

Vistas



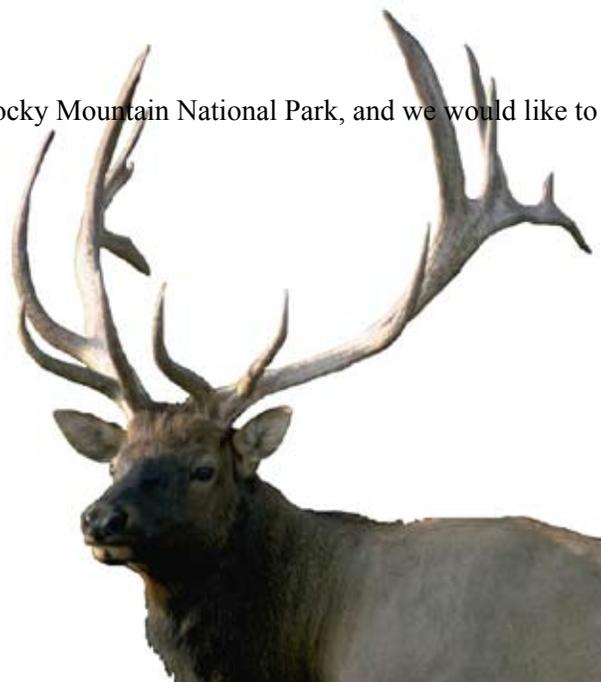
Hot Topics

This issue of Vistas is all about hot topics. There is a lot going on in Rocky Mountain National Park, and we would like to keep you up-to-date on a number of our important issues.

Hope you can come to the park soon. Spring is upon us, and the mountain bluebirds and Pasqueflowers are back!

See you out in the park,

Vaughn Baker
Superintendent



Elk and Vegetation Management Plan

Fact Sheet kept up-to-date on park website

The Draft Elk and Vegetation Management Plan/ Environmental Impact Statement for Rocky Mountain National Park identifies and assesses various management alternatives and related environmental impacts relative to managing elk and their habitat in the park. As part of the development of the final plan, alternatives are being adjusted and costs of the various options are being recalculated to reflect updated information. The plan, using adaptive management principles, will guide park management for the next 20 years. The final plan is currently being prepared and is scheduled for release in June 2007 with a Record of Decision to follow.

An Elk and Vegetation Management Fact Sheet with up-to-date information is posted on the park's website, www.nps.gov/romo. Follow the quicklink on the home page for current details.

2007 Road Projects

A summer full of major projects has started

Rocky Mountain National Park has 79 miles of paved roads. Trail Ridge Road and the Bear Lake Road account for the majority of the paved miles in the park.

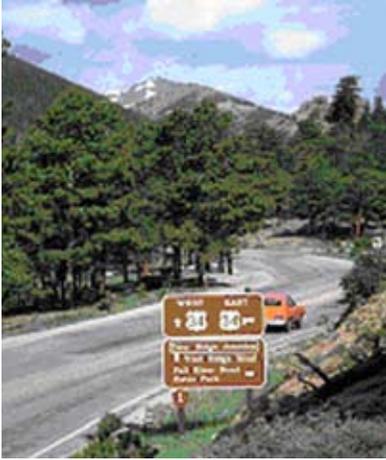
Trail Ridge Road

Work -- and closures -- began April 2

Trail Ridge Road, the highest continuous paved road in the continental United States, celebrates its 75th Anniversary in 2007. This awe inspiring road needs work that is long overdue. Critical repairs such as resurfacing the road from Deer Ridge Junction to Rainbow Curve, and six roadway slump repairs between Forest Canyon Overlook and the Colorado River Trailhead, are scheduled for the 2007 season.

Because Trail Ridge Road reaches an elevation of 12,183 feet, the only time to do work is during the summer. Park Service staff and the contractor will do their best to complete this major roadwork in a timely manner, on budget, and allow access to visitors.

From April 1 through May 24, Trail Ridge Road will be closed at Deer Ridge Junction for road resurfacing. The resurfacing will actually entail recycling the base by pulverization and then adding new asphalt on top. The closure will be in effect from Mondays at 6:00 a.m. through Saturdays at 6:00 a.m. The road will be open on Saturdays and Sundays.



Deer Ridge Junction is approximately 8 miles west of Estes Park at the junction of U.S. Highways 34 and 36

May 25 is opening day

Weather permitting, Trail Ridge Road will open on the Friday before Memorial Day, May 25, not prior, due to construction.

