

Volcanic Vistas



Discover National Forests in Central Oregon Summer 2007

Welcome to Central Oregon!

In addition to providing diverse recreation experiences, maintaining healthy forests is a primary concern for the Deschutes and Ochoco National Forests. Good forest health is a condition whereby both natural processes and land management activities provide conditions that foster a resilient landscape. Wildfire, insects and disease are major components of a healthy forest ecosystem, as native forests in Oregon are significantly shaped by these natural events.

During your travels and adventures through Central Oregon forests, note the differences in the changing landscape. You will see a variety of forest conditions ranging from the effects of natural events like wildfire, to observing visible results of land management activities that help restore forest vegetation to historic conditions. You will learn more about these forest management practices in this issue of Volcanic Vistas. We are working to ensure that Central Oregon's forests are sustained for you, your family, and future generations to enjoy.



Leslie Weldon
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Deschutes National Forest

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What's Your Interest?

The Deschutes and Ochoco National Forests are a recreation haven. There are 2.5 million acres of forest including seven wilderness areas comprising 200,000 acres, six rivers, 157 lakes and reservoirs, approximately 1,600 miles of trails, Lava Lands Visitor Center and the unique landscape of Newberry National Volcanic Monument. Explore snow-capped mountains or splash through whitewater rapids; there is something for everyone. It's easy to see that Mother Nature worked overtime here.

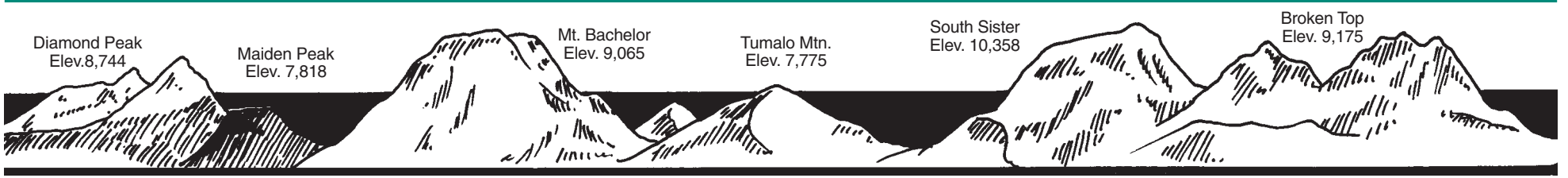


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Be Safe!

In an emergency dial 911



Outdoor Safety

When venturing out for the day, know your limitations. Always carry food and plenty of water... and drink it! Wear sturdy footwear, the terrain here can be rugged and unforgiving. A hat and sunscreen are advisable to protect against heat and sunburn. Do not hike alone. Tell someone your trip plans (destination and estimated return). Use maps. If your vehicle breaks down, stay with it. It is much easier to find a vehicle than a wandering person. Should you find yourself in trouble, don't panic. If you have your ten essentials and have followed basic precautions, help will be on the way.

Cell phones should not be relied upon as a top priority safety item. Many areas within and adjacent to the Wilderness areas do not have full coverage so service is not always available and batteries wear out without warning.

Ticks and Mosquitoes - Ticks can be found wherever there is vegetation and mosquitoes wherever there is moisture. Prevention is best. Wear light colored clothing, a long-sleeved shirt and pants (tucked into your socks in tick country). Insect repellent containing DEET can be sprayed on your clothing to help repel the little critters. Should you find a tick, remove it immediately. Place tweezers as close to the tick's head as possible. GENTLY pull the tick off.

Do you have the "10 Essentials" with you?

- Compass
- Extra clothing
- Extra food/water
- First aid
- Headlamp/flashlight
- Knife
- Map
- Sunglasses
- Waterproof matches and/or lighter
- Fire starter

Volcanic Vistas
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A Special Thank You to all the contributing writers, artists and photographers.

Helpful Web Sites

| | |
|--------------------------------------|--|
| Deschutes & Ochoco National Forests | www.fs.fed.us/r6/centraloregon |
| Northwest Forest Pass (to purchase) | www.naturenw.org |
| U.S. Forest Service | www.fs.fed.us |
| Bureau of Land Management | www.blm.gov |
| National Park Service | www.nps.gov |
| Oregon State Parks | www.prd.state.or.us |
| Central Oregon Visitors Association | www.covisitors.com |
| High Desert Museum | www.highdesert.org |
| Wildlife Viewing Site | www.fs.fed.us/r6/centraloregon/wildlife |
| The Museum at Warm Springs | www.warmsprings.biz/museum |
| Sunriver Nature Center & Observatory | www.sunrivernaturecenter.org |

Weather Safety

Central Oregon's weather can change drastically in a short period of time. Be aware whether you're hiking, boating, backpacking or just sightseeing. The summer temperatures can reach 100 in the daytime and may dip into the 30s at night. It can snow in July! Be prepared!

Carrying plenty of water is a must on any outing. Mountain streams look refreshing but could contain the parasite giardia. Before drinking water from these sources, boil it 3 to 5 minutes, or use a 1-micron portable water filter. A hat and sunscreen are advisable to protect against heat and sunburn. Carry a little food, a windbreaker and have a safe visit.

Weather Averages

| | |
|----------------------------------|--------------------------------|
| Warmest Month | Mid-June, July and August |
| Warmest Day | August 1990, 103° F (39.4° C) |
| Coollest Months | December, January and February |
| Coldest Day | January 1980 -23° F (-30.6° C) |
| Average Yearly Rainfall | 11-19 inches |
| Average Yearly Snowfall | 15-77 inches |
| Average Days with Sunshine | 271 days |

Lightning, One Strike, You're Out

Thunder and lightning storms occur frequently. If you are caught in a storm, follow basic safety procedures. Start counting when you see the lightning and stop when you hear the thunder. A ten second count means that lightning is two miles away (4-5 seconds per mile).

- Be safe:**
- ★ Take cover indoors.
 - ★ Swimming, boating, fishing, get out of the water. If your hair stands on end, take immediate action.
 - ★ Stay out of windows and doors.
 - ★ Avoid trees. Go to a low area.
 - ★ A car provides the best cover - roll up all windows, do not touch any metal parts.
 - ★ While hiking, carry a 4 foot square piece of polyethylene as an insulator, crouch down on it, knees and feet together. Crouching lessens your chances of becoming a lightning rod.
 - ★ Groups attract lightning - separate.
 - ★ Get away from rocks. Rocks don't hold much water and your body does.
 - ★ Get off your horse. It may have metal shoes, bit and rigging in the saddle. If time, unsaddle your animal and put it in the brush.
 - ★ Turn off and move away from electronic devices.

Recreating With Pets

Many people recreate with their pets both summer and winter on National Forest lands and trails. You are responsible for the safety of your pet as well as for the safety of others.

★ Dogs are required to be on leash in developed recreation sites on Forest Service lands which includes campgrounds, day-use areas, and trailheads. Leashes are also required on all day-use areas along the Deschutes River corridor between Benham East and Meadow Camp from May 1 thru October 1.

★ Only a portion of the Three Sisters Wilderness requires dogs to be leashed and under physically restrictive control from July 1 to September 30. Dogs are required to be on leash at Moraine Lake, Green Lakes, Todd Lake, Broken Top and associated trails.

★ On most trails, dogs are not required to be on leash but must be within 15 feet and under reliable physical or voice control at all times.

★ Keep pets under control to prevent fights with other dogs, harassment to wildlife, or injury of other people.

★ Provide your pet with water at these higher altitudes.

★ Avoid taking your pet on jagged rocks and sharp surfaces found on the volcanic terrain.

★ If you lose your pet, call the Humane Society of Central Oregon at 382-3537.

★ If you find a pet, call the Bend Bulletin at 385-5809 to run a "Found Pet" ad for free.

Car Clouting-15 Seconds or Less

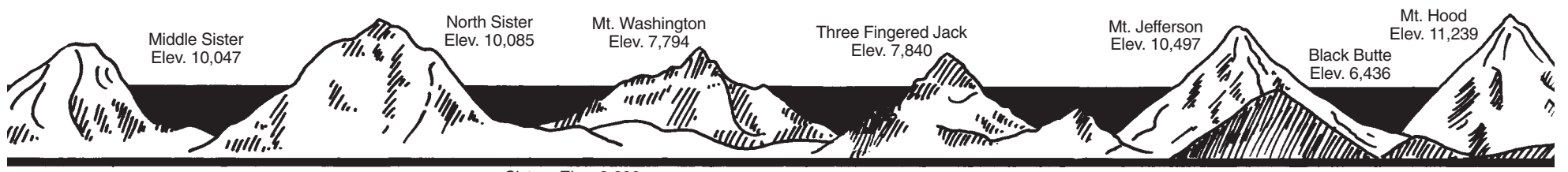
Trailheads, parks and monuments have become increasingly popular sites for car clouting, vandalism and thefts from vehicles. Car clouters prefer to prowl parking lots and campgrounds. If you are hiking or tent camping, take all of your valuables with you or keep them hidden in your trunk. Notify authorities immediately if you see suspicious characters or if you are a victim of car clouting or any other crime.

Production of this publication is through a partnership between the Northwest Interpretive Association (NWIA) and Deschutes National Forest.

Need More Information?

| | |
|---------------------------------------|----------|
| Deschutes National Forest | 383-5300 |
| Bend/Fort Rock Ranger District | 383-4000 |
| Sisters Ranger District | 549-7700 |
| Crescent Ranger District | 433-3200 |
| Bend Seed Extractory (tours by appt.) | 383-5481 |
| Redmond Air Center (tours by appt.) | 504-7200 |
| Ochoco National Forest | 416-6500 |
| Paulina Ranger District | 477-6900 |
| Lookout Mountain Ranger District | 416-6500 |
| Lava Lands Visitor Center | 593-2421 |
| Historic Paulina Lake Guard Station | 536-8802 |

Go To Special Places



What Can I See In?

Sisters Elev. 3,200

As seen from Lava Butte

If you are new to Central Oregon, or just looking for something new to do, here are a few suggestions tailored to fit just about any schedule. Find the location where you want to start and you're on your way to new discoveries.

Lava Lands Visitor Center

One Hour – See Visitor Center, hike Trail of Molten Land or drive Lava Butte.

Two Hours – Explore Lava River Cave or drive to Benham Falls Day Use Area to hike the falls trail.

Half Day – Add a visit to Lava Cast Forest.

All Day – Add a trip to Newberry Caldera or a visit to the High Desert Museum or visit the Sunriver Nature Center and Observatory.

Newberry Volcano

One Hour – Stop at the Paulina Creek Day Use Site or see the Big Obsidian Flow.

Two Hours – Hike the Big Obsidian Flow Trail or drive to the top of Paulina Peak.

Half Day – Hike Paulina Lake Trail or Paulina Peak Trail.

All Day – Hike a one-mile nature trail at East Butte Lookout.

Cascade Lakes Area

One Hour – Visit Historic Elk Lake Guard Station on Cascade Lakes Scenic Byway.

Two Hours – Hike the Ray Atkeson Trail at Sparks Lake or ride Mt. Bachelor's Sunrise Chair to the Summit for a spectacular panoramic view.

Half Day – Float on Hosmer Lake, fish any of the Cascade Lakes, or hike Todd Lake for wildflowers in July & August.

All Day – Hike 10-miles round trip to Green Lakes.

