measure, this method is well-suited for lodgepole pine forest regeneration. Treatment areas will look rough at first, but should quickly recover with

forb/grass growth, as well as the next generation of trees. Similar treatments completed in the late 1980's in both counties resulted in patches of young, thriving forests that are visible today.

With the increased activity by contractors to remove the dead and dying lodgepole pine, heavy equipment and logging trucks will be a common sight in both counties. Most of the work will be completed using equipment which will cut, skid, stack and load whole trees. Some delays and road closures should be expected. Likewise, short-term closures of popular campgrounds are likely until

all the dead and hazardous trees are removed. Decisions to close campgrounds will be made on a case-by-case basis. Please call the Dillon Ranger District (970.468.5400) or the Holy Cross Ranger District (970.827.5715) for up-to-date campground closure information.



*Clockwise from left: Beetle Damage, Frisco Peninsula; Helicopter Logging in Eagle County; Mechanical Harvester in Eagle County.
Photos by Cary Green, USFS*

Community Wildfire Protection Plans What Do They Mean For You?

Community Wildfire Protection Plans, or CWPPs as they are commonly called, present one of the best opportunities to tackle the challenges facing communities situated in the Wildland Urban Interface (WUI). The process for developing these plans demands collaboration between community members, fire districts, and local, state and federal government representatives and, therefore, supports locally developed solutions. These plans are intended to be viable, usable documents that: identify and prioritize hazardous fuel reduction project areas; recommend measures to reduce ignitability of structures; determine values at risk; rank priorities for action items and; assess current levels of preparedness.

There are many benefits to communities who work through this process. The fact that these plans are developed on a landscape scale means they can include private, state and federally managed land. Communities are able to define their own WUI area and what's important to them. Federal

agencies are directed to give priority to fuel reduction projects that are tied to CWPPs and their identified values. And since, you, the community members are a main contributor to the process; you become more familiar with and have ownership in the development of your CWPP. This process serves to build local relationships and capacity for being better prepared to protect your life, home and property.

CWPPs are meant to be reviewed and updated as the identified action items and fuels treatments are completed. In this way they continue to be current plans that will be indispensable should your community ever be involved in a wildland fire. They provide valuable information to firefighters who may be called to protect your area. A key element to the success of any CWPP is defensible space. Follow the standard Firewise guidelines to mitigate your property and home. Give firefighters a safe area to make a stand against wildland fires and give your home the best chance of survivability.

Grants and agreements are available to counties and communities to help fund these planning efforts. The Colorado State Forest Service (CSFS) as well as federal agencies, have programs that help support the development and implementation of CWPPs. One web site that offers a searchable grants database, as well as other wildland related information, is: www.rockymountainwildfire.info. This web site also offers a calendar of events and training opportunities, fire management resources, media tools, featured news, and links to other wildland fire related sites. To find out more about CWPPs, call CSFS at 970.879-0475 or 970.887.3121 or 970.248.7325 or contact your local USFS or BLM office.

Most counties in northwest Colorado have completed CWPPs. Check with your local fire protection district, or homeowner's association to see if you have one for your area, or how you can be a part of developing one for your area.

Wildfire Prevention and Survival

Fire is unforgiving and can find the weak link in your home's fire protection scheme. Several factors have emerged as determinants of a home's ability to survive a wildfire, most notably the roofing material and quality of defensible space.

Defensible Space

Defensible space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the rate of spread of a wildfire toward a structure. Defensible space also helps slow the progression of a fire away from a structure to nearby homes and the surrounding forest. Effective defensible space involves developing zones around a structure, each one modified less until the natural forest is left. The first zone receives the most treatment, ideally removing all flammable vegetation within 10 feet of a structure. As you proceed farther out into the next zone, fuel is reduced thus reducing the fire intensity. This includes thinning trees and shrubs and other items illustrated in the diagram "Increase Your Home's Survivability." Once a defensible space is established annual maintenance will be required.