Delays and closures

From May 29 through June 29, resurfacing work will take place from Deer Ridge Junction to Rainbow Curve. During this phase, park visitors can expect 20 to 30 minute delays. There may be multiple areas of construction occurring concurrently and in that case the combined delay time will not exceed 60 minutes.

From July 5 through the end of the season, slumps will be repaired. Night closures from Forest Canyon Overlook to Alpine Visitor Center will be in effect from 10:00 p.m. through 6:00 a.m., beginning Sunday evenings and ending Friday mornings. Night closures will not occur on Friday and Saturday nights. Due to high traffic on Trail Ridge Road during the day, night work is the only way the contractor can finish the project during the summer. Federal Highway Administration counters located at Forest Canyon have indicated only a dozen vehicles typically travel over Trail Ridge Road during these times.

From July 5 through the end of the season, in addition to night closures, park visitors can expect 20 to 30 minute delays on Trail Ridge Road. There may be multiple areas of construction occurring concurrently, and in that case the combined delay time will not exceed 60 minutes. Although the majority of work will be done at night, some work, such as resurfacing, can only be done during the day due to temperature requirements.

All closures apply to cyclists as well. Cyclists should be prepared for rough road conditions.

The Federal Highway Administration awarded a \$10.1 million contract to Kiewit Western Company and is administrating this project on behalf of the National Park Service. Kiewit was the contractor for the successful, major Bear Lake Road reconstruction project that took place in the park during 2003 and 2004. Funds are from the Federal Lands Highway Program.

The park has developed a communication plan for a variety of audiences to convey pertinent information about delays and night closures.



Trail Ridge Road near a slump repair area. The season to repair this road, which climbs to over 12,000 feet above sea level, is very short.

Bear Lake Road

Also in 2007, the park will be conducting a chip seal project on the upper 5 mile section of the Bear Lake Road. Prep work for the chip seal will begin June 19 and continue until July 21. The prep work will include shoulder stabilization and crack sealing with delays no longer than 15 minutes. The proposed start date for chip seal is July 10 and the work will continue until September 1. During this project visitors can expect 20 minute delays Tuesdays through Fridays with no delays over the weekends.

Other Projects

Additional projects and maintenance work that will be occurring in 2007 are listed below. It is not anticipated that this work will affect traffic flow.

- Annual road shoulder maintenance June 12 – July 31
- Annual road striping May 15 – June 15
- Rock wall repairs on Trail Ridge Road between Lake Irene and Farview Curve



Conditions permitting, Old Fall River Road should open on June 30 and remain open at night with current one way status allowing travel from east to west only

Air Quality

Draft Documents and Hearings for Rocky's air

Air quality is more than just blowing in the wind in Rocky Mountain National Park. Scientific study has been ongoing for decades and the park is collaborating with partners to address issues.

Draft Nitrogen Deposition Reduction Plan available for review

In March 2007, a collaborative working group, which consists of members from the National Park Service, the Colorado Department of Public Health and Environment, and the Environmental Protection Agency – Region 8, under the direction of the Colorado Air Quality Control Commission subcommittee, drafted the Rocky Mountain National Park Nitrogen Deposition Reduction Plan (NRDP). This plan is currently available for public review until April 19, 2007, at: <http://www2.nature.nps.gov/air/ndrp/>. The plan addresses (1) available nitrogen emissions reduction options/programs; (2) a technical assessment of emission sources and transport issues that contribute to nitrogen deposition in the park; (3) implementation measures to reduce nitrogen emissions and park impacts; and (4) recommendations for future needs to assure continued progress and achievement of park resource management goals. The plan will be a living, working document, able to accept changes over time and as new information arises. It is tentatively scheduled for completion by summer 2007.

April 19 Hearing on Nitrogen Deposition

The Colorado Air Quality Control Commission has formed a special subcommittee to focus on the nitrogen deposition issue of Rocky Mountain National Park. A hearing on the Rocky Mountain National Park Initiative will be held Thursday, April 19, from 6 - 9 p.m. at the Estes Park Conference Center (adjacent to the Holiday Inn). The agenda plus other information can be found on the Colorado Department of Public Health and Environment's Air Pollution Control Division website: <http://www.cdphe.state.co.us/ap/rmnp.html>.

Collaborative Effort

Following a series of discussions that began in early 2004, the NPS, the Colorado Department of Public Health and Environment, and the Environmental Protection Agency – Region 8 signed a Memorandum of Understanding (MOU) in December 2005, formalizing a collaborative approach to address these serious air quality issues.