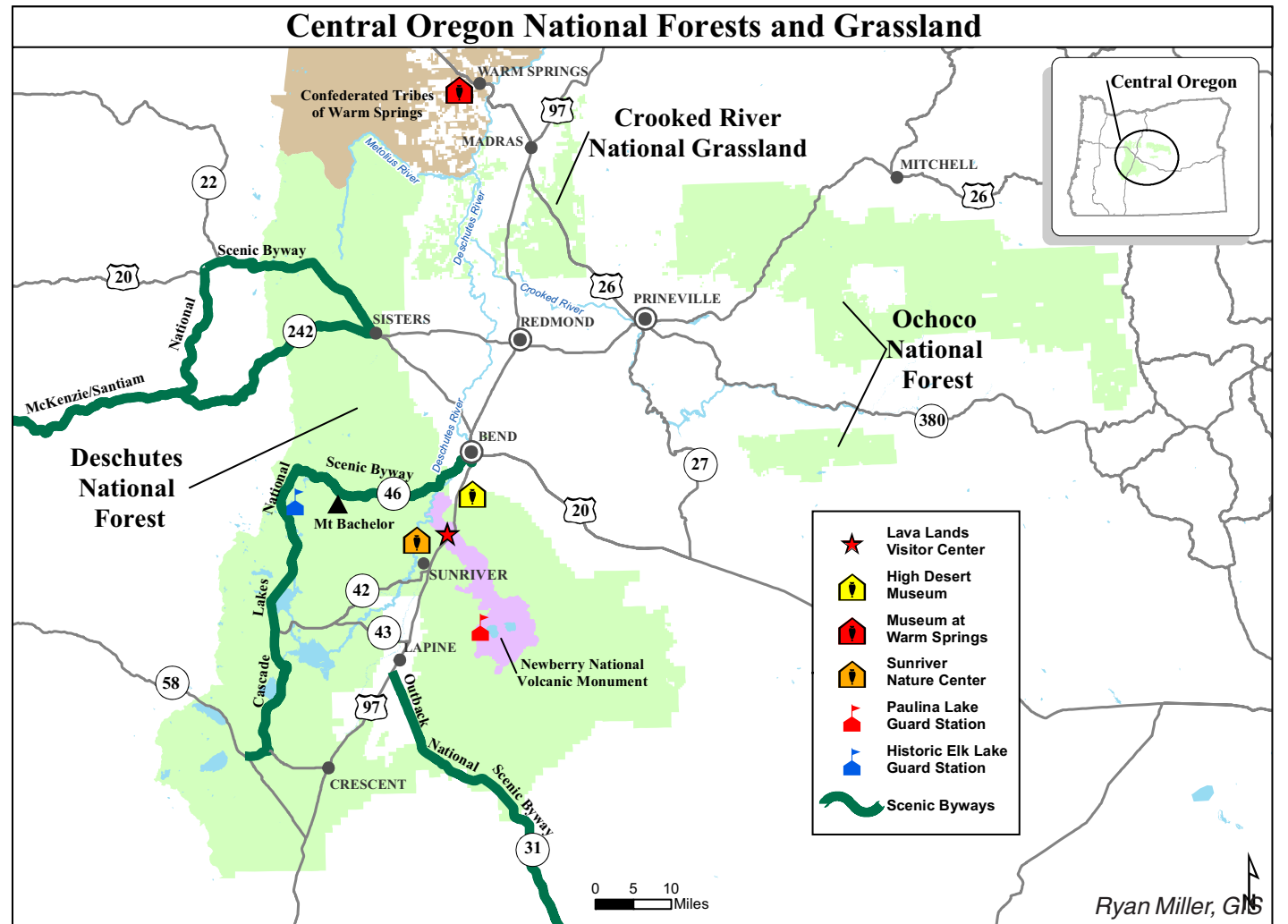
Crescent Area

One Hour – Visit Crescent Lake or Odell Lake.

Two Hours – Drive to Walker Mountain Lookout.

Half Day – Drive to Big Marsh near Davis Lake and hike two-mile Nature Trail.

All Day – Drive Cascade Lakes Scenic Byway to see eagles, osprey and other wildlife at Davis Lake, Wickiup Reservoir and Crane Prairie Reservoir.



Sisters Area

One Hour – Drive to head of the Metolius River, see Mt. Jefferson and hike the river trail.

Two Hours – Visit Wizard Falls Fish Hatchery on Metolius River.

Half Day – Hike Metolius River Trail or to top of Black Butte.

All Day – Drive McKenzie Pass to Dee Wright Observatory then to Proxy Falls, return via Santiam Pass.

Prineville Area

One Hour – Drive along Crooked River to Bowman Dam and Prineville Reservoir. Watch for spectacular spring wildflowers!

Two Hours – Drive to Big Summit Prairie in summer for the wildflowers or up Crooked River to hike Chimney Rock Trail or tour Rimrock Springs for birds and wildlife.

Half Day – Drive to Mill Creek Rd to see Stein's Pillar and Brennan Palisades, return to Prineville via Harvey Gap or visit The Museum at Warm Springs.

All Day – Visit Prineville Reservoir State Park for boating, fish Crooked River and hike Chimney Rock Trail.

Discovering the Deschutes River and Black Rock Trail

The fresh smell of ponderosa pine and the soothing sounds of the nearby Deschutes River will greet you as you begin to explore the Deschutes River Trail starting just outside of Circle Seven in Sunriver and intersecting with the Black Rock Trail at the Benham Falls East parking lot while ending at Lava Lands Visitor Center. During the fall of 2003 a seven and a half mile trail was completed by the U.S. Forest Service giving bikers, hikers, and sightseers recreational opportunities to experience and see a part of Central Oregon's unique landscape. When exploring the first three miles of the trail you will wind through a gentle sloping forest overlooking the Deschutes River. You may be fortunate to see different types of wildlife associated with the forest and riparian areas along the river. Animals that inhabit the area include deer, elk, coyote, raccoon, and a variety of birds including eagles and osprey.

The Benham Falls East parking area located at mile marker three provides an excellent setting for taking a break and learning about the history of the area through several interpretive signs. There are restrooms and picnic tables scattered throughout a giant stand of ponderosa pine hundreds of years old. These magnificent orange and yellow trees were left by the Shelvin-Hixon Timber Company so their families could enjoy picnic outings near the river in a park-like setting. The ponderosa pines tell a story of the historical significance of the area associated with the Deschutes River. This is explained at the half mile interpretive trail to Benham Falls and the quarter mile interpretive loop to the old mill site. Forest Service Road 9702 at Lava Butte will take you to the Benham Falls parking area.

The last section of trail to Lava Lands Visitor Center skirts the flanks of a seven thousand year old lava flow from Lava Butte. Lava from this flow backed up the Deschutes River creating many of the cascading waterfalls on the river as you head towards Bend. Lava Lands offers an excellent place to fill your drinking water, take a break, and enjoy displays and exhibits that speak to the past and present features that continue to shape Central Oregon. The best times to use the Deschutes River and Black Rock Trail are May through September. You can start on either end of the trail and parking is available at a pullout northeast of Circle Seven off Forest Road 600 in Sunriver and at the south parking lot at Lava Lands.

– Jason Merwin, Interpretive Specialist

Forest Restoration

Pringle Falls Experimental Forest - 60 Years of Forest Research in Central Oregon

Many visitors traveling through Central Oregon might think that little research has been conducted in these natural-appearing forests straddling the Deschutes River. Others may not realize that, during the time when most viewed these forests mostly as vast sources of timber wealth for building the local economies, a forest research community was quietly at work, eventually locating a dedicated research center in Bend in 1946.

Yet a fascinating story can be told of the many decades of research that has taken place in these forests of Central Oregon, and notably within the Pringle Falls Experimental Forest. As this story dates back to the early days of the Forest Service, a familiar name or two shows up from time to time.

The Early Years (1914 - 1930s)

In 1914, Thornton Munger, a colleague of the founding Forest Service Chief, Gifford Pinchot, selected the Pringle Falls site in Central Oregon for development of an “eastside” ponderosa pine research facility. The purpose of such an establishment was to gain a better understanding of the many forest resources, the unique ecology of these forests east of the Cascade Mountains, and how the forest would respond to environmental changes, including timber harvests, reforestation and even wildfires.

Pringle Falls, the oldest experimental forest in the Pacific Northwest, was developed as part of a national network of “outdoor laboratories” for the national forests. By 1936, two Research Natural Areas had been established to provide for non-manipulative studies and research applications. The larger parcel of the experimental forest, Pringle Butte (7,520 acres) is located approximately 7 miles west of Wickiup Junction, in southern Deschutes County. The smaller parcel, Lookout Mountain (3,535 acres) is located about 12 miles due west of the community of Sunriver. Both parcels together provide the backdrop to those many years of diligent scientific studies.

Experimental Forest in Full Swing (1930s – 1970s)

The “salad days” for the experimental forest began in the mid-1930s, lasting through the 1970s. Early on, forest researcher Paul Keen published a rating system for evaluating the health and vigor of ponderosa pine trees in 1936. This landmark research application, which became known as the “Keen” classification system, is still used by foresters today to quickly assess a tree’s long-term prognosis for survival following beetle attacks.

At around the same time, tree and shrub competition studies began in earnest on the experimental forest. In order to assess how best to reforest the harsh pumice soils of Central Oregon, researchers embraced the scientific method in setting up numerous tree survival experiments. Over the years, a cornucopia of research results was added, and an extensive body of work was published in research journals, technical notes and scientific proceedings.

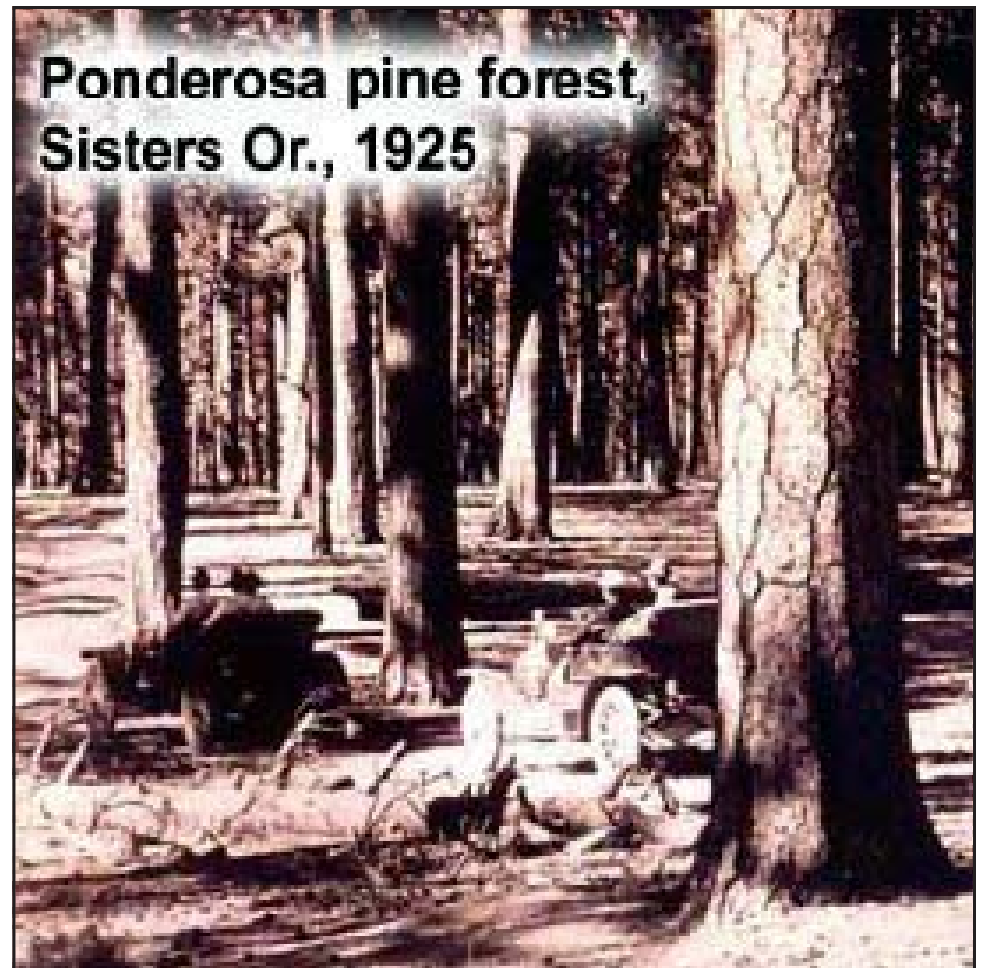
In addition, research involving the use of prescribed fire to control shrubs, studies on soil physical and chemical properties, seedbed requirements to achieve natural reforestation, and logging methods developed to ensure seedling and sapling survival were studied in great detail.

Silviculture Laboratory Closes in 1996, Research Continues (1970s – present)

In the 1970s more studies were added on the experimental forest, as permanent research plots were established to assess long-term site productivity, including the response to soil augmentation (fertilization). At about the same time, now well-known tree density and growth study plots were established to assess the results of a variety of thinning activities. Similarly, numerous studies on the growth and survival of dwarf mistletoe-infected pines have been studied, including their response to thinning and fire effects.

The Bend Silviculture Lab was shuttered in 1996, and much of the research passed on to more distant research facilities. While certainly not operating at the same pace as in previous decades, research continues on the Pringle Falls Experimental Forest. Current work is ongoing at the experimental forest, with scientists from the Pacific Northwest, Pacific Southwest, and university research communities participating. After all, the Pringle Falls Experimental Forest still provides a host of valuable information on the pine forests that we all enjoy in Central Oregon. -

Bill Peterson, Natural Resources Team Leader



Wide open Ponderosa pine forest reflects the effects of a natural fire cycle - fire that burned through the area periodically, reducing the accumulation of dead branches, pine cones and other forest litter while returning nutrients to the soils for a healthy population of Ponderosa pine trees. Healthy trees are more likely to withstand periods of drought and resist insect infestation.