Landscaping

While working on your defensible space, improper landscaping can greatly increase the risk of structural damage from wildfire. When possible, utilize native species as they are generally the best plant materials for defensible space. Maintenance of grasses is critical to prevent a creeping fire from reaching the structure. Other good alternatives for landscaping are the use of ground cover plants, wildflowers, mulch and decorative rock.

FireWise Construction

Homes built in the urban interface should be built with fire resistant materials. The roofing material is the most important. Class C or better roofing materials should be utilized to prevent flying embers from easily igniting the roof. Other firewise construction techniques involve siding, enclosing eaves and overhangs and minimizing areas where heat or embers can get trapped.

Evacuation Plans

If a wildfire threatens your home you should be contacted by law enforcement when an evacuation is warranted. When evacuating, be sure to take with you important documents, mementos and medications with you. Choose a route away from the fire whenever possible. Create a critical list of items before a fire threatens.

Homeowners can do a great deal to protect and prepare their properties from the threat of wildfire.

Many fact sheets and publications are available to assist you. Contact your local fire department or Colorado State Forest Service for additional information or assistance.

To Report a Wildfire... Call 911

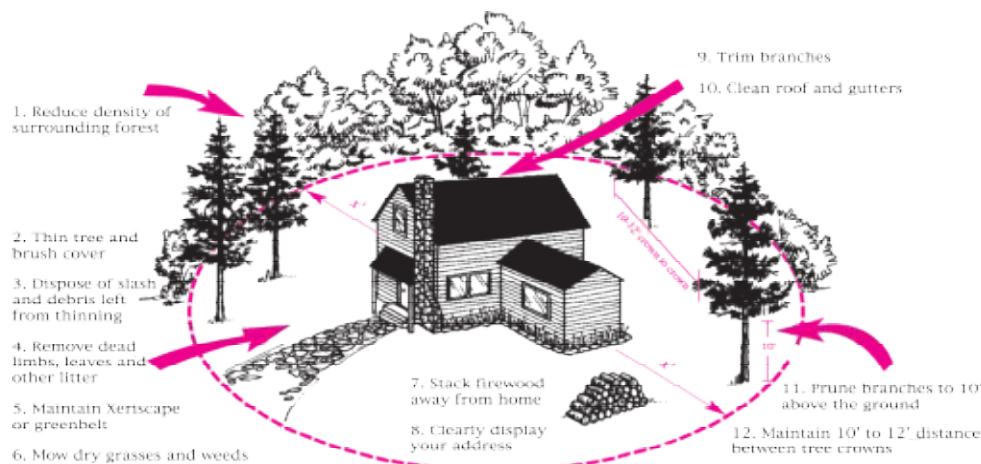
When reporting a wildfire please have the following information ready:

- The phone number you are calling from and your name.
- What is the location of the fire? Use geographic names or street address numbers.
- Who owns the property?
- What is the fire burning in? Trees, brush, grass, or other.
- What color is the smoke? White, grey, brown, blue, black, or unknown.
- How big is the fire? The size of a campfire, a house, a baseball field, etc.
- What is the weather and wind at the fire location?
- Are there any lives or values threatened? For example homes, buildings, campgrounds, structures, etc.
- How fast is the fire spreading? Fast as you can walk, run, or unknown.
- Is anyone fighting the fire? Like the Forest Service crews, fire department, neighbors, passers-by etc.



Please remember, the more information you have and the better you can answer the above types of questions, the easier it is for fire crews to quickly respond to the fire. On average, 98% of fires are contained within 24 hours of their start.

WILL YOUR HOME SURVIVE A WILDFIRE?



The above 12 actions will increase your home's chance of surviving a wildfire.

Contact Your Local Fire Department or Colorado State Forest Service For Additional Assistance

Steamboat Springs Fire Department 970.879.0700 www.steamboatfire.com	Hot Sulphur - Parshall F.P.D. 970.887.1426	Greater Eagle Fire Protection District 970.328.7244 www.eaglefiredistrict.com
North Routt Fire Protection District 970.846.4311	North Park Fire Protection District 970.723.4747	Vail Fire Department 970.479.2250 www.vailfire.com
West Routt Fire Protection District 970.276.3796	Copper Mountain F.P.D. 970.968.2300 www.coppermtnmetro.org	Aspen Fire Protection District 970.925.5532
Oak Creek Fire Protection District 970.736.8104	Lake Dillon Fire Rescue 970.513.4100 www.ldfr.org	Basalt Fire Protection District 970.704.0675
Yampa Fire Protection District 970.638.4227	Lower Blue Fire Protection District 970.724.3376	Carbondale Fire Protection District 970.963.2491
East Grand Fire Protection District 970.726.5824 www.eastgrandfire.com	Red White Blue Fire Protection District 970.453.2474 www.rwbfire.org	Glenwood Springs F.P.D. 970.384.6480
Grand Lake Fire Protection District 970.627.8428 www.grandlakefire.org	Gypsum Fire Protection District 970.524.7101	Colorado State Forest Service 970.879.0475 or 970.887.3121 or 970.248.7325 csfs.colostate.edu
Kremmling Fire Department 970.724.3795	Eagle River Fire Protection District 970.748.9665 www.erfpd.org	USDA Forest Service www.fs.fed.us/mrmf
Grand Fire Protection District 970.887.3380		

Is Your Address Visible?



In order for emergency personnel to respond efficiently to an emergency call, streets and addresses must be properly marked and visible from the road. Buildings that cannot be seen from the road should display their addresses on a 5 to 7 foot post no more than 25 feet from the road. Six inch reflective letters on a contrasting background is ideal.



Forest management work completed prior to the fire helped prevent any buildings from being burned in the Y Fire in Grand County in June 2007. Crown fires, as pictured above, can burn in crowded forests with or without beetle-killed trees.

Tips for Selecting a Contractor

- Before you look for your contractor, whether it is for tree removals or preventive spraying, make sure to identify your objectives and what your expected outcomes are. Get advice and recommendations for the forest management needed from your local land managers in your area.
- Contact local land management agencies for a contractor list (agencies can not recommend specific contractors, but can provide a list).
- Call more than one or two contractors. If possible get at least 3-5 names, preferably by recommendation and word of mouth.
- Ask for references and check them.
- Ask contractor for a portfolio and look through it. Look at work completed in the past and ask yourself if this contractor fits your needs.
- Ask contractors what kind of equipment they will be using-you may not have much knowledge of what they are telling you, but you can take that information and call your local forester and determine if the equipment they will be using is adequate or too much.
- Ask the contractors you're interested in how many people will be helping them and if this is included in the cost.
- Ask for copies of certificates of general, automobile and workmen's compensation insurance.
- If hiring a spray contractor ask for a copy of certificate for spraying applicator license.
- Remember the lowest bid given may not meet your forest management needs, time lines and expectations!

References

Firewise

www.firewise.org

Northern Colorado Bark Beetle Cooperative

www.fs.fed.us/r2/fhm/bbcoop

Colorado State University Cooperative Extension

www.ext.colostate.edu

The Bug Wood Network

www.bugwood.org

Rocky Mountain Wildfire Info

www.rockymountainwildlandfire.info

Bark Beetles of the World

www.barkbeetles.org

Routt National Forest (USDA)

www.fs.fed.us/r2/mbr

USFS Campground Information

www.fs.fed.us/r2/recreation/camping

White River National Forest (USDA)

www.fs.fed.us/r2/whiteriver

Bureau of Land Management

www.blm.gov

Colorado State Forest Service

csfs.colostate.edu

County Governments

www.colorado.gov/colorado-government/countygovs.html

Colorado State Legislature

www.leg.state.co.us

State Legislature Helps Landowners

Bills Passed in 2008

HB08-1110 - Income Tax Deduction for Wildfire Mitigation Costs

For income tax years 2009 through 2014, this bill, *as amended by the House Finance Committee*, establishes a state income tax deduction for 50 percent of a landowner's direct costs in performing wildfire mitigation measures on his property, up to the lesser of \$2,500 or the landowners federal taxable income. The amended bill specifies that in the case of a joint return, the total deduction shall not exceed \$2,500. In the case of a married couple filing separate returns, only one return may claim the deduction. The bill further specifies that the mitigation measures must be performed within Colorado wildland-urban interface areas and be authorized by a community wildfire protection plan for the landowner to claim the deduction.

HB 1269 - Sales and Use Tax Exemptions for Beetle Killed Trees

For FY 2008-09 through FY 2012-13. This reengrossed bill provides a sales and use tax exemption for sales, storage, and use of wood products, such as lumber, furniture, or wood chips that use wood from salvaged trees killed or infested by mountain pine beetles. The exemption is repealed July 1, 2014. The bill also provides cities and counties the option of exempting such sales from taxation. Wood wholesalers must certify on a Department of Revenue form that a wood product is from salvaged trees in order for the product to be tax exempt.

HB 1318- Concerning Mitigation of the Effects of the Pine Beetle Infestation

The bill creates the Beetle Mitigation Fund to be administered by the Colorado State Forest Service, an agency of Colorado State University, to mitigate beetle infestation on state-owned land. The amended bill requires the Colorado State Forest Service to maintain information on its web site regarding beetle infestation, the fund, and allowing the public to make an online donation to the fund. It also requires other interested state departments to add online links to their web sites to encourage donations.

SB 71 - Extend the Forest Restoration Pilot Program

The bill, extends the repeal date for the Forest Restoration Pilot Program and its related technical advisory panel from July 1, 2008, to July 1, 2012. The General Assembly created the Forest Restoration Pilot Program through HBO7-1130 as part of the Colorado Forest Restoration Act. It directed the Colorado State Forest Service and the Division of Forestry, Department of Natural Resources, to solicit proposals for experimental forest restoration projects that protect water supplies. It also established a technical advisory panel to assist the state forest service in the proposal selection process.

SB 221 - Watershed Bonding for Forest Health

This reengrossed bill authorizes the Colorado Water Resources and Power Development Authority (CWRPDA) to issue up to \$50 million in bonds for the purposes of funding watershed protection and forest health projects. The amended bill authorizes CWRPDA to make loans from bond proceeds for such projects to governmental agencies that have an agreement with either the Colorado Clean Energy Development Authority or the Colorado State Forest Service (CSFS). Governmental agencies includes cities, counties, water conservation and conservancy districts, special districts with at least 500,000 registered voters, municipal utilities, state agencies, the United State Forest Service and the Bureau of Land Management, and enterprises established through an interstate compact.

The bill requires such agencies to specify how the moneys should be allocated by CWRPDA through a memorandum of understanding, subject to the following restrictions on distributions up to 20% may be distributed to the Clean Energy Development Authority for watershed protection and forest health projects, and incentives for the use of beetle infested lumber; and the remainder shall be distributed to the state forester for watershed protection and forest health projects

The bill also authorizes CWRPDA to establish debt service reserve funds for such projects, to be used for the payment of the principal on bonds. These funds may include moneys appropriated by the General Assembly for such funds; and derived from bond sales; and made available from other sources.

Finally, the amended bill requires the CSFS to collaborate with federal, state, and local water providers to recommend the use of available resources for high priority areas and projects on state and federal lands that serve as the primary source of water for communities and municipalities. Consideration must be given to the effective use of available resources by: applying the principles of the Colorado Good Neighbor Authority program; combining resources with any available federal grant money; and, partnering with land management agencies with jurisdiction for community and municipal watersheds.