Laws Mandate Park Policies

The National Park Service (NPS) is mandated by several legislative acts to maintain and preserve natural conditions at Rocky Mountain National Park for future generations. These acts include the 1915 Act that established Rocky Mountain National Park, the NPS Organic Act (1916), the Wilderness Act (1964) and the Clean Air Act amendment (1977). Rocky Mountain National Park is classified as a Class 1 air quality area (cleanest air designation) as defined by the Clean Air Act.

The following is a list of issues currently affecting park resources and visitor experiences.

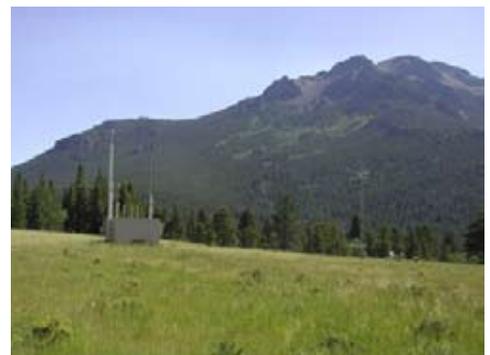
Atmospheric Deposition

Atmospheric deposition at Rocky Mountain National Park includes potentially harmful elements such as sulfur and nitrogen. Over 23 years of scientific research indicates that nitrogen deposition is at elevated levels, potentially 18 to 20 times greater than natural background levels. If this current trend continues unabated, sensitive aquatic species, including fish, could be affected in the next several decades. Artificially elevated levels of nitrogen deposition may also affect unique alpine tundra plant communities, changing the delicate plant composition.

Ozone

During the past four summer seasons, Rocky Mountain National Park has experienced 14 exceedances of the 8-hour EPA health standard. There are two primary concerns related to high ozone levels in the park. First, visitors come from all around the world to explore, hike and climb in the park. Visitors with preexisting respiratory ailments may be affected when exerting themselves at high elevations and high ozone levels. Second, there are eleven different plant species present at Rocky Mountain National Park that are known to become injured with elevated ozone levels. A multi-year study was initiated in July 2006, to survey for foliar ozone injury within the park. Also, the eastern

This RMNP air quality monitoring station measures ozone, elements of visibility, other gaseous pollutants and meteorological events.



portion of the park has been included in a seven-county Ozone Non-Attainment zone and Early Action Compact to address ozone issues. The entire park will implement public ozone/health advisories consistent with the State of Colorado ozone alerts.



Ponderosa pine (foreground) and quaking aspen are two of the 11 different plant species present at Rocky Mountain National Park that are known to become injured with elevated ozone levels.

Regional Haze

Visibility impairment is one of the most basic indicators of pollution in the air. Haze occurs as a result of the scattering and absorption of light by particles and gases in the atmosphere. Two of the leading agents impacting visibility at Rocky Mountain National Park are ammonium nitrate and ammonium sulfate. Without the effects of pollution, a natural visual range is approximately 140 miles at Rocky Mountain National Park. The current average visual range for the park is approximately 33-90 miles. The park will continue to monitor haze and visibility through a variety of methods and continue to work with the Colorado Department of Public Health and Environment on long-range goals for reducing haze along the Colorado Front Range.

Critical Load

Recent peer-reviewed scientific research has determined that an effects threshold for nitrogen deposition has been exceeded and direct injury to natural resources and associated processes has occurred. Under the MOU's direction, Rocky Mountain National Park has established a nitrogen deposition resource management goal for high alpine ecosystems east of the Continental Divide. In July 2006 the agency signatories formally endorsed this threshold or critical load of atmospheric nitrogen deposition that was found at 1.5 kg N/ha/yr of wet deposition and occurred in the late 1950s. Natural concentrations are estimated at approximately 0.2 kg N/ha/yr. Current levels are approximately 4 kg N/ha/yr.

Climate Friendly Parks

Also in March 2007, the National Park Service and the U.S. Environmental Protection Agency jointly held a Climate Friendly Parks Workshop in Estes Park. Other participants included Larimer County, Boulder County, the Town of Estes Park and the Colorado Department of Public Health and Environment. Climate Friendly Parks is a process in

which park emissions of greenhouse gases and criteria air pollutants based on typical park operations are estimated; large sources of those emissions are identified; ways to possibly reduce many of those emissions are discussed including methods to provide education and outreach to park employees, visitors, partners, local communities and other stakeholders are identified; and action plans to reduce emissions within given timeframes are created.

Bark Beetles in the Genus *Dendroctonus* and *Ips*

Park to Continue Beetle Management Efforts in 2007

Additional Funding Received

Bark beetles are native insects that have shaped the forests of North America for thousands of years. The effects of bark beetles are especially evident in recent years in and around Rocky Mountain National Park (RMNP) with a severe epidemic of mountain pine beetle (*Dendroctonus ponderosae*) occurring in Grand County. Over the last eight years, mountain pine beetles have killed most of the large diameter lodgepole pine trees in outbreak areas within Grand County. In some areas, mountain pine beetles have attacked trees as small as three inches in diameter. Additionally, beetle-caused mortality on the east side of the park within Larimer and Boulder counties appears to be on the increase.

Natural History

Bark beetles range from Canada to Mexico and can be found at elevations from sea level to 11,000 feet.

There are 17 native species of bark beetles in the family *Dendroctonus* and *Ips* known to occur in RMNP that have evolved with the local forest ecosystem. Periodic outbreaks of native bark beetles have occurred throughout the history of the park. Though bark beetles cause a substantial loss of trees, they are recognized as part of "natural conditions." Preservation of natural conditions is specifically mentioned within the park's enabling legislation. In the park's backcountry, which comprises about 95% of the park, bark

The adult Mountain Pine Beetle, *Dendroctonus ponderosae*, is about the size of a grain of rice. Its strong jaws can chew through bark.

USDA Forest Service – Region 4 Archives, USDA Forest Service, www.forestynipages.org



beetle populations are allowed to fluctuate under natural processes. In addition, there is no effective means of controlling a large beetle outbreak in such a vast area. In the remaining 5% of the park, which includes areas such as roadways, campgrounds, visitor centers, employee housing, picnic areas and historic sites, bark beetles are actively managed to protect high-value trees. High-value trees are important for shade, visual screening, cultural significance, and outstanding visual quality. Also within this area, the park removes beetle-killed trees that could topple and pose a threat to public safety, employee safety or property.

Beetle Attacks

Dendroctonus species bark beetles generally attack trees June through August but can attack trees starting in April all the way into September. Female bark beetles seek live green trees and typically attack on the lower 30 feet of the trunk. Females initiate a “mass attack” on a tree by means of a pheromone (a message-bearing chemical) that attracts mates and other females. During an attack, the adult beetles will seek cracks and crevasses between bark plates where they bore through the bark to gain access to the phloem (or vascular system) of the tree. Once they enter the tree, beetles bore tunnels (or galleries) within the phloem where they will lay their eggs. An individual female may lay in excess of 100 eggs. Following egg hatch, larvae feed in the phloem layer of the tree. Beetle eggs hatch in the fall and the larvae will spend approximately 8 months feeding within the tree before transforming into pupae. Emergence of new adults can begin in mid-June, where they will once again repeat this process. Under normal circumstances, beetles attack large diameter trees, usually over eight inches, but in severe epidemics, trees as small as three inches maybe attacked.

An infected tree will have pitch tubes on its trunk and boring dust (frass) at the base of the tree. Sometimes the tree will be successful in repelling or “pitching out” beetles and beetles are occasionally found imbedded in a pitch out. Solely relying on pitch tubes to determine if a tree contains live beetles is not always reliable. Frass found at the base of a tree that contains pitch tubes indicates beetles were successful in entering the tree, and it is very likely the tree will succumb to the beetle attack. Removing a small piece of bark at a pitch tube to check for live beetles or larvae in bore tunnels can be done to verify if beetles are present.

A key part of this cycle is the transmission of blue stain fungi (*Ceratocystis*). Spores of these fungi are carried from infested trees to healthy trees by the bark beetles. Fungi growing within the tree and the galleries constructed by the beetles interfere with the tree’s ability to transmit water and nutrients from the roots to the crown and contributes to tree mortality.

Current Situation

The acreage of bark beetle infestations within RMNP has increased significantly in Grand County and is increasing in Larimer and Boulder counties. As of 2006, 37,800 acres within the park have individual or large groups of dead trees with some areas of old growth lodgepole pine showing almost a 100% mortality rate. Drought conditions, mild winters, dwarf mistletoe infestations, and dense late seral mature forest stands have contributed to the outbreak.

Several species of bark beetles are presently killing lodgepole pine, ponderosa pine, limber pine, Engelmann spruce, subalpine fir and Colorado blue spruce. It is anticipated that large numbers of old growth trees in the park will succumb to bark beetles in the next decade. Bark beetles are part of the natural processes that occur within the national park and beetle-killed trees do provide benefits to the ecosystem, including habitat for woodpeckers and other cavity nesting birds, and providing woody debris in aquatic habitats that benefit fish.

Although part of a natural process, beetle-killed trees can threaten the safety of the public and park employees and can cause property damage if weakened trees topple. Also, beetle-killed trees contribute to forest fuels that can modify wildland fire behavior.



Beetle-killed lodgepole pine trees near Grand Lake
Photo courtesy of Debbie Mason

Management Approach

A Bark Beetle Management Plan for RMNP was approved in July 2005. The management plan allows bark beetles to continue their natural life cycle in backcountry areas of the park. In developed areas of the park, the following Integrated Pest Management Techniques are being used:

1. Sanitation: Removal of trees containing live beetles in high priority areas when populations of beetles are low, and destroying the beetle in all life forms by burning. Burning techniques used in the park include pile burning or using an air curtain burner.

2. Insecticide: The goal of insecticide application is not to kill bark beetles but to repel them and prevent them from attacking healthy trees. Sevin® Brand XLR plus Carbaryl will be used as a repellent to protect high value trees in areas such as campgrounds, housing areas, picnic areas, historic sites and other public use areas. The insecticide is applied using a sprayer mounted on a truck or All Terrain Vehicle (ATV) and is applied only to the trunks of individual high-value trees.

3. Hazard Tree Removal: Beetle-killed trees that pose a hazard will be removed to protect employee and visitor safety. Examples include tree removal at the Timber Creek, Moraine Park and Glacier Basin campgrounds.

4. Pheromone Packets: Anti-aggregation pheromones such as Verbenone may be effective where attacks are likely. However, a literature search and consultation with USDA Forest Service entomologists revealed that the pheromone is not effective in severe epidemics. No pheromone packets were used in 2006.

5. Education and outreach: RMNP will continue to work with park neighbors, both public and private, as the outbreak continues and in the years ahead as we deal with the long term consequences.

Current Situation

Work Accomplished in 2006

RMNP spent over \$100,000 managing bark beetles in developed areas of the park. The following work was completed:

- Sanitation: Approximately 600 trees containing live beetles were removed from the Colorado River District at the housing and utility area, around the Kawuneeche Visitor Center, Green Mountain housing area, Timber Creek campground, and Holzwarth Historic Site. Trees were hauled to the Pontiac Pit within the park and pile burned or burned in an air curtain burner. The park uses an air curtain burner to reduce smoke emissions. A total of 50 beetle infested trees were removed from developed areas on the east side of the park and pile burned.

- Insecticide: 1,000 high-value trees in the Colorado River District and 100 trees on the east side of the park were sprayed with Carbaryl in May. Trees that were sprayed in 2006 were not attacked by bark beetles.

- Hazard Tree Removal: Approximately 200 hazard trees were removed from developed areas of the park. Many of the trees were previously killed by bark beetles.

- Assessment: Aerial and ground surveys indicate that bark beetles in the Colorado River District are still at epidemic levels and are significantly increasing on the east side of the park.

Work Plan for 2007

RMNP's budget for bark beetle management in 2007 is \$167,000. As in 2006, sanitation, spraying high-value trees with an insecticide, hazard tree removal and assessment work will continue but at a larger scale due to more areas of the park being impacted. For example, work is escalating in the backcountry of the park removing hazard trees from backcountry campsites and fallen bark beetle killed trees from trails. The park is also developing a seven year comprehensive strategic plan for bark beetle management for anticipated work through 2013. The following work will be completed:

- High value trees around visitor centers, entrance stations, trailheads, historic sites, picnic areas, campgrounds and employee housing will be selected by park staff for insecticide application. For continued protection, trees must be sprayed each year until the epidemic has subsided. Park staff has consulted with entomologists from the USDA Forest Service Forest Health Management office in Lakewood, Colorado. That office will notify park staff when the epidemic has subsided to the point that insecticide spraying can be suspended.

- Hazard trees will continue to be removed from the above mentioned areas, as deemed necessary. As in 2006, hazard trees will be identified and removed by park employees.

- Sanitation will continue at the Holzwarth Historic Site and within areas on the east side of the park.

- The park has issued Special Use Permits to Mountain Parks Electric and Grand County to clear hazardous beetle-infested and beetle-killed trees along the power line rights-of-way and county roads that traverse the park near Grand Lake.



Air curtain burner