



## Reflections Visitor Guide



### Welcome!

Thank you for visiting your national park! Here at Crater Lake, you'll find opportunities to refresh your spirit, awaken your senses, and connect with the natural world. In this age of economic uncertainty, I know that your time and money are more precious than ever. On behalf of our staff, I promise we'll do our best to ensure that your enjoyment of the park exceeds your investment in traveling here.

Although Crater Lake was born from an event of great violence and fury, today the park is notable for its peace, quiet, and tranquility. As stewards of this special place, we are tasked with protecting not only its landscape but also its "soundscape." This summer we will begin a two-year acoustic monitoring project that will measure the volume and frequency of sounds—both natural and of human origin—produced throughout the park.

Data from this project will help us make informed decisions when evaluating human impacts to the park's soundscape. Maintaining "natural quiet" in our parks is a topic of great interest as demonstrated by public concern last summer over a proposal for helicopter tours at Crater Lake. In response, Congress is considering changes that would keep the FAA responsible for air tour safety but would allow decisions on impacts and authorizing tours to be made by the park.

In other news, this summer we will join eight other national parks to study the vulnerability of the American pika to climate change. Pikas are small animals, related to rabbits, that live on high-elevation rocky slopes and are intolerant of warm weather. We will be studying their distribution, genetic diversity, and habitat requirements in order to help protect them from extinction under a warming climate.

The National Park Service protects nearly 400 special places, saved by the American people so that everyone can experience our heritage. We at Crater Lake are proud to be stewards of this national treasure. Park rangers and maintenance staff are here to assist you in making your visit safe, rewarding, and fun. If there is anything we can do to help, please ask. Enjoy your park!

Craig Ackerman  
Superintendent

## Hop Aboard a Trolley Tour Plus 10 Other Ways to Enjoy Your Park

Crater Lake's Rim Drive is one of the most scenic roads in America, but it's hard to enjoy the views with your eyes on the road. Fortunately, starting this summer, you can choose to leave the driving to someone else! Ranger-guided trolley tours are scheduled to circle Crater Lake daily from July 2 through October 17. Tours will begin and end at Rim Village, spend 2 hours traveling clockwise on the 33-mile (53-km) Rim Drive, and stop along the way at a minimum of 4 scenic overlooks. See page 3 for departure times and ticket information.



The trolley buses are fully enclosed, climate-controlled, and wheelchair accessible. They seat approximately 25 passengers and are elegantly styled to resemble vintage streetcars, with an interior of hand-finished wood and polished brass. They may look old-fashioned, but they run on modern-day technology and are powered by compressed natural gas, providing a 30 to 40% reduction in greenhouse gas emissions compared with gasoline- and diesel-powered vehicles. The trolleys are owned and operated by The Shuttle Inc. of Klamath Falls, Oregon. For more information, visit [www.craterlaketrolley.com](http://www.craterlaketrolley.com). Here are 10 additional ways to make your visit to Crater Lake meaningful, memorable, and fun:

### Drive Around the Lake

Rim Drive is a 33-mile (53-km) road that encircles Crater Lake. More than 30 pullouts offer dramatic views of the park's volcanic scenery. Allow 2 to 3 hours (*see page 5*).

### Hike a Trail

From easy walks to challenging hikes, the park has something for everyone. Explore pristine forests, flower-filled meadows, and rocky peaks (*see page 4*).

### Attend a Ranger Program

Discover the wonders of Crater Lake with those who know the park best. Talks, hikes, kids programs, evening programs, and boat tours are offered daily (*see page 3*).

### Watch the Park Film

The park's rich human history is the topic of an 18-minute film shown throughout the day at the Steel Visitor Center. Learn how the lake has affected those who've seen it (*see page 2*).

### Visit the Pinnacles

Formed during the same eruption that gave birth to the lake, these colorful volcanic spires are tucked away in the park's southeast corner (*see page 5*).

### Tour Crater Lake Lodge

For a glimpse into an earlier era, check out the history exhibits—and walk through the Great Hall—of Crater Lake Lodge, renovated in the 1990s but first opened in 1915 (*see page 2*).

### Visit the Sinnott Memorial Overlook

With panoramic views and fascinating exhibits, this is the place to learn about the park's geologic story and history of scientific investigation (*see page 2*).

### Touch the Water

The trail to the lake shore is steep, dusty, and often crowded, but the water at the bottom is some of the world's purest. Swim, fish, or simply dangle your toes (*see page 3*).

### Relax

Find a peaceful spot and attune yourself to the sounds and rhythms of the park. The Lodge veranda and the quiet pullouts on the lake's north side are favorite spots to unwind.

### Gaze at the Sky

With clean air and unobstructed views, Crater Lake is a great place to watch the sun go down, the moon rise up, and the stars twinkle in the sky (*see page 3*).

- 2... Camping, Lodging, Food
- 3... Ranger Programs
- 4... Hiking Trails
- 5... Park Map
- 6... Park Weather
- 7... In the News: Crayfish
- 8... Recommended Reading

Look Inside! →

### Park Profile

Crater Lake National Park protects the deepest lake in the United States. Fed by rain and snow (but no rivers or streams), the lake is considered to be the cleanest large body of water in the world. The water is exceptional for its clarity and intense blue color.

The lake rests inside a caldera formed approximately 7,700 years ago when a 12,000-foot-tall (3,600-meter) volcano collapsed following a major eruption. The eruption may have been the largest in North America in the past 640,000 years. Later eruptions formed Wizard Island, a cinder cone near the southwest shore.

Today, old-growth forests and open meadows blanket the volcano's outer slopes, harboring a variety of plants and animals, including several rare species. The area is central to the cultural traditions of local American Indian tribes, and the park provides unique opportunities for scientific study and public enjoyment.

- Park established: 1902
- Size: 183,000 acres (74,060 hectares)
- Visitors per year: About 500,000

- Lake depth: 1,943 feet (592 meters)
- Lake width: 4.5 to 6 miles (7 to 10 km)

- Annual snowfall: 44 feet (13.3 meters)
- Last time the lake froze over: 1949



Artist Paul Rockwood's conception of Mount Mazama, the volcano that collapsed to form Crater Lake. If you gathered up the ash from Mount Mazama's catastrophic eruption and spread it evenly across the state of Oregon, it would form a layer 8 inches (20 cm) thick.



Snow plow  
at Rim Village


### When is the Park Open?

Crater Lake National Park is open year-round, 24 hours a day. Some roads, trails, and facilities, however, are closed seasonally due to snow. Much of the year, the park's North Entrance Road and Rim Drive are closed to cars. They close with the first significant snowfall, typically in late October or early November.

Crews begin plowing these roads in April, but opening dates vary. The North Entrance Road and West Rim Drive tend to open in early June. The East Rim Drive typically opens in early July. Highway 62 is open year-round. The road to Rim Village is also open year-round, except after heavy snowstorms.



**National Park Service**  
U.S. Dept. of the Interior



**Crater Lake Visitor Guide**  
Summer/Fall 2010

This is the official trip-planner and newspaper of Crater Lake National Park. It is published twice a year and funded by the Crater Lake Natural History Association through sales made in the visitor center bookstores. Look for the winter/spring 2010-2011 edition in November of 2010.


**Editor**  
Dave Grimes

**Park Mailing Address**  
Crater Lake National Park  
P.O. Box 7  
Crater Lake, OR 97604

**Phone Number**  
541-594-3000

**Website**  
www.nps.gov/crla

**E-Mail Address**  
crla\_information\_requests@nps.gov

 Printed on recycled paper (70% recycled material). Please recycle again.



Photographer on Watchman Peak



Rim Visitor Center



Exhibits at the Sinnott Memorial Overlook



Bicyclist on East Rim Drive



Boat tour on Crater Lake



Sunset over Crater Lake

# Services & Facilities

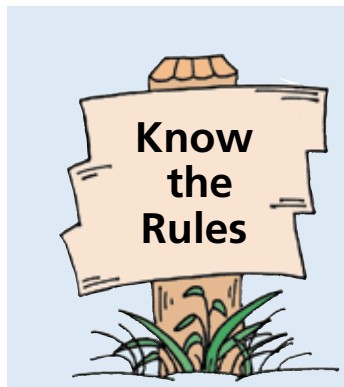
## Camping

There are two campgrounds in the park. Both are situated in forests south of the lake.

**Mazama Campground** (213 sites) is located 7 miles south of Rim Village near Highway 62. In 2010, it will be open from June 11 through September 26. Three-fourths of the campsites are reservable in advance by calling 1-888-774-2728. The rest are available on a first-come, first-served basis. Generally there are plenty of sites available; the campground sometimes fills on weekends, but rarely before 5:00 p.m. There are tent sites (\$21 per night) as well as RV sites (\$27). Some of the RV sites have electric hookups. There are many pull-through sites; some can accommodate RVs as long as 50 feet (15 meters).

Each site has a picnic table, fire ring, and food locker. Black bears are rarely spotted, but campers are advised to store all food in their locker or in their vehicle. The campground has running water, sinks, and flush toilets. There are coin-operated showers and laundry facilities. The nearby general store sells groceries, firewood, and gasoline. You can contact the campground directly during the summer at 541-594-2255 ext. 3610. Mazama Campground is operated by the park's concessioner, Xanterra Parks & Resorts.

**Lost Creek Campground** (16 sites) is for tent-camping only (\$10 per night). It is located on the spur road to the Pinnacles Overlook. It is generally open from early July through early October, depending on snow conditions. Registration is self-service, and reservations are not taken. The campground tends to fill on weekends, but usually not before mid-afternoon. It offers running water, sinks, and flush toilets. Each site has a picnic table, fire ring, and food locker. Payment can be made by cash or check. Holders of a Senior Pass or Access Pass receive a 50% discount. Lost Creek Campground is operated by the National Park Service.



Crater Lake National Park belongs to everyone. We all share the responsibility of protecting it. Please take a moment to become familiar with these important regulations.

**Camping**  
Camping is limited to developed campgrounds and some back-country areas. Permits are required for backcountry camping. Permits are free and are available at either visitor center or at the ranger station at Park Headquarters.

**Driving**  
Use pullouts to enjoy the views. Do not stop in the road. Observe posted speed limits, and watch for wildlife, bicyclists, and pedestrians. Off-road travel is prohibited.

**Showers & Laundry**  
Coin-operated showers and laundry machines are available at Mazama Campground.

## Food & Dining

The park has three restaurants and one store.

The **Crater Lake Lodge** dining room offers fine dining in a casual lodge atmosphere. The menu features Northwest cuisine made with Oregon-grown ingredients. Reservations are required for dinner but are not taken for breakfast or lunch. Reservations can be made by calling 541-594-2255 ext. 3217. In 2010, the dining room will be open from May 21 through October 17.

The **Annie Creek Restaurant**, located in Mazama Village, serves hearty meals, buffet-style. The buffet features a selection of entrees, specialty pizzas, soups, salads, and desserts. À la carte items are also available. The restaurant also offers take-out pizza service, an espresso bar, daily buffet breakfasts, optional patio dining, and a cocktail room with entertainment on selected evenings. The restaurant will be open in 2010 from May 28 through September 12. The restaurant is located adjacent to the park's south entrance station, just off Highway 62.

The **Rim Village Café** serves lighter fare including grab-and-go sandwiches, soup, salads, snacks, breakfast pastries, and hot and cold beverages. The café is open year-round.

The **Mazama Village Store** sells groceries, camping supplies, firewood, and gasoline. It will be open in 2010 from May 28 through September 27.

## Lodging

The park has two lodging options. Both are operated by Xanterra Parks & Resorts. For information, call 1-888-774-2728 or visit [www.craterlakelodges.com](http://www.craterlakelodges.com). You can check availability and make reservations online. For a list of accommodations outside the park, ask at a visitor center.

**Crater Lake Lodge** (71 rooms) is located in Rim Village, overlooking the lake. In 2010, it will be open from May 21 through October 17. Reservations are highly recommended well in advance. **The Cabins at Mazama Village** (40 rooms) are located 7 miles south of Rim Village. Operating dates for 2010 are May 28 through September 26.

## Visitor Centers

There are two visitor centers in the park. Rangers are available to answer questions and assist with trip-planning. The Crater Lake Natural History Association sells books, maps, postcards, and other items (see page 8).

The **Steel Visitor Center**, located at Park Headquarters, is open daily from 9:00 a.m. to 5:00 p.m. An 18-minute film is shown throughout the day. It examines the human history of Crater Lake, from the American Indians who witnessed the lake's formation to the prospectors who stumbled across the lake in the 1850s to the citizens who campaigned for the lake's protection in the 1880s.

The **Rim Visitor Center**, located in Rim Village, is open daily from 9:30 a.m. to 5:00 p.m. from June through late September.

## Exhibits

The **Sinnott Memorial Overlook**, perched on a rock ledge behind the Rim Visitor Center, features an enclosed exhibit room and an open parapet with spectacular views of the lake. The overlook contains a relief model and exhibits on the park's geologic story and history of research. The overlook is open daily (weather permitting) from June through October. Hours are 9:30 a.m. to 6:30 p.m. in July and August, 9:30 a.m. to 5:00 p.m. in June and September, and 10:00 a.m. to 4:00 p.m. in October. 20-minute ranger talks are given twice each day from July 2 through September 6. The overlook is located down a steep historic walkway with stairs and is not accessible to people with limited mobility.

**Crater Lake Lodge** features exhibits on the history of tourism in the park and the history and renovation of the lodge. The exhibits are open daily, around-the-clock, from May 21 through October 17. They are located on the ground floor, west of the lobby.

## Gifts & Books

The **Rim Village Gift Shop** is open all year. The **Annie Creek Gift Shop** in Mazama Village is open May 28 through September 12. You can also shop online at [www.craterlakelodges.com/shop/](http://www.craterlakelodges.com/shop/). The park's two visitor centers also sell books and gifts.

# Activities

## Backcountry Camping

Over 95% of the park is managed as wilderness. Although some areas are closed to backcountry camping (for example, there is no camping with a view of the lake), exploring the park's old-growth forests and volcanic landscapes can be a rewarding experience.

All campers not staying in the park's developed campgrounds must obtain a backcountry permit. The only exception is through-hikers on the Pacific Crest Trail, who may instead sign the trail register as they enter the park. Permits are free and are available at either visitor center or at the ranger station at Park Headquarters.

## Bicycling

Bicycling at Crater Lake is allowed on paved roads and on the unpaved Grayback Drive. Bicycles are not allowed on park trails, with one exception: the Pinnacles Trail. Park roads are narrow with few shoulders and considerable automobile traffic. Helmets are

## Sky Gazing

With clean air, clear skies, and unobstructed views, Crater Lake is a great place to observe astronomical and meteorological events. Discovery Point and Cloudcap Overlook are favorite locations to watch the sunrise. For sunsets and moonrises, try Watchman Overlook or hike to the top of Watchman Peak.

## Fishing

Originally, Crater Lake contained no fish. Between 1888 and 1941, however, 6 species were introduced. Today, only 2 types remain: rainbow trout and kokanee salmon. The bottom of the Cleetwood Cove Trail provides about .25 miles (0.4 km) of rocky shoreline for angling. Wizard Island, accessible via a boat tour, is also open to fishing.

Fishing licenses are not required. There are no restrictions on the size, number, or species taken. Cleaning fish in the lake is prohibited; pack out your catch. To prevent the introduction of non-native organisms, *no organic bait of any kind may be used*. This includes fish eggs, PowerBait, and live or dead fish. Fishing is limited to artificial lures and flies only.

## Sky Gazing

With clean air, clear skies, and unobstructed views, Crater Lake is a great place to observe astronomical and meteorological events. Discovery Point and Cloudcap Overlook are favorite locations to watch the sunrise. For sunsets and moonrises, try Watchman Overlook or hike to the top of Watchman Peak.

## Swimming

Swimming is allowed in Crater Lake, but be warned—the water is cold! Most swimmers stay in the water for only a few seconds or minutes. Swimming is permitted only at Cleetwood Cove and at Wizard Island, which requires a boat tour to reach. The shoreline at both locations is narrow and rocky; there are no beaches.

## Wildlife Viewing

The park is home to many animals, but they can be difficult to spot. The most visible animals are deer and squirrels. Herds of elk are sometimes seen in the meadows along Rim Drive. Bobcats and mountain lions are present but rarely seen. Lucky observers might spot a fox, black bear, marmot, porcupine, grouse, or bald eagle. Dawn and dusk are the best times to look.

## Sky Calendar

Ask at a visitor center for additional sunrise and sunset times.

Date	Moonrise
June 25	8:36 p.m.
July 25	8:25 p.m.
Aug. 24	7:42 p.m.
Sept. 22	6:29 p.m.
Oct. 22	5:46 p.m.

### Sunrises & Sunsets

Date	Sunrise	Sunset
June 15	5:29 a.m.	8:49 p.m.
July 1	5:34 a.m.	8:51 p.m.
July 15	5:43 a.m.	8:45 p.m.
Aug. 1	6:00 a.m.	8:29 p.m.
Aug. 15	6:15 a.m.	8:11 p.m.
Sept. 1	6:33 a.m.	7:43 p.m.
Sept. 15	6:48 a.m.	7:18 p.m.
Oct. 1	7:06 a.m.	6:50 p.m.
Oct. 15	7:22 a.m.	6:26 p.m.

### Full Moons

## Boat Tours

Join a park ranger for a 2-hour cruise around Crater Lake. See the box below for departure times and ticket prices. Boat tours on Crater Lake are operated by Xanterra Parks & Resorts in partnership with the National Park Service.

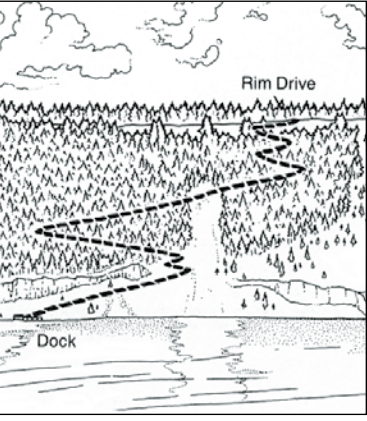
**Tickets**  
Half of the tickets for each tour are available for advance purchase. These tickets can be purchased by calling 1-888-774-2728 or by visiting [www.craterlakelodges.com](http://www.craterlakelodