

TESTIMONY OF HERBERT C. FROST, ASSOCIATE DIRECTOR, NATURAL RESOURCE STEWARDSHIP AND SCIENCE, NATIONAL PARK SERVICE, DEPARTMENT OF THE INTERIOR, BEFORE THE HOUSE NATURAL RESOURCES COMMITTEE, SUBCOMMITTEE ON WATER AND POWER AND SUBCOMMITTEE ON NATIONAL PARKS, FORESTS, AND PUBLIC LANDS REGARDING MOUNTAIN PINE BEETLES: STRATEGIES FOR PROTECTING THE WEST.

JUNE 16, 2009

Chairwoman Napolitano, Chairman Grijalva, and members of the subcommittees, thank you for the opportunity to appear before you today to discuss mountain pine beetles and the devastating impacts to our western pine forests.

I am Dr. Herbert C. Frost, Associate Director for Science and Stewardship in the National Park Service. I am joined today by representatives of other bureaus within the Department of the Interior who share in the management of public lands affected by the mountain pine beetle, including the Bureau of Land Management, the Bureau of Indian Affairs, and the U.S. Fish and Wildlife Service.

The Department is extremely concerned about escalating mountain pine beetle populations and the associated disastrous impacts to public and private lands including the increased risk of wildfires from dead or dying trees, loss of wildlife habitat, impacts to natural and cultural resources, and threats to surrounding communities. This spread, and the related impacts that are currently being experienced, are at epidemic proportions throughout the west, and appear to be the result of a number of factors including natural beetle population cycles, continuous mild winters, and an abundance of uniformly mature pine forest stands.

This testimony highlights the collaborative efforts of bureaus within the Department to combat the immediate threat of the mountain pine beetle while also

promoting the long-term stewardship and sustainability of healthy, resilient forests that will be better able to endure cyclic mountain pine beetle epidemics and their potential impacts.

Background

The mountain pine beetle (*Dendroctonus ponderosae*) ranks first in destructiveness among the tree-killing bark beetles that are native to the west, although there are many native beetle species affecting a host of other pine tree species nationally. The mountain pine beetle affects numerous species of western pine, including ponderosa, lodgepole, and the five-needle white pine species. In recent years, outbreaks have increased mortality rates well above ambient levels within forestlands in the Northern and Central Rockies, in Eastern Oregon and Washington, and as far north as Canada. A current and very visible outbreak is affecting virtually all mature lodgepole pine in Colorado, along with large areas of lodgepole and limber pine in Wyoming. Affected lodgepole pine trees are as young as sixty years old and as small as six inches in diameter at breast height. Tree mortality from this outbreak is estimated to have now occurred on nearly 8 million acres nationwide.¹

Bark beetles infest pine trees by laying eggs under the bark. When the eggs hatch, the larvae mine the area beneath the bark and eventually cut off the tree's supply of nutrients. The beetles also carry a fungus that causes dehydration and inhibits a tree's natural defenses against beetle attacks.

Under typical conditions, bark beetles play an important role in forest ecosystems, providing for periodic forest renewal. Periodic outbreaks help shape our forested

¹ USDA-APHIS. 2008; Western Forestry Leadership Coalition, 2009.

landscapes, resulting in forest succession. The dead trees also provide critical habitat for birds, bats, and other cavity-dependent species.²

Although mountain pine beetle outbreaks and associated pine tree die-offs are a natural cyclic phenomenon, the current outbreak is epidemic due to several variables.³ One variable is that the northern part of the beetle's geographic range has expanded to include high-elevation areas that historically were too cold for the beetle to survive during the winter months. These high elevation pine stands, such as the five-needle pines, do not have an historic evolutionary relationship with the beetles and hence, the beetles act in similar ways to an invasive species. This range expansion may be the result of reoccurring drought and climate change, which contribute to warming trends in mountain ecosystems.⁴ Another variable is that certain species throughout our western forests have been impacted by years of fire suppression efforts, aimed at protecting critical infrastructure and developed areas.⁵

When trees are killed by the beetle, the resulting impacts are significant. Dead trees produce additional fuel for wildfires that can lead to the destruction of large numbers of natural and cultural resources including tribal values on Indian reservations, archeological sites in park units, and economically valuable timber. Large-scale fires can also destroy high-value resources such as campgrounds and visitor facilities, and can

² Shrimpton, D.M. 1994. A report for Forest Health. DC Ministry of Forests, December 1994; Davis and Johnson. 1987. Forest Management 3rd Edition, McGraw Hill; Bentz, et.al. (2005) Bark Beetle Outbreaks in Western North America: Causes and Consequences, Bark Beetle Symposium, Snowbird, Utah.

³ USDA-APHIS. 2008; Western Forestry Leadership Coalition, 2009.

⁴ Logan J.A.; Powell J.A. 2001. Ghost Forests, Global Warming, and the Mountain Pine Beetle (Coleoptera: Scolytidae). American Entomologist. 160-172; Kurz, W.A. et al. Mountain Pine Beetle and Forest Carbon Feedback to Climate Change; Campbell, Elizabeth M. 2007. Climate change, mountain pine beetle, and the decline of whitebark pine, a keystone species of high-elevation ecosystems in British Columbia, Canada. Ecological Society of America meeting, August 2007, San Jose, CA.

⁵ Davis and Johnson. 1987. Forest Management 3rd Edition, McGraw Hill.

quickly spread from our public lands to surrounding communities, causing death and destruction of property. High severity fires can also result in ground surface heating and consequential increased erosion in some watersheds.

Mortality of these tree stands also negatively impacts wildlife. Pine forests offer critical habitat for many wildlife species, providing vital sources for food, protection, and breeding sites. For example, white bark pine produce seeds that are a major source of food for federally listed grizzly bears in the late summer and early fall.⁶

No effective treatment for suppression of large-scale pine beetle outbreaks currently exists, but many bureaus within the Department are approaching this problem in a variety of ways based upon their individual missions, policies, laws, and management mandates under which they operate.

National Park Service

Although there are no current estimates of the potential acres involved, approximately 40% of National Park Service (NPS) lands in the west are forested and a significant percentage of those lands are occupied by vulnerable species. The NPS is approaching this problem by mapping the outbreaks of mountain pine beetles within its park units, which at this time is now occurring in all western states except North Dakota; areas of California, the front range of Colorado, the Black Hills of South Dakota, and the

⁶ Felicetti, L.A., C.C. Schwartz, R.O. Rye, M.A. Haroldson, K.A. Gunther, D.L. Phillips, and C.T. Robbins. 2003. Use of sulfur and nitrogen stable isotopes to determine the importance of whitebark pine nuts to Yellowstone grizzly bears. *Canadian Journal of Zoology* 81:763–770; Lanner, R.M., and B.K. Gilbert. 1994. Nutritive value of whitebark pine seeds, and the questions of their variable dormancy. U.S. Forest Service General Technical Report INT-GTR-309. pp. 206–211; Mattson, D.J., B.M. Blanchard, and R.R. Knight. 1992. Yellowstone grizzly bear mortality, human habituation and whitebark pine seed crops. *Journal of Wildlife Management* 56:432–442; Robbins, Charles T.; Schwartz, Charles C.; Gunther, Kerry A.; Servheen, Chris. 2006. Grizzly Bear Nutrition and Ecology: Studies in Yellowstone National Park. *Yellowstone Science*, Volume 14, Number 3, pg. 19-26.

North Cascades are particularly hard hit. Within these states, 57 national park units have reported elevated populations of beetle infestations. An additional 21 units are within the affected area but have not yet reported increased beetle activity.

Outbreaks in the 1970's – 1980's contributed to the historic Yellowstone fires of 1988, the largest wildfire in the history of the park, which destroyed over 793,000 acres. At that time, dense, 90+ year old stands of lodgepole pine were further stressed by several years of drought, adding to the vulnerability of these trees and leading to thousands of acres of beetle-killed lodgepole in the park. These beetles are now again playing a role in changing ecosystems within the greater Yellowstone area, including Grand Teton and Yellowstone National Parks.

NPS is also responding to escalating mountain pine beetles epidemic by providing for visitor safety, minimizing fire danger to visitors and neighboring communities, protecting dependent wildlife species and habitats, and providing for long-term sustained healthy forest ecosystems. In campgrounds, visitor centers, and other high-use areas, a combination of actions are being employed to ensure these goals and objectives are met with highly susceptible trees and problem trees being removed. These actions are helping to manage existing infestations and protect vulnerable areas. In some parks, targeted insecticides are being used to save high-value trees.

Specifically with respect to Rocky Mountain National Park in Colorado, mountain pine beetles are rapidly expanding with mortality in lodgepole pine approaching nearly 100%. Beetle outbreaks in the park represent only a small portion of the Colorado forests that are a part of this current outbreak. Response to the potential fire and watershed consequences of this outbreak are being coordinated through an interagency task group

that includes federal, state, and 22 counties. The goals of the plan at Rocky Mountain National Park are consistent with the task force recommendations: to remove or protect high-value resources in or near park facilities, such as campgrounds, housing areas, and visitor centers. The plan identified more than 350 locations in the park where life and property are at risk. Current projections indicate that the park will need to remove more than one million hazard trees, costing more than \$7 million dollars during the upcoming years. In areas where heavy tree mortality is occurring adjacent to towns and communities, fire reduction treatments are planned.

Even with the aggressive plan at Rocky Mountain National Park, approximately 95% of the park lands will not be treated. Unlike other agencies, commercial timber sales are not authorized on NPS lands. Consequently, much of beetle-killed trees will remain standing. In accordance with our the Organic Act and our *National Park Service Management Policies*, NPS allows natural recovery of areas following disturbances, such as fires, unless additional action is needed to protect cultural and historic resources, protect park developments, or to ensure human safety.

Bureau of Land Management

The Bureau of Land Management (BLM) estimates that up to 800,000 acres of BLM-managed forestland in Colorado, Wyoming, Montana, and Idaho are infested by the mountain pine beetle. Warm winters, drought stress, and a prevalence of over-mature, over-stocked, even-aged, single species forests present ideal conditions for such a severe outbreak. The unhealthy condition of the forest makes it susceptible to fatal insect attack.

Harmful impacts to BLM lands are numerous. Increased tree mortality leads to increased fire hazards, degraded conditions for wildlife, negative effects on wood products industries, and declining tourism. In some areas of high tree mortality, fire suppression will be difficult and dangerous.

BLM is approaching this epidemic by treating, in fiscal year 2009, 9,500 acres to mitigate impacts of the mountain pine beetle outbreak. The treatments are focused on protecting high-value recreation sites through placement of pheromone traps to prevent tree mortality, and reducing the risk of catastrophic wildfire events by reducing fuels through salvage of dead and dying trees. Some challenges to conducting treatments of additional acreage include poor markets for treatment by-products, limited inventory data, limited numbers of contractors to perform the work, steep and/or inaccessible site conditions, and time required to complete the necessary National Environmental Policy Act (NEPA) processes.

While this hearing is focused on the mountain pine beetle outbreak, there are other insects that could create similar impacts in crowded, drought-stressed forests. Creating resilient landscapes is one possible long term solution to addressing outbreaks of insect infestation. Approximately 50% of the 32 million acres of public domain forestland that BLM manages in the lower 48 States are vulnerable due to overstocking and are therefore at great risk of increased insect and disease attacks and catastrophic wildfires. To restore forest health, projects are planned to achieve the correct density, species composition, and stand structure for a given site, so that insect and disease agents will remain at endemic levels as opposed to epidemic levels now seen in pine beetles.

In fiscal year 2009, BLM is also thinning 25,000 acres to improve forest health via commercial timber sales, service contracts, and stewardship contracts.

Bureau of Indian Affairs

Some of the most devastated areas of pine stands in the west occur on reservation lands under the management of the Bureau of Indian Affairs (BIA). In the Central and Northern Cascades (Northwest Region), the Warm Springs Reservation in Oregon has experienced mortality in some of their lodgepole pine stands due to mountain pine beetles -- 69,000 acres are infested, of which 40,000 acres are completely dead. Similarly, the lodgepole pine stands have been nearly wiped out on the Yakama Reservation in Washington. In many of these areas, the beetle has run its course, with few healthy lodgepole pines left.

Tribal, agency and regional staff at these locations are concerned that the high beetle populations may significantly alter the ecosystem by effectively removing mature lodgepole pine as a component. They are also concerned that the resulting extremely high fuel hazards will create a catastrophic wildland fire risk that could not only endanger the lodgepole pine areas, but the surrounding forest and its multitude of tribal values as well.

In response to the devastation on Indian lands, BIA has assisted reservations in taking steps to protect the remaining pine stands. At the Colville Indian Reservation in Washington, 8,000 acres of lodgepole pine stands are at high-risk for mountain pine beetle infestation. The main treatment is a regeneration harvest and conversion to a

different species, mostly western larch. About 10,000 acres have been converted since the 1970's.

At the Rocky Boys Indian Reservation, the reservation has been successful in timber harvest salvaging of the mortality, but is still facing ongoing infestation. Non-commercial stands have been affected as well. On other reservations, the incompatibility between salvage operations and reservation uses, and proximity to markets are restricting large-scale salvage operations.

U.S. Fish and Wildlife Service

Mountain pine beetles are not a significant issue on lands managed by the U.S. Fish and Wildlife Service (USFWS), specifically National Wildlife Refuge System and National Fish Hatchery System lands. Very few USFWS lands have significant forested habitat and thus the Service only administers small amounts of acreage of western pine forest, most of which consists of ponderosa pine, not the mature (and over-mature) lodgepole pine that has, to date, suffered from the most intensive beetle infestation.

Leadville National Fish Hatchery (NFH) in Leadville, Colorado, is an exception. NFH lands total over 3,000 acres of timber, including 2,500 acres of mature lodgepole pine. The hatchery is near the epicenter of the severe beetle infestation in the Colorado High Country and beetle infestation is an active management issue at the hatchery. The majority of this timber is in the Mt. Massive Wilderness Area; approximately 500 acres of the hatchery's timbered areas lie outside the wilderness.

The hatchery manager first observed beetle kill on hatchery forests in 2006 and has tasked staff and volunteers to remove dead/infected individual trees on an annual

basis. Pheromone packets are applied each year to protect individual pine trees in the hatchery headquarters area, and in 2008, the Service participated in an interagency effort with the Bureau of Land Management to thin lodgepole and to encourage aspen, spruce, and fir regeneration on hatchery lands. Additional pine thinning partnership projects are planned for 2009 and beyond.

While the USFWS does not anticipate these efforts will completely prevent beetle-kill of the hatchery's lodgepole forest, the Service is hopeful the efforts will help reduce fuel loads and stimulate regeneration of other species. It remains unclear if thinning in uninfested forest stands will have any mitigating impact on mortality of mature lodgepole on USFWS or any other infested lands in Colorado.

Department Efforts

In addition to all the actions being taken by specific bureaus, the Department is coordinating several efforts including integrated pest management (IPM), creation of an incident commander for beetle control efforts in Colorado, multi-agency discussions, and blended fuels treatment plans and zones. The Department is also collaborating with the Department of Agriculture (through the U.S. Forest Service) who provides forest health information and support annually to the bureaus.

In the face of rising mountain pine beetle infestations across the west, the Department will need increasing attention and dedicated resources to face this challenge. The greatest need will be for continued mapping and monitoring, fuel treatment around high-value areas, and for careful assessment of stressors such as sustained drought,

climate change, beetle spread and impacts to the other integral flora and fauna components that make up a healthy, intact forest.

Conclusion

Mountain pine beetles will continue to be a part of the western landscape. It is an episodic pest reoccurring periodically throughout our western forests. It is currently rapidly expanding to epidemic levels in parts of the west. Some of this expansion is beyond the historic parameter for this species, in part assisted by reoccurring drought, climate change, overly dense mature forests, and changes in the biology of mountain pine beetle.

The Department is committed to continued monitoring of the mountain pine beetle as it spreads to new areas and expands its range. We will continue to coordinate and support our federal, state and local partners to address this issue. The Department is dedicated to the interagency fuels and fire suppression efforts to respond to the inevitable fires and loss of habitat that will occur as a result of this outbreak. Although stopping the mountain pine beetle is not a viable option, management strategies to control its damage in priority areas, and protect resources and communities from catastrophic wildfires are critical. The continued collaboration and support between the Departments of the Interior and Agriculture will help us to face this unprecedented forest health challenge.

This concludes my prepared testimony. I, along with our technical witnesses from the other bureaus, would be happy to answer any questions you or the other members of the subcommittees have on this topic.