Ponderosa pine forest - similar to above after applying various fuel reduction techniques such as thinning, mowing, and prescribed burning.

Recommended reading for additional information:

Joslin, Les (in press). Ponderosa Provenance: Gen. Tech. Rep. PNW-GTR-XXX. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.

Youngblood, Andrew. 1995. Research publications of the Pringle Falls Experimental Forest, Central Oregon Cascade Range, 1930 to 1993. Gen. Tech. Rep. PNW-GTR-347. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 45p.

Forest Restoration

Central Oregon Ponderosa Pine Forests: Then and Now

As you drive through the forest, do you ever wonder what they were like 100 or 200 years ago? Did it look and “act” the same as it does today? Prior to European western expansion and settlement much of the historic forest structure of Central Oregon was made up of large Ponderosa pine trees. These forests were open and park-like; maintained in this condition with frequent, low intensity fire; resulting in a landscape dominated by large Ponderosa pine trees.

That was then...Historic fire records indicate low intensity fires maintained and thinned pine stands in the eastern Cascade Mountains. These fires consumed understory vegetation, ground fuels and reduced the probability of stand replacing crown wildfire. This frequent fire maintenance, which occurred on average every 7-15 years, helped to maintain pine forest conditions for hundreds of years. With its thick bark, Ponderosa pine is more resilient to these low intensity fires which in turn made them also relatively resistant to large-scale die-offs from forest insects and diseases. Thus the frequent fires maintained perfect forest conditions for the Ponderosa. Other thin barked tree species, such as lodgepole pine or white fir, cannot tolerate the frequent fires, so they were less common in the forest landscape. All of this made the Ponderosa pine forest a dominant landscape in Central Oregon.

This is now...Changes in forest density, composition, and public use have occurred across Central Oregon forest's since the early 1900s. Current forest conditions across much of Central Oregon will not support low-intensity fires through either natural or planned ignitions (prescribed fire). Fire suppression since the early 1900's has allowed an increase of high hazardous fuel loading across the landscape. Fuels consist of anything from tall grasses, shrubs and brush and “ladder fuels” which can be all of these including trees. These fuel conditions have shifted forest fire effects today from frequent low severity to infrequent moderate and high severity stand replacing wildfires. Over time, exclusion of fire led to increased stand density with young and small diameter trees and encroachment of other tree species, all of which added higher fuel loadings than the historical condition. Without the frequent low intensity fires that occurred in the past, mixed forest stands (lodgepole pine, true fir) grew in areas that were once Ponderosa pine dominated. Competition for resources that trees need to survive, mainly water and nutrients in the soil, have put the Ponderosa pine forest at greater risk of mortality from insect infestation, forest diseases and stand replacing wildfire. Once forest's have more trees in a given area than there is food and water to maintain them in a healthy condition, the trees become stressed, giving insects and diseases an opportunity to move in for the kill.

Urban growth adjacent to the national forests has created additional need to maintain conditions that support low intensity fire behavior. This not only helps protect local communities, but also provides safe areas for fire fighters to support fire suppression efforts adjacent to residential developments and other facilities and structures.

Looking ahead...Within areas historically dominated by Ponderosa pine the desired condition is to have pine as the dominant species in the size and configuration that represent historic diversity; and to have fire condition that reflects those historic and desired conditions.

In general, desired conditions for pine forests in Central Oregon are stands consisting of large diameter, widely spaced pine with low surface and ladder fuels which are resistant to fire and insect mortality. Forest management activities, such as thinning and prescribed fire, would result in conditions that would be unlikely to support high-intensity wildfire. This is a result of treatment areas being of a size and orientation that reduces the likelihood of large fire spread, and facilitates successful fire suppression under severe wildfire conditions.



Wamput Butte, plot #5, prior to any thinning or prescribed burning. Note the amount of fuel - dead branches and other forest litter - on the ground.

Forest Management Techniques

Thinning & Mowing - At the turn of the 20th century much of Central Oregon's forests were comprised of 110,000 acres of old-growth pine and were in private ownership. The owners logged most of the large trees in the 1920s and 1930s. The remaining large trees became surrounded by a very dense forest of smaller pine and encroaching white fir. These lands are now important for native plants and animals and include adjacent key urban interface areas. Since the 1980s, 35% of the area has been thinned to levels that more resemble historic conditions. Today our thinning practices remove the smaller trees first, leaving the larger and other large trees in the stand to mimic historic conditions. Because these forests serve as habitat for deer and other wildlife, thinning projects leave untreated patches for wildlife cover.

In some cases brush has been mowed to redistribute and reduce fuel loads. Mowing is just what it sounds like: a large “lawn” mower pulled behind a tractor to prepare the area for prescribed burning by reducing brush, small shrubs and grass.

Examples of dense stand conditions that are atypical of historic conditions can be viewed along Highway 97 south of Bend, Lava Lands Visitor Center and the Sunriver area. Parts of this forest area are scheduled to be thinned in the next 1-5 years to move towards more historic Ponderosa pine condition. The thinned areas will also be mowed to remove fuels, and will then be treated by prescribed fire to further mimic fire resistant stand conditions that existed prior to settlement of the area.

Prescribed Burning - The use of prescribed burning, the historic disturbance process that long ago maintained the long-lived, old-growth Ponderosa pine forest, is another tool used in forest management to reduce fuels and stand density. Conditions for prescribed burning have to be just right to keep the fire in control, and to manage the smoke generated by the burn. This is especially true where it has been absent for many years, sometimes decades. Conditions are monitored the day of the prescribed fire and must meet Oregon State standards before it can commence. Prescribed burns can produce dramatic visual effects with the blackened boles and small dead trees. However, these effects are short lived; five years later, there is little evidence of these prescribed burns.

As conditions in nature are continually changing, continued treatment is required to maintain the historic Ponderosa pine forest. Forest managers on the Deschutes and Ochoco National Forest's are currently working on a variety of restoration projects that will restore Ponderosa pine forests to more historic conditions. So, as you're driving down the road and see sometimes vast differences in Ponderosa pine forests, think about what the forest may have looked like 100-200 years ago, and what you are seeing today. *For more information on Fire and Prescribed burning, see page 10.*



Wamput Butte, plot #5, after thinning and prescribed burning. Note the ground fuels have been removed as well as low hanging branches that may act as a ladder, leading wildfires from the ground to the top of the trees.

Want to see examples of Forest Management techniques?

Thinning and prescribed burning was done around Black Butte Resort and along the visual corridor west of the town of Sisters along Highway 20. You can also see an example of this at the Turn of the Century Forest along Forest Road 43 southwest of Bend where several interpretive signs will provide information on this portion of the forest.

To view areas that have been thinned or mowed, travel along the Lava Cast Forest road or China Hat road. Several examples are easily viewed as you approach Lava Cast Forest. Similarly you can see other areas just outside of Bend along China Hat Road near the 18 Fire.

Forest Restoration

Looking for a place to see Whitebark pine?

Whitebark pine is distributed throughout most of the higher elevation peaks and mountain tops of the Deschutes National Forest. Visitors can see these beautiful trees as they trek the high country of the Three Sisters Wilderness. Some of the more accessible populations to observe include the upper areas around Paulina Peak. They will also stand beside them as they look over Newberry rim into Paulina Lake at the Paulina Peak overlook. Also, Mt. Bachelor has good populations of whitebark pine on the upper slopes of the ski area.

For the more adventurous hike to the summit of Black Crater outside of Sisters for excellent viewing. Other good trails for viewing include Tam McArthur, Black Butte and Broken Top.



Whitebark pine on Ball Butte. Whitebark pine is a very important component of high elevation ecosystems, and is often referred to as a keystone species. It helps stabilize soil and slow down spring runoff. Small weather beaten stands on slopes and ridges create habitats for other plants and animals in this rugged landscape. - Photo: Chris Jensen

Cone Protection Required

Because of the Clark's nutcracker persistence, whitebark cone collecting requires unconventional tactics compared with other pine species.

The process starts by climbing the tree and installing wire cages around cone clusters in early summer. In fall, when the seeds have fully ripened, the trees are again climbed, cages removed and cones collected.

Unlike other pine species, whitebark pine cones do not flare open to disperse the seed, but rather depend on birds (Clark's nutcrackers) to remove and "plant" the seed.

Cone collection can be complicated by the remote and roadless locations of most whitebark select trees, and requires packing climbing gear to the sites a minimum of twice a season.

Cages are absolutely necessary to protect a few cones from the voracious nutcrackers!

Unique Ecology

Whitebark pine seeds are unusually large and are very high in protein and fat. They are an important food source for many birds such as this Clark's nutcracker and animals, including grizzly bears in the Rocky Mountains.

Clark's nutcracker



Nucifraga Columbiana
Wilson Photo: submitted



One Tough Tree: Whitebark pine on Deschutes National Forest

The Cascade Mountains of Central Oregon provide a rugged climate for vegetation that calls this habitat home. One unique tree that does is the Whitebark pine (*Pinus albicaulis*). It is found in the high elevation sub-alpine zone here, and throughout most mountain ranges of the western United States and Canada. The species is a tenacious survivor often restricted to exposed ridges or drier sites in the rain shadow of these ranges. On wind-swept sites, it takes on picturesque shapes with twisted gnarly trunks and ragged crowns. On the most extreme sites, whitebark often grow in the form of weather beaten shrubs and clumps.

Whitebark pine is one of the five-needled (needles bundled in groups of 5) white pine species found on the Deschutes. Unlike other pine species, whitebark pine has very large and wingless seeds. Most other pine trees spread seed by wind blowing seed out of flared or open cones. Because whitebark pine cones do not flare open, they have evolved by relying almost exclusively on the Clark's nutcracker for seed dispersal.

This large jay-like bird has a specially developed bill for extracting or "jack hammering" whitebark seeds from the tough, pitchy cones. Once the seed is extracted from the cones, they store as many as 150 seeds in a special throat pouch to transport and cache them. The birds "cache" the seeds by drilling holes in exposed slopes in sub-alpine zones. They depend entirely on memory to retrieve the nutritious seeds from their caches for food. Seed that is lost or not retrieved by the nutcrackers germinate and continue the cycle of whitebark pine regeneration. It has been documented that Clark's nutcrackers have cached seeds on suitable sites 10 miles from the cone bearing tree where they were collected. This partnership between the nutcrackers and the whitebark is an excellent example of a coevolved mutualism, where two species directly benefit one another.

Challenges for Whitebark

As if the rugged habitat wasn't enough, the Whitebark pine is in trouble from other natural sources. Range-wide, the species is in decline due to a combination of several factors. The accidental introduction of an exotic fungus called white pine blister rust has resulted in severe losses of all of our "five-needled" pines, and has spread into these delicate whitebark pine ecosystems. This disease kills small trees quickly, disrupting regeneration of the species allowing other competing species like sub-alpine fir to become established in its place. Larger trees are killed more slowly by the disease, eliminating most of the valuable cone production which has a ripple effect on regeneration. Due to natural progression, blister rust has now spread throughout the entire range of whitebark pine, putting the species at risk of extinction. Hardest hit regions are generally in the northern Rockies, where infection levels are often over 70%. In the Central Oregon Cascades including the Deschutes National Forest, surveys are finding the disease incidence varies greatly from site to site, ranging from 0 to 100 percent infection on live trees.

Recent surveys in Crater Lake National Park in the southern Oregon Cascades indicate that over 20 percent of the trees are infected, and that by the year 2050 a loss of 46 percent of the mature whitebark pine is predicted.

The severity of the decline has increased due to outbreaks of mountain pine beetles which may kill trees that harbor natural resistance blister rust. This native insect historically killed mature whitebark pine in periodic

outbreaks. Signs of these older outbreaks can be observed in large numbers of "grey ghosts" or old dead and bleached whitebark "skeletons" in some areas. More recently, an epidemic of mountain pine beetle infestations is occurring putting more whitebark pine at risk. Fire suppression has contributed to replacement by other species such as sub-alpine fir which are not tolerant to fire. These species out-compete whitebark pine for site resources and contribute to their decline.

Restoration of Whitebark

Range-wide strategies are being developed for restoring whitebark pine populations in many States. Because of the progression of non-native pathogens like white pine blister rust, our best hope and most important strategy may be to increase the proportion of trees with natural resistance to white pine blister rust that will survive in the presence of the disease.

Forest personnel have been active collecting whitebark pine seeds from populations in the Deschutes National Forest. This will help preserve the gene pool and conserve genetic diversity in the event stands are lost to wildfire, beetle outbreaks, or disease.

Oregon and Washington screening for whitebark pine blister rust resistance is underway. Naturally occurring genetic resistance to this introduced, invasive pathogen is rare. Current screening will provide information on the frequency of this resistance throughout the western states, as well as identify resistant parent trees from which seed might be collected in the future for restoration efforts.

Efforts are being made to collect seed from healthy parent trees that appear to have natural resistance to blister rust. The best chance of locating resistant trees is searching within areas with high levels of infection, and focusing on trees clean of disease. Over 60 disease resistant candidate trees have been located on the Deschutes NF, and seed has been collected and submitted for blister rust resistance testing. Early results of region-wide resistance screening are encouraging. Although rare, some families are showing good survival and resistance to the disease.

Once blister rust-resistant trees are identified, future seed collected from resistant trees will be planted into natural populations to help increase levels of natural resistance. The Deschutes is cooperating in a pilot test to compare whitebark pine seed treatments and rodent protection methods to help develop better methods for future direct seed planting in whitebark habitat. Several sites on the Deschutes have been planted with whitebark pine seedlings to determine the best planting methods and techniques. *Continued page 7*



Stem canker on whitebark pine from blister-rust

Did you know?

Recent warming trends may also play a role in displacing whitebark pine as competing trees invades more of the natural range of whitebark. A warmer and moister weather pattern may also favor a higher incidence of white pine blister rust infections.

Forest Restoration

Tumalo Creek, Restoration of a Watershed Damaged by Fire

The Tumalo Creek Bridge to Bridge Restoration Project was completed in the fall of 2006, culminating a 4 year effort to restore a stream and associated wetlands severely damaged by a human-caused wildfire over two decades ago.

A camper's fire adjacent to Bridge Creek was left unattended on July 24, 1979, quickly spreading throughout the old-growth stands of mountain hemlock, white fir, ponderosa pine and Engelmann spruce within the Tumalo Creek watershed. Before it was extinguished, over 4,300 acres had been hotly burned, including nearly 3 miles along Tumalo Creek.

The fire left in its wake a damaged watershed. Trees, shrubs, and grasses that bind soils on hillslopes and streambanks, and provide shade and wildlife habitat were nearly eliminated. The exposed ground became susceptible to erosion when rainstorms and snowmelt came, washing sediments into Tumalo Creek and Bridge Creek. Turbidity and sedimentation increased within Bridge Creek, which provides a significant portion of the drinking water supply for the City of Bend. Timber salvage operations soon after the fire removed much of the timber, including that adjacent to the stream. Without the stabilizing influence of streambank vegetation and large woody material instream and on floodplains, Tumalo Creek began to unravel. Erosion of streambanks gradually increased the width of the stream, while becoming shallower and more braided. Pools and fish habitat decreased, and wetland

and riparian habitat was lost, and more was threatened by a channel ever-shifting.

Nearly a decade after the fire, it was recognized that Tumalo Creek needed help. Early efforts at restoring the damaged stream focused on adding trees to provide fish habitat but did not address the need for stabilizing the restless channel. Over time, it became apparent these early attempts were not effective and Tumalo Creek continued on a course of instability. Knowledge and techniques of restoration gradually improved since these early efforts, which led to a more thorough and complete analysis of the restoration techniques needed at Tumalo Creek.

Stream restoration design was based on established principles, using past and present aerial photography and data collected on reference reaches, which are undamaged areas of Tumalo Creek and other nearby streams. The channel was designed to decrease channel gradient, make the channel narrower and deeper, and increase the channel sinuosity (meandering) and length. Restoration was accomplished through the physical reshaping of sections of the channel, placing boulder and log jam structures, forming gravel bars, and creating side channels and small ponds. The number of trees within the channel was increased from about 19 pieces/mile prior to the project to nearly 200 pieces/mile post-project, providing increased fish habitat, including that of the sensitive species redband trout. Over 70,000 native riparian shrubs and trees were planted along the stream to re-establish bank stability and provide future

shade and large trees instream. Noxious weeds within the project area were removed as another component of the restoration.

Overall, 2.8 miles of Tumalo Creek was restored to a properly functioning stream with abundant riparian and wetland habitats, providing fish and wildlife habitat. But the work was not done after the last shrub was planted as multi-year student monitoring programs of hydrological and biological parameters have been developed through partnerships with Summit High School and Cascade Science School.

Because of the site's history and proximity to Bend, there are outstanding opportunities to raise awareness of wildfire, sustainable forest practices, habitat restoration, riparian vegetation and other elements of watershed function. The Upper Deschutes Watershed Council includes a tour of the site in *Riverfest*, the region's annual educational event. Multiple permanent interpretive signs related to site history, restoration, and watershed function are being developed and will soon be installed at several locations within the drainage.

Numerous partner contributions have made this project possible. Major funding partners have included the Upper Deschutes Watershed Council, National Forest Foundation, Oregon Watershed and Enhancement Board, and the Deschutes River Mitigation and Enhancement Board. The Oregon Department of Fish and Wildlife and Hap Taylor and Sons have also contributed.



Students help plant seventy thousand seedlings to restore natural vegetation and improve riparian stability. More than 2,100 trees were used to create log jams and pool habitat which in turn improved wildlife and fish habitat.

White Pine Blister Rust

White pine blister rust, caused by a fungal pathogen called *Cronartium ribicola*, was introduced to North America in the early 1900s. Since then it has caused dramatic changes in landscapes containing 5-needle pines by killing our native trees. The pathogen has a unique life cycle involving two hosts. The also infects species in the Ribes genus such as gooseberries and currants. Infection on Ribes plants is a leaf rust and generally doesn't lead to mortality. In the fall unique delicate spores, called basidiospores, are formed on the underside of Ribes leaves. These spores can become wind born and infect the needles of 5-needled pines. This infection slowly spreads from the needle to the stem of the pine tree causing cankers. Over several years these cankers can girdle stems and branches of the white pines eventually leading to mortality. In the spring the fungus produces a different spore type, called aeciospores, that is thick walled, tough, and capable of long distance spread. In some cases these spores have traveled upwards of 300 miles to infect Ribes plants. This alternating host cycle led managers to try and eradicate ribes plants during the CCC days to prevent infection and mortality of western white pine. - Chris Jensen, *Compiled by Chris Jensen, with information from "Whitebark Pine in Peril: A Case For Restoration" by John Schwandt, Forest Health Protection*



Beetle- whitebark pine on Tam McArthur rim - Photo: Tom Iraci



Whitebark pine on Ball Butte; Blister rust killing crown on Balle Butte - Photos: Chris Jensen



Explore Newberry Volcano



Paulina Lake from Paulina Peak, photo courtesy of Sherri Lee

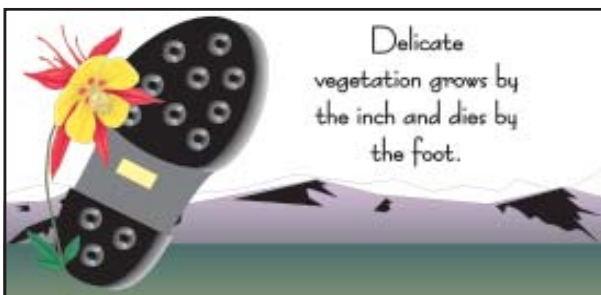
History

Newberry National Volcanic Monument is just south of Bend, Oregon, off Hwy 97. Community concern for the preservation of the area led to the establishment of the Monument in 1990. The Deschutes National Forest currently manages the Monument to preserve and protect the area's unique geologic and ecological resources. The exceptional scenic and recreational opportunities cover 50,000 acres.

Geology

Newberry Volcano is one of the largest shield-shaped volcanoes in the lower 48 states, covering over 600 square miles. The Monument is located along a group of faults known as the Northwest Rift zone. A complex geological history indicates that the volcano has erupted hundreds of times during the last half-million years. The most recent eruption was 1,300 years ago suggesting that the volcano is still active.

The caldera of Newberry is commonly referred to as **Newberry Crater** but it is truly a caldera like Crater Lake. This feature formed after a series of collapses following big eruptive episodes and now contains two crystal clear lakes. The Monument also has many other fine examples of common volcanic features such as cinder cones, ash flows, lava tubes and flows, pumice and obsidian deposits.



Recreation Pass Program on the Deschutes National Forest

Recreation Passes are required on Newberry National Volcanic Monument as well as designated day use sites on the Deschutes National Forest. This year introduces the Interagency pass for use on all federal lands in the United States. The Golden passes will continue to be accepted until expiration of the pass.

Passes accepted are:

- ◆ 3-Day Monument Pass
- ◆ National Forest Recreation Day Pass
- ◆ Annual Northwest Forest Pass
- ◆ Interagency Annual Pass
- ◆ Interagency Senior Pass
- ◆ Interagency Access Pass
- ◆ Golden Eagle Passport
- ◆ Golden Age Passport
- ◆ Golden Access Passport
- ◆ WA & OR Recreation Pass with Golden Eagle
- ◆ National Park Pass with Golden Eagle hologram

Passes are available at Forest Service offices throughout Washington and Oregon. The 3-day Monument Pass is only sold at Lava Lands Visitor Center, Lava River Cave, & Newberry Entrance Station.

Archaeology

The Newberry area has been inhabited by Native Americans intermittently for the last 10,000 years. Archaeologists hypothesize that early inhabitants used this area in much the same way we do – for fishing, hunting and recreation. Obsidian from Newberry was traded up and down the Pacific Northwest and has been found as far away as British Columbia in Canada. It is unlawful to remove or damage any rock, plant or artifact found within the Monument.

Recreation

Boating: Frequent steady winds make the lakes ideal spots for sailing and windsurfing. Motor boats are permitted on both lakes throughout the summer. There is a 10 mph speed limit in force, and Oregon fishing licenses are required.

Trails: Miles of hiking trails explore the Monument; most are open late spring through fall for hiking, horseback riding and mountain biking. The trails are also popular in winter with cross-country skiers and snowmobilers.

- Crater Rim Trail (21 miles)
- Paulina Lake Trail (7 miles)
- Peter Skene Ogden Trail, (8.6 miles)-
mountain bikes in uphill direction only
- Paulina Peak (4 miles)

Wildlife

Wildlife Observation: The caldera is a designated wildlife refuge. Mammals include deer, elk, badger, pine marten, and black bear. The lakes are home to osprey, ducks, geese, and tundra swans. A pair of bald eagles nest along the shore of East Lake. The 4,000 foot elevation change within the Monument spans several vegetation zones, including ponderosa pine, lodgepole pine, mixed conifer, mountain hemlock and white pine. All old growth stands are protected.

Did you Know....

- ◆ The flanks of Newberry are dotted with over 400 cinder or “parasite” cones? Many such cones are found along the Northwest Rift Zone, a line of fissures running from Newberry Caldera to Lava Butte.
- ◆ Based on geophysical and geologic evidence, a magma chamber (molten rock) probably lies 2 to 3 miles below the caldera floor.
- ◆ The Big Obsidian flow, found within the Caldera, formed 1,300 years ago. It is the youngest lava flow in Oregon.
- ◆ The last major caldera forming eruption probably occurred about 200,000 years ago. Since then, the caldera floor has gradually been filled in with ash, pumice and lava.
- ◆ Newberry is not part of the Cascades Mountain Range. It lies at the juncture of three major fault zones in Central Oregon.

A Fed Bear Could Be A Dead Bear!

If Newberry Caldera is also a wildlife refuge, why would black bears and other animals ever face destruction from animal control officers? The answer is that visitors, thinking they are being kind to the wildlife, feed animals or carelessly leave food where animals can raid it.



Newberry Caldera, the area within the rim of Newberry Volcano, has been a wildlife refuge for nearly half a century. All wildlife there enjoys protection from hunting or harassment by human visitors. The Caldera is also a highly popular recreation area containing 400+ campsites, two lakes, and spectacular volcanic scenery. Sometimes human and animal needs conflict and that most often revolves around food.

American black bears are occasional foragers at Newberry's campgrounds and day use sites. Bears can be very creative at food pilfering and can do extensive property damage trying to find your food. This can range from cooler clouting to breaking vehicle windows or destroying a tent.

Black bears are very dangerous and overcome their fear of people easily. **Keep your pets and children away from bears.** Bears that lose their fear of humans are often destroyed because of the risk they pose for injury to people. It is your responsibility to **store your food, leftovers and garbage out of bear's and other wildlife's sight and smell.**

Chipmunks, ground squirrels and birds may seem harmless, but these animals can be aggressive towards humans, too, biting or scratching to get food. Some may have diseases that humans can catch. Feeding these animals our food encourages them to stop foraging on their own, which can lead to starvation and death during winter.

Help keep wildlife in the Newberry Refuge wild. Do not contribute to the destruction of a bear or other animal by feeding it or improperly storing human and pet food. *-Larry Pratt, Deschutes National Forest*

What To Do

One Hour:
Lava Lands Visitor Center
Lava Butte
Paulina Falls
Big Obsidian Flow

Half Day:
Benham Falls Trail
Lava River Cave
Lava Cast Forest

Full Day:
Newberry Caldera
Paulina Peak
Paulina Lake Trail
East Lake Trail

Schedules

See page 16 for Visitor Center, Lava Butte and Lava River Cave schedules.

Interpretive program schedules will be posted at entrance stations, information desks, and campground bulletin boards. Please check the weekly schedule for times and locations.

Check for Road Conditions

Explore Newberry Volcano



Points of Interest

1 Paulina Peak, located four miles by road or trail from Historic Paulina Lake Guard Station, is the highest point within the Monument, 7,985 feet. The 360 degree view includes the Cascade Range from California to Washington; the Basin and Range region of eastern Oregon; and a clear view of the caldera lakes and surrounding landscape. **This road is not suited to trailers or motor homes.**

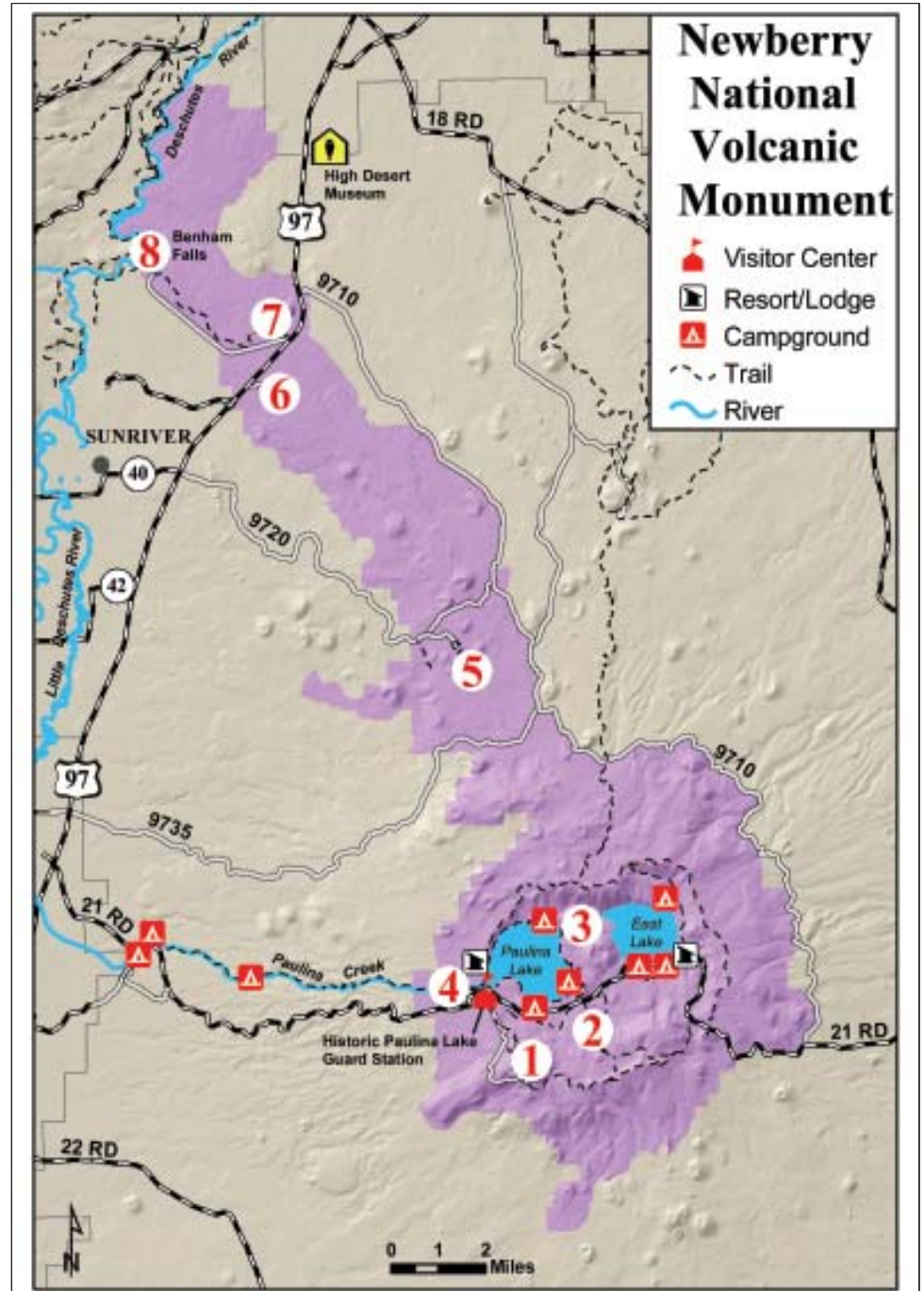
2 Big Obsidian Flow is the result of the most recent lava flow of Newberry Volcano, 1,300 years and is the youngest lava flow in Oregon. Over 170 million cubic yards of obsidian and pumice erupted from a vent about a mile south of the trailhead. Native Americans used the glass for trade and tools. A one-mile loop trail and seven interpretive signs guide visitors across a corner of the flow.

3 Paulina and East Lakes - The caldera may originally have held one large lake, much like Crater Lake, but deposits of pumice and lava divided the crater into two separate bodies of water. Paulina Lake is one of the deepest lakes in Oregon, 250 feet; East Lake is somewhat shallower, 180 feet. Clear and nutrient rich, both lakes support a large population of trout and salmon, stocked by the Oregon Department of Fish and Wildlife. The lakes offer excellent fishing from late spring through fall.

4 Paulina Falls is located just a quarter of a mile west of Paulina Lake Lodge. This dramatic 80 foot waterfall spills over volcanic cliffs into a canyon and is a short walk from the parking lot. Paulina Creek is the only surface outlet for Paulina Lake and has qualified for federal designation as a Wild and Scenic River.

5 Lava Cast Forest is approximately 7,000 years old. Lava from vents on Newberry Volcano flowed through a mature ponderosa pine forest. The molten lava enveloped the trees and quickly cooled around them forming a mold. The pines eventually burned to charcoal or ash. A one-mile self-guided interpretive trail winds across the lava flow, which is slowly being claimed again by young ponderosa pines.

6 Lava River Cave is located one mile south of Lava Lands Visitor Center on Hwy. 97. The one-mile cave is the longest lava tube in Oregon. Lava tubes form when a river of molten lava creates a channel and the sides eventually crust over to create the roof. The tube kept the flowing lava hot enough to drain out of the channel. The cave temperature is a constant 42½ degrees Fahrenheit (5 degrees Centigrade), so wear warm clothing and carry at least two light sources (only propane lanterns or flashlights please). There is an entrance fee from early May to mid-October and lanterns are available to rent.



Ryan Miller, GIS

7 Lava Lands Visitor Center and Lava Butte is 12 miles south of Bend on Hwy. 97. A key hub for travelers and Monument visitors, there are exhibits, a bookstore, water, trails, and picnic tables; a wide array of information services, and an energetic staff of interpreters.

8 The Deschutes River and Benham Falls are located on the northwest border of the Monument. The Deschutes offers some of the best flyfishing, whitewater rafting and kayaking in Oregon. A river trail from Sunriver to Bend has beautiful views for the hiker, biker or equestrian. Wildlife watching opportunities include beaver, otter, deer, elk, mink, martins, eagles, osprey and other birds.

Newberry Caldera: One Lake Or Two?

A question commonly asked about Newberry Caldera's Paulina and East Lake is "Were they ever a single lake like Crater Lake?"

Core samples collected by the United States Geological Survey from a geothermal test well drilled northeast of the Big Obsidian Flow in 1981 do indicate that a large lake existed here in the past. By about 12,000 years ago the separation of the two lakes was essentially accomplished. A small stream may have continued to connect the lakes for a few thousand years after the original lake was divided. This channel would now be buried under younger lava flows south of Little Crater.

Numerous volcanic features now occupy the area separating Paulina Lake and East Lake. The Interlake Obsidian Flows, which are accessible from the Paulina Lake Trail at the north end of Little Crater Campground, formed about 7,300 years ago. The Central Pumice Cone, which is visible on the west shore of East Lake, formed about the same time. - *Larry Chitwood, Forest Geologist*

Role of Fire in Central Oregon

The Story of Wildfire in Central Oregon

Fire plays a vital role in our Central Oregon environment. Many plants and animals have evolved to live with, and even require, wildfire to create habitat, open seeds, and reduce competition for resources. Take three of our most common Central Oregon tree species: lodgepole pine, ponderosa pine and western juniper. Although vastly different, each of these trees has a unique relationship with fire.

Lodgepole pine - Lodgepole pine is susceptible to intense fire because of its thin bark; however, it has a method for reestablishing quickly following a wildfire. This tree produces large numbers of cones that wait for the heat of a fire to signal them to open. Although the adult tree may not survive a wildfire, the seeds quickly begin to grow. For residents living in this environment, the ecology of lodgepole provides an important clue for the need for defensible space - lodgepole pines grow densely due to the amount of seeds that establish after a fire event. These dense stands provide a large amount of fuel for the next wildfire that moves through the area.

Ponderosa pine - On the other hand, Ponderosa pine is well adapted to survive surface fires, which often char but usually do not kill mature trees. In addition to open crowns and thick bud scales, ponderosa have thick, relatively inflammable bark. Prior to the 1900s, ponderosa pine stands were kept open by lower intensity surface fires that recurred every 5 to 30 years. Over the last century, the light severity fires that thinned small trees were quickly suppressed, and the effects are visible throughout Central Oregon today. The combined effects of over a century of fire exclusion, logging that removed many overstory pines, historic livestock grazing that removed ground fuels that carried a fire, and climate change have created dense stands with thick understories and ladder fuels. The stands that exist today are susceptible to, and cannot survive, crown fire.



Juniper - Look at a photo of Prineville taken around the turn of the 20th century and you'd be hard-pressed to find a juniper. Unlike the other two trees that adapted to fire, western juniper has adapted to low water conditions. Instead of developing thick bark or large numbers of seeds, juniper develops deep rooting systems designed to take advantage of limited water sources in the high desert. In fact, much of a juniper's first 25 - 50 years is spent developing an underground root system, instead of growing above-ground. As a consequence, it was highly susceptible to the wildfires that moved through the rangelands every 10 to 50 years. Prior to a century of fire suppression, juniper was restricted to rocky areas where wildfire normally didn't burn. Now juniper number in the millions, establishing throughout most of the high desert, consuming significant amounts of water and out-competing many other native species.

Public land managers consider the role that wildfire plays in the environment when planning vegetation and fuels reduction projects. Although one objective may be to reduce ground fuel to protect lives and property in the urban-interface, fuel reduction projects also maintain and improve forest and range health by recycling nutrients, decreasing competition for water and sunlight, and increasing resistance to bugs and disease.

Some activities that improve forest and range health also improve wildlife habitat. Stories about a small bear found burned by a forest fire and a young deer that lost his mother, give rise to the notion that wildfire has direct negative effects on wildlife. While this may be true for the most intense wildfires, low- to moderate-intensity wildfires can benefit wildlife by increasing food supplies, such as native grasses and shrubs, and improving the overall nutrition of the vegetation. In addition, most animals are able to avoid the worst effects of wildfire by moving into burrows, into islands of vegetation not being consumed by the fire, or into lakes and rivers. Overall, although some animals may be injured or killed in any fire event, animals that live in fire prone environments have evolved a variety of adaptations.

The take-home message is that fire is as natural a part of our Central Oregon rangelands and forests as many of the plant and animal species that live there. While we need to recognize and respond to the need to protect human resources, we also need to recognize the vital role that wildfire plays in the environment and try, through technology and fuels management, to find a balance between the two. - Lisa Clark, Fire Mitigation Specialist



Dead and down trees and other vegetation covering the forest floor provide fuel for wildfires.



Mill Creek prescribed burn removed hazardous fuels, reducing the potential for catastrophic wildfire.

What is prescribed fire and why use it?

Prescribed fire is one of many tools land managers use to accomplish ecological objectives such as, removing hazardous fuels, and controlling weeds and other vegetation. Prescribed fires are intentionally set under specific weather conditions so as to alleviate or mitigate any concerns or issues with smoke.

While people value the glow of a candle, or the comforting crackle of a campfire, that relationship doesn't extend to smoke. We may bask in the heat of a fire, but we dodge the smoke that makes us cough and our eyes tear up.

Smoke can affect human health in the form of particulate matter. Wildfires, burning for weeks under summer days can produce a significant amount of smoke. Depending on conditions, smoke can settle in and affect air quality for days. Just ask Sisters area residents - the post summers of large scale fires like the B & B, Cache Mountain, Black Crater and Lake George, left them socked in for weeks. Sometimes it feels like, just when the fire season is over, smoke from prescribed fire fills the air again.

So, why do we burn?

There are several reasons why we use prescribed fire as a land management tool:

- It's a cost-effective way to reduce hazard fuels and lessen wildfire intensity.
- It reduces flame lengths and increases the ability of firefighters to protect homes and lives.
- It maintains and improves ecosystem health by recycling nutrients and decreasing competition for resources like sunlight and water.
- It can also improve wildlife habitat by increasing food supplies such as native grasses, forbs and shrubs.

What about the smoke it creates?

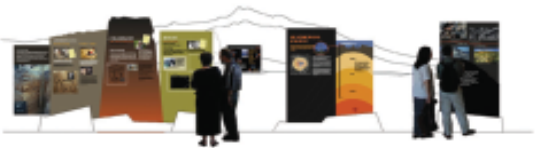
For prescribed burn managers, the goal is always to have prescribed fires burn quickly and cleanly, and for smoke to be carried up and away from the area. Although every effort is made to avoid smoke drifting into neighborhoods, predicting weather patterns and smoke dispersal is not a perfect science. Forecasts, even those received hours before a prescribed burn, can change. For that reason, conditions are watched constantly and many times, scheduled burns are cancelled at the last minute if things aren't right for meeting that goal.

In addition to smoke from local, federal and state projects, smoke may come from a variety of sources such as private field and debris burns, industrial forest operations, and can even drift in from other regions. To avoid being part of the smoke problem, the Forest Service, Bureau of Land Management and Oregon State Department of Forestry, work closely together to plan and carry out prescribed fire projects.

- Lisa Clark, Fire Mitigation Specialist

Experience Today

COMING IN 2008 TO LAVA LANDS
NEW EXHIBIT AND EXPANDED VISITOR CENTER



The new interpretive exhibit opening at the Lava Lands Visitor Center in 2008 explores central Oregon's dramatic history of fiery volcanic eruptions, rises of ice, hundreds of ash, and survival by its tenacious inhabitants.

Designed by Lehrman Cameron Studio of Seattle, the exhibit tells a vivid story of transformation and adaptation, viewed through the lens of geology, climate, ecology, and culture. The landscape of Hellsery National Volcanic Monument is a window into a world that continues to reshape itself as a result of changing climate and volcanic activity.

LEHRMAN CAMERON STUDIO
www.lehrmancameron.com

Exciting Changes to Lava Lands Visitor Center

Lava Lands Visitor Center is being upgraded this summer with a building remodel. A new 1,500 square foot addition to house a lobby, reception area, and gift shop will be completed this summer by architect StastnyBrun of Portland, Oregon. New exhibits will be designed by Lehrman Cameron Studio of Seattle, Washington.

Original construction started in the fall of 2007 and will be completed sometime fall 2008. For the summer of 2007 a temporary visitor center will be located in a trailer in the North parking area of Lava Lands. The center will contain a rock and video display as well as a gift shop. All facilities and programs, including trails on the lava flow, will be available to visitors. Some construction noise may be possible throughout the season but nothing should interfere with our visitors having a wonderful visit to this unique area.

These exciting changes that are coming to the visitor center will be the first in over 30 years. The interpretive themes of the new exhibits showcase the interconnections between the geology, ecology, climate, and culture of Central Oregon. The grand opening will be held during the summer of 2008 at Lava Lands Visitor Center when the new exhibits and remodel are complete.

- Jennifer Winston, Interpretive Services

Rockhounding in Central Oregon!!

Over the past 50 years, rockhounding in the Ochoco Mountains and central Oregon has been a popular activity for visitors from all over the western United States. Currently 1/3 of the visitor inquiries to the Chamber are about rockhounding. It is the 5th major attraction in the county.

Recently the Prineville District BLM, Prineville-Crook County Chamber of Commerce and the Ochoco National Forest/Crooked River National Grassland joined forces to update the 1969 Rockhound Map. In 1969, family rockhounding outings were popular. They still are today.

When the Earth formed, the geology of the central Oregon area resulted in a wide variety of rock types in a relatively small area. Crook County is known to many as the rockhound capital of the world.

Central Oregon has been shaped by numerous and varied volcanic events that began millions of years ago and continue to the present. A chain of volcanoes in eastern Oregon began erupting about 50 million years ago during a time of tropical climate conditions that supported lush woodlands. The volcanic and sedimentary rocks from these volcanoes are known as the Clarno Formation. During this time period, ash on steep slopes of volcanoes frequently mixed with tropical rains and produced large-scale mudflows that swept across the landscape, entombing plants and animals, preserving them as fossils. Entombed trees and wood debris became much of the petrified wood that rockhounds in central Oregon collect today.

During past volcanic activity, superheated groundwater circulated through the rocks, filling the cracks and voids with quartz, calcite, cinnabar, and other minerals. Today the Clarno and John Day formations are highly eroded, exposing many different rock layers rich with semi-precious gems, creating a paradise for rockhounds. Many members of the quartz family of semiprecious gemstones are represented in these deposits including crystalline quartz, amethyst (rare), and various types of chalcedony such as agate and jasper. A particular favorite of rockhounds are the agate-filled nodules known as thunder eggs, the Oregon state rock.

There are areas that are free for the public to access in search of agate, jasper, limb cast, petrified wood, obsidian, moss, dendrite and angel wing. These areas are managed by the Bureau of Land Management and the Ochoco National Forest. Rockhound collections sites are for personal use only, not for commercial resale.

- Carrie Gordon, Forest Geologist and Ryan Franklin, BLM Geologist



Cut and polished thunderegg



In 1969 Rockhounding was a popular family outing and still is today.

Northwest Interpretive Association

Northwest Interpretive Association (NWIA) is a nonprofit organization dedicated to promoting the discovery of northwest public lands, enriching the experience of visitors, and building community stewardship of these special places today and for generations to come.

Visit NWIA bookstores throughout the Deschutes and Ochoco National Forests at Lava Lands Visitor Center, Bend/Fort Rock Ranger District, Crescent Range District, Deschutes National Forest Supervisor's Office, Sisters Ranger District, and Ochoco National Forest Supervisor's Office.

Proceeds from retail operations are used to fund educational programs, publications, exhibits, speakers, and other services designed to enhance your appreciation of the area.

Become a member of NWIA and receive a 15% discount at NWIA sales outlets at public lands throughout the Northwest (excludes passes, native crafts, and buying for resale purposes).

For more information, please visit our website at www.nwpubliclands.org or contact us at Northwest Interpretive Association, 164 S Jackson Street, Seattle, WA 98104



For more information on Rockhounding, visit our website at:
www.fs.fed.us/r6/centraloregon/recreation/rockhounding/index.shtml

The Prineville District BLM, Prineville-Crook County Chamber of Commerce and Ochoco National Forest, in partnership, published the revised Central Oregon Rockhounding Map in August, 2004. To purchase the rockhound map or for additional information on the Central Oregon area, contact the following offices.



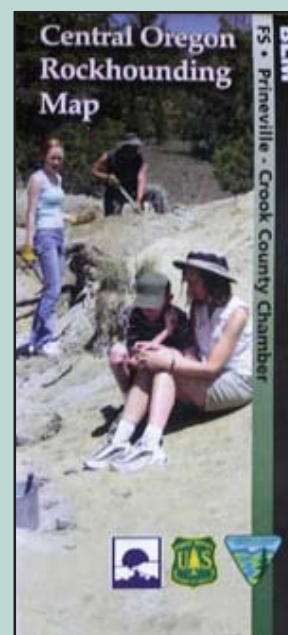
Prineville-Crook County Chamber of Commerce,
390 NE Fairview, Prineville, Oregon 97754;
(541) 447-6304 www.prineville-crookcounty.org



Bureau of Land Management
3050 NE Third Street, Prineville, Oregon 97754
(541) 416-6700 www.or.blm.gov/Prineville



Ochoco National Forest
3160 NE Third Street, Prineville, Oregon 97754
(541) 416-6500 www.fs.fed.us/r6/centraloregon



Discover the Natural World

Crooked River National Grassland Rangeland Restoration

Native Basin Wildrye Restoration Planting

March 2006, Forest Service contractors planted 50,000 native basin wildrye grass plugs on approximately 130 acres of the Crooked River National Grassland near Madras. Plant survival monitoring will occur early summer of 2007. This project is part of the habitat restoration activities that include restoration of Grassland areas that no longer support healthy sagebrush steppe habitat.

Basin wildrye is the largest perennial bunchgrass native to the western United States. Bunches are two to four feet in diameter and up to eight feet tall with an extensive, soil-binding fibrous root system. Dense stands of basin wildrye are resistant to many aggressive, non-native weeds that can invade native plant communities. In Oregon, basin wildrye is found from the Deschutes River drainage to the Idaho border. An early to late-succession species suited to deep bottomland soils in dry (5-20" precipitation) zones, it is regarded as a primary restoration species on altered range sites that once supported stands of this grass. It provides habitat for a variety of wildlife species with deer, birds, and small mammals using dense wildrye stands for hiding, nesting, and feeding.

Native Americans used basin wildrye for medicinal purposes, fiber for mats and bedding, food preparation and storage, and winter forage for horses. On bottomland areas, basin wildrye was historically a dominant plant community that thrived under natural fire regimes. Many of these sites had thick stands of this grass when settlement began. Overgrazing and conversion of bottomlands to crop production led to the decline of basin wildrye communities.

Crooked River National Grassland Sagebrush Habitat Restoration

The basin wildrye planting is part of a larger ten year project to maintain and enhance sagebrush steppe plant communities on the Grassland. Approximately 8,000 acres of abandoned farmland will be seeded with native grasses and forbs. Bitterbrush seed has also been collected on the Grassland, and plants will be grown for restoration plantings. The intent of the project is to improve vegetative diversity and wildlife habitat by establishing deep-rooted perennial grasses, forbs, and shrubs in areas that are currently dominated by non-native grasses such as cheatgrass and crested wheatgrass.



Also planned is 50,000 acres of sagebrush steppe plant community enhancement by reducing the density and distribution of western juniper to pre-settlement levels. Since settlement, juniper density has increased, resulting in loss of this habitat. Chainsaw cutting and prescribed burning will be used. Enhancement of sagebrush steppe plant communities will result in accumulations of organic matter and establishment of native grass species to provide habitat for ground nesting birds including California quail, meadowlark, horned lark, the burrowing owl and sage grouse. The project is also expected to maintain and enhance habitat for antelope and mule deer.

The basin wildrye project was initiated following a successful demonstration project in which 3,000 wildrye plugs were planted on the Grassland in 2004. Planting was completed by volunteers from local chapters of the Native Plant Society of Oregon and the Oregon Hunter's Association.

- Mark Lesko, Botanist, Crooked River National Grassland

For more information, please contact Steve Gibson, Range Conservationist, Crooked River National Grassland in Madras, 541-416-6440, or Mark Lesko, Lookout Mt. RD and Crooked River National Grassland Botanist, at the Ochoco NF office in Prineville, 541-416-6416.

Related links:

<http://www.fs.fed.us/r6/centraloregon/projects/units/crooked/grassland-eis/deis-summary.shtml>

<http://www.usask.ca/agriculture/plantsci/classes/range/elymuscin.html>

<http://www.fs.fed.us/database/feis/plants/graminoid/leycin/LIFE%20FORM>

Magical Springs

Have you ever observed water gushing up out of the earth and wondered where it came from? Well, you are not alone. Until the 17th century, western world scientists speculated that spring water must originate from water condensing below the earth's surface or from the ocean that somehow flows uphill. Researchers would later discover that precipitation is the answer to where the water came from.

The Upper Deschutes River Basin is unique because stream flow is mostly from groundwater sources rather than surface run-off. Browns Creek, Cultus River, Snow Creek, Fall River, Spring River are some of the springs that join together to form the Upper Deschutes River. These spring-dominated tributaries create one of the most stable flow regimes in the United States, varying little monthly or annually. The most unique characteristic of these springs is that their flow increases instead of decreases during the summer, despite the minimal amount of rainfall.

Where does the water that supplies these spring-fed streams come from? The answer lies to the west in the Cascade Mountains where springs pierce the earth's surface. Abundant precipitation, up to 200 inches annually primarily in the form of snowfall, provides this source of spring water. A relatively young and highly permeable volcanic landscape acts as a giant sponge, easily absorbing snowmelt and rainfall through fissures and fractures. After descending and then flowing in an easterly direction, the groundwater will eventually emerge through a crack in the ground to form a spring. Depending upon the spring, it can take 9 months to several years for this entire process to occur.

Filtered through the volcanic sub-surface, the clear, cool water supplied by the springs provides excellent trout habitat and is a major contributor to Bend's drinking water supply. This spring-fed system is among the highest quality surface water in the United States. Next time you drink water in Bend, think of the journey the water took through mountains and volcanic landscape to reach you. -

Tom Walker, Fisheries Biologist



Naturescaping

Collecting wild plants is allowed on some public lands, with a permit. Call your local Forest Service office to find out which plants can be collected and where.



Restoring Forest Health

Everyone Pays for Vandalism

Each year thousands and thousands of your tax dollars, that could be spent on improving your recreational opportunities, are instead spent repairing damage caused by vandalism.

Last year, employees of the Deschutes National Forest spent time and money removing graffiti from cave walls; removing illegally dumped garbage, abandoned vehicles and appliances; and repairing damage to cultural resources. If you see vandalism occurring - please report it!

Discover the Natural World

The Deschutes, Metolius and Crooked Rivers

Deschutes River

Source: Cascade Range near Mt. Bachelor. The Deschutes begins as outflow from Little Lava Lake, flows into Crane Prairie and Wickiup reservoirs...tumbles through the high desert ending at the confluence with the Columbia about 15 miles east of The Dalles.

Wildlife: Deer, elk, eagles, osprey, hawks, heron, waterfowl, mink, otter, beaver, bear.

Fish: Coho and kokanee salmon, sculpin, mountain whitefish, rainbow, bull, and brown trout.

Flora: Wildflowers in Central Oregon bloom along rivers first. Like many riparian (near water) zones the banks of the Deschutes are beautiful and in danger of being trampled by love. Much effort is going into repairing damage caused by years of use. Someone you know may be volunteering their time to help. You can help by respecting restoration projects, staying on designated trails and leaving no trace of your visit.

Fun: Whitewater rafting - outfitter guides offer 1, 2 or 3 day trips. Canoeing - Wickiup Reservoir to Benham Falls, with a portage around Pringle Falls, is a favorite stretch AND kayaking, fishing, mountain biking, hiking, horseback riding, and boating are all favorite pastimes. Rentals are available for most of the activities listed - check the phone book.

Crooked River

Source: The North Fork starts at Sierra Springs and the South Fork heads from numerous springs between Snow Mountain, Hampton Buttes and the Glass Butte drainages. The river joins the Deschutes and Metolius rivers at Lake Billy Chinook. The river also passes through Smith Rock State Park.

Wildlife: Deer, elk, eagles, osprey, snakes and small mammals.

Fish: Red-band trout, bridge-tip sucker, dace, three types of sculpin, and northern pike minnow.

Flora: Like postcards from the last century, open, park-like stands of ponderosa pine shade the upper Metolius - remnants of quiet forests that once stretched from mountainside to desert fringe. Wildflowers and other plant life seem to grow along the banks as if joy were fertilizer. Rare beauty requires strong stewardship. Stay on designated trails, leave no trace of your visit and take only photos and memories home.

Metolius River

Source: The Metolius "bursts" out of the ground along the base of Black Butte near Sisters. It picks up volume from a series of springs, runs north around "Metolius Horn" and quickly ends its cold, clear journey in Lake Billy Chinook about 30 miles from the source.

Wildlife: See Deschutes above.

Fish: The river is about 50 feet wide, 50 degrees Fahrenheit and drops about 35 feet per mile. The steady flow and constant chilly temperature makes it unique among Oregon rivers and prime habitat for the rare bull trout. Water quality is exceptional. Native species - chinook and sockeye salmon, rainbow and bull trout, mountain whitefish. Introduced species - brown and brook trout, kokanee salmon.

Flora: Like postcards from the last century, open, park-like stands of ponderosa pine shade the upper Metolius - remnants of quiet forests that once stretched from mountainside to desert fringe. Wildflowers and other plant life seem to grow along the banks as if joy were fertilizer. Rare beauty requires strong stewardship. Stay on designated trails, leave no trace of your visit & take only photos and memories home.



Photo courtesy of Dennis Lipscomb.



Metolius River

The Hordes Have Arrived and They are Green!

They come at us like Genghis Khan and his hordes, haranguing us on our highways, whipping at our waterways, traipsing along our trails. They do millions of dollars of damage and devour 4,600 acres of countryside each year in the western public lands.

This "army" metaphor describes the march of unwanted, non-native plants into our public (and private) lands; and they have insinuated their way into Central Oregon's natural beauty, into the ponderosa pine forests, along our most popular lakes and rivers, and into our grasslands.

These plants are called exotics for good reason: they hail from such far-flung places as the Mediterranean, Europe, and the steppes of Asia. They have names like spotted knapweed, dalmation toadflax, and houndstongue, and collectively, carry an array of weapons that can dramatically alter the way our native ecosystems work. Their arsenal includes chemicals that prevent other plants from getting established nearby; seeds that get a jump-start on native plants by germinating sooner; producing a higher number of seeds per plant and a higher number of seeds that will germinate; and can remain viable as seeds in the soil for many years. In these ways, they make it harder for our native plants to compete with them.

There are other ways invasive plants wreak havoc upon our lands. Besides displacing native plants, they also reduce the diversity and quality of forage for wildlife and livestock, threaten rare plant habitats, and can increase the frequency of wildfires.

To view a map of the majority of the weed outbreaks in Central Oregon is to view a map of the major road system. Essentially anywhere a vehicle (including passenger vehicles, off-road vehicles, and heavy machinery) can go, it is possible to have a weed population present. These plants trespass into our forests using the road system as a major pathway, with vehicles as their main vector; their seeds hitch rides on tires or their stems with seeds are caught on undercarriages and taken along to colonize new sites.

Despite the gloomy picture just painted, there is much to cheer about in the wildland weed war. With the help of many volunteers, public land managers organize weed pulls, clip seed heads, put "biocontrol" agents (natural insect enemies) onto weed populations, arrange for herbicide spraying on certain sites, and support and participate in local weed boards and other partnerships.

For more information on weeds, and what you can do to help keep areas weed-free, local Forest Service and Bureau of Land Management offices should have brochures and information. There are also many weed sites on the world wide web. - *Charmane Powers, Ecologist/Botanist*

Want more information?

Contact any public agencies mentioned or visit many weed sites on the world wide web.

Local weed info in Deschutes County, Oregon - www.co.deschutes.or.us

Center for Invasive Plant Management - www.weedcenter.org

Plant Conservation Alliance - www.nps.gov/plants/alien

www.egov.oregon.gov/ODA/PLANT/; www.invasivespecies.gov



Wildlife on the Web... Are you ready to explore the natural world around you? The Central Oregon Wildlife Viewing Website makes it easy and fun! Explore your wildlife viewing options, print a customized guide, then get outside! Local wildlife biologists are available online to answer your questions. Visit www.fs.fed.us/r6/centraloregon/wildlife/index.shtml



Artwork by Dennis McGregor

Learn in the Kids' Corner



Putting the Fire Out...COLD!

Driving the Cascade Lakes Scenic Byway, you think back on the past year and how much you've looked forward to this vacation. Two weeks in the Cascade Mountains of Central Oregon where you and your family plan to hike, swim, bike and gaze at the stars after the kids are tucked into their sleeping bags for the night. You plan on camping, though you're not sure where. There are so many great campsites along the lakes, streams and high elevation meadows. The family car is

loaded with camping equipment, tons of food, and you haven't forgotten the shovel and bucket for the campfire that everyone is looking forward to. After all, a campfire is one thing we all remember from family camping trips and to not have one is, well, no fun at all.

Every year campfires left unattended and abandoned have the potential of costing millions of dollars in suppression and lost resources. Here on the Deschutes National Forest, abandoned campfires are the number one cause of

human caused fires. Most of these abandoned campfires stay small and very easy for firefighters to suppress but it only takes one escaping fire to jeopardize lives, destroy property and change a beautiful area forever.

Here are some simple steps to help you properly build and extinguish a campfire. (See Renee's illustrations)

Welcome to Central Oregon! Enjoy the beauty and wonder of our area and remember: "Put it Out, Dead Out!"

- Cathy O'Brien, Fire Prevention Officer

Building a Fire...

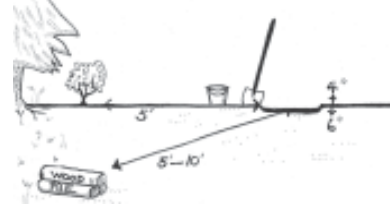


Check before you go.
For campfire restrictions
Call: 1-800-523-4737 or
Visit: www.fs.fed.us/r6/centraloregon/fire

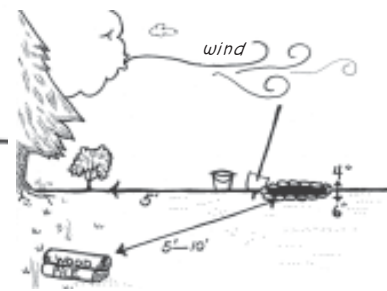


Make sure you have a shovel and water very close by

Choose a level area with no overhanging branches



Dig a 4" to 6" pit
Clear away all vegetation, including pine needles



Circle pit with rocks
Pile firewood up wind and 10 feet from pit

Keep fire small & manageable
Keep fire contained inside fire pit
NEVER leave a campfire unattended, no matter how small



Putting the Fire Out...Cold



Slowly add water to put out all flames



Scatter, scrape, and separate



Add more water until the steaming stops



Feel for heat



Feel to make sure fire is out **COLD!**

Illustrations - Renee Lamoreaux, Fire Prevention Officer

Can You Track an Animal?

Draw a line from the animal to the track it would leave.

| | | |
|----|----|----|
| A. | 1. | 2. |
| B. | 3. | 4. |
| C. | 5. | 6. |
| D. | 7. | |

What's an "Unhuggable"?

Unhuggables are any animal that has a bad reputation. It might be a spider, toad, or even a mole. Basically, it's just an animal that doesn't have a lot of friends. But just because you don't like an animal, that doesn't mean it's not important. We need unhuggables too!

Who Am I?

See if you can guess what this "unhuggable" animal is.

- I can catch and eat up to 600 mosquitoes an hour.
- Females of my kind usually have one baby a year.
- I may live to be 32 years old.
- I'm very clean.
- I can fly at heights of 2 miles at up to 60 miles per hour
- Some of my kind eat scorpions (but we spit out their tails)
- I fly by flapping my fingers.
- I'm not blind.

I'm a: _____

I Spy, You Spy: Scout It Out...

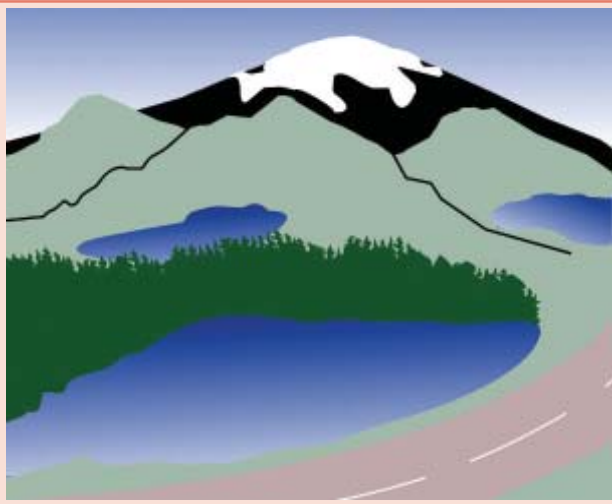
Cross these off as you see them in or around the Lava Lands Visitor Center.

| | | |
|--|--|--|
| | | |
| | | |
| | | |

ANSWERS--Tracks: A-6; B-7; C-4; D-3; E-1; F-2; G-5; Who am I? BAT

Take the Road Less Traveled

Scenic Byways are a way of getting in touch with the pulse of the communities and cultures of central Oregon. Traveling the three National Scenic Byways on the Deschutes National Forest will bring you face to face with incredible scenery and fascinating stories about people of the past. Each byway offers opportunities to learn about Native American lifestyles and their history, early explorers and trappers traveling through as yet unmapped territory, homesteaders eking out a living on the high desert, and loggers, farmers, and miners changing the look of the landscape.



The Cascade Lakes National Scenic Byway is our “String of Pearls.” This 66 mile drive takes you closer to the sky as you drive through Cascade peaks and alpine lakes. The air has an entirely different feel up here. You follow the journey of water from its icy origins to springs, streams, rivers, and lakes that have transformed the volcanic landscape into meadows, wildflower carpets, and mixed conifer forests.

Selected by Scenic America as one of the nation’s 10 most important byways, this route offers many opportunities for experiencing the outdoors in a wilderness setting, places to watch wildlife, open spaces for hiking and biking, a variety of lakes for fishing and boating, and special interpretive sites and trails designed for learning more about this incredible environment.

The Ray Atkeson Wayside tells you about Oregon’s photographer laureate who used photography as a way to create awareness for the preservation of Oregon’s scenic beauty. The Soda Creek Interpretive Site will teach you about how a creek was restored from a straight channel to its natural meanderings. The new Wickiup Dam Interpretive Site will describe Oregon’s last big log drive and the construction of the dam.

To access the Cascade Lakes Scenic Byway, follow signs through Bend to Mt. Bachelor and the Cascade Lakes. Return north to Bend via Highway 97 or by crossing the Deschutes and Little Deschutes rivers on Forest Road 42. The best time to take this drive is between June and October. Minimum driving time is 3 to 5 hours. This drive is closed during winter beyond Mt. Bachelor to south of Davis Lake.



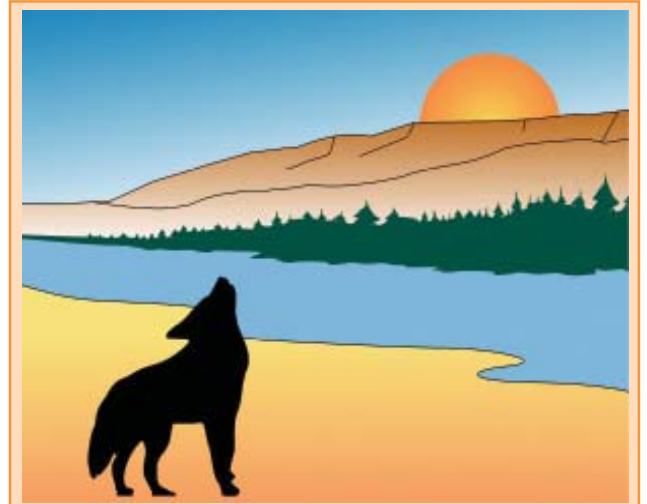
The McKenzie Pass-Santiam Pass National Scenic Byway starts in Sisters and quickly climbs two passes while carving through 82 miles of jagged lava landscapes suddenly softened by lush forests and sheltering trees. This dramatic byway follows an 1860s wagon road. Brilliant views of contrasting dark and light are offered over a foreground of lava and a backdrop of the magnificent North and Middle Sisters. The hidden South Sister is visible from the Cascade Lakes National Scenic Byway to the south.

The stark contrasts between fire and ice give way to a softer textured environment as you drive through old growth forests and the gentler west side understory of vine maple and other deciduous vegetation. A pause at Proxy Falls will take you to fern covered hillsides and a beautiful display of cascading water. A short hike to Linton Lake is worth the refreshing view. Native American stories and pioneer history await you at Dee Wright Observatory, Sahalie Falls, Koosah Falls, and the new scenic byway portal at the McKenzie Ranger District.

You can catch this rush of a ride by heading west on Oregon Route 242 after slowly making your way through the town of Sisters. The loop drive will take you up to McKenzie Pass for some challenging driving, along the McKenzie River on Oregon 126, over the Santiam Pass, past Suttle Lake and Black Butte Resort, and then back to Sisters. The best time to take this drive is between July and October as McKenzie Pass is closed during winter. Minimum driving time is 3 to 5 hours.



Cascade Lakes, McKenzie Pass-Santiam Pass and Outback National Scenic Byway maps courtesy of www.byways.org. Visit their website for more information.



The Outback National Scenic Byway, with its “Sounds and Colors of Silence,” is a 171 mile drive that takes you through remote small towns with tall tales as reminders of the not too distant past. This is a place where silence is transformed into pearls of wisdom and living history through the stories told by volunteers at Fort Rock Homestead Village Museum. There are several homestead-era structures which were moved from their original locations to be preserved and protected at the museum site. Visiting the cabins, school house, and church will help you appreciate the lifestyle of these homesteaders who settled the area in the early 1900s.

The geology and history of this remote expanse of rimrock and sage await discovery one mile away at Fort Rock State Park. The fortress-like rock formation that rises above the sagebrush plains is an unforgettable sight.

Summer Lake is a wildlife area that is part of the Pacific Flyway where waterfowl can be viewed. Silver Lake is less of a lake now than a dry basin. Scattered throughout the desert are hot springs. There is an attractive rest area at Summer Lake halfway between Highway 97 and Highway 395. Lakeview is the “tallest town” in the state at 4,800 feet with Oregon’s only geyser Old Perpetual shooting 60 feet in the air every minute or so.

To find the Outback Scenic Byway, drive 33 miles south of Bend on Highway 97 to the junction 2 miles south of LaPine and then turn southeast on Oregon 31. Fort Rock Homestead Village Museum and Fort Rock State Park are 30 miles south on Oregon 31 and 7 miles east to the town of Fort Rock. The best time to enjoy this drive is spring and fall. Minimum driving time is 3 to 4 hours.



Get High on Nature!

2007 Visitor Center Hours & Interpretive Program Schedule

Lava Lands Visitor Center, Lava Butte and Lava River Cave

When: May 2– June 30*, Wednesday – Sunday, 9:00 to 5:00
 July 1–Sep16, 7 days a week, 9:00–5:00
 Sept. 17–Oct 14, Wednesday – Sunday, 9:00–5:00

Interpretive programs are offered June 27 to September 10 at Lava Lands Visitor Center. Check at the information desk for current schedule. Lava River Cave is a self-guided exploration of a mile-long lava tube. Lantern rentals available for \$3.

Interpretive Programs

When: June 27–September 10

Where: Lava Lands Visitor Center

Mount Bachelor–Pine Marten Lodge

Newberry Caldera–various locations

Cascades Lakes Highway–various campgrounds

Inn at the 7th Mountain

Interpretive and educational program schedules will be posted at entrance stations, information desks, and campground bulletin boards. Please check the weekly schedule for times and locations throughout the summer.

Passport in Time (PIT) Projects

Pack your bags and head out but don't forget your Passport in Time (PIT). As part of a PIT crew, you work alongside archaeologists and historians on all sorts of projects. Archaeology digs, restoring historic structures and recording oral histories are a few possibilities. There is no fee to become a PIT partner. Is your local National Forest sponsoring a PIT project this summer? Call the Supervisors Office of any National Forest and ask for the *PIT Traveler*, the Passport In Time newsletter, or write to: Passport In Time Clearinghouse, PO Box 31315, Tuscon, AZ, 85751-1315 or visit our web site at: www.passportintime.com

Historic Elk Lake Guard Station

June 13 through Sept 12, 9:30 am –4:30 pm

Visitor information and historic site interpretation. Tour the station log cabin and grounds to see how Forest Service guards lived in the 1930s and 1940s. Hiking Trail connects guard station to Elk Lake campground and resort.

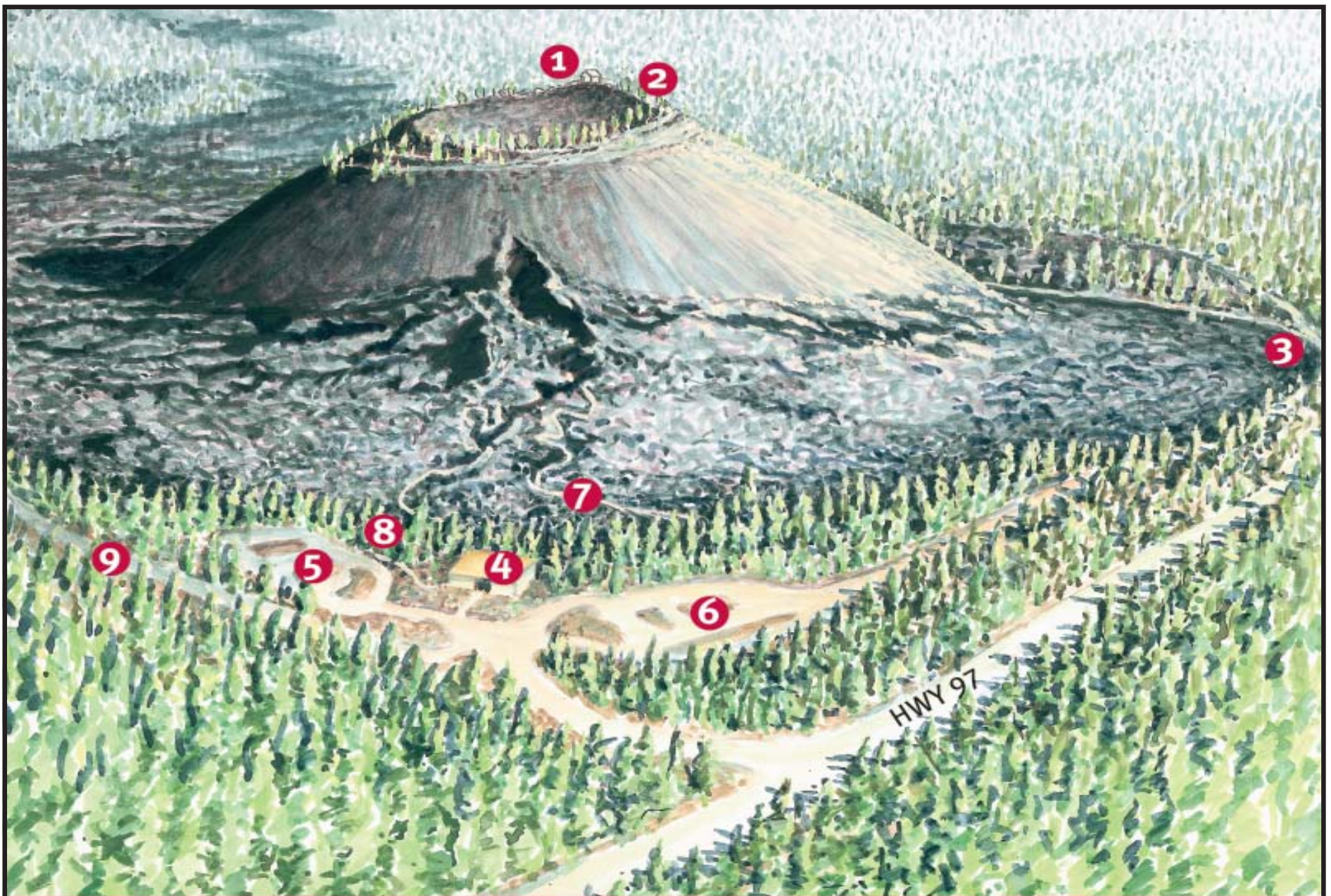
Redmond Air Center

Redmond Air Center is a hub for wildfire suppression and fire-related aviation activities for the Pacific Northwest region. Located 2 miles east of Redmond at the north end of the Redmond Airport, the facilities are open for public tours Monday thru Friday from 9:00 to 10:30 a.m. and 1:00 to 3:00 p.m. Visitors may tour the Redmond Smokejumper Base, the National Interagency Incident Support Cache, and the Redmond Air Tanker Base during the operating season. Please schedule tours in advance by calling the Center at (541) 504-7200 especially during the busy May through September fire season.

High Desert Museum


Through exhibits, wildlife, and living history, the High Desert Museum creates learning experiences to help audiences discover their connection to the past, their role in the present, and their responsibility to the future. The museum is open daily from 9:00 to 5:00. For more information and rates please call 382-4754 or visit their website at highdesertmuseum.org.

Newberry National Volcanic Monument - Lava Lands Visitor Map



- | | | |
|----------------------|-------------------|-------------------------------|
| 1 Lava Butte Lookout | 4 Visitor Center | 7 Trail of Molten Land |
| 2 Crater Rim Trail | 5 Visitor Parking | 8 Whispering Pines Trail |
| 3 Lava Butte Road | 6 RV Parking | 9 To Benham Falls Picnic Area |

Artist: Dennis McGregor

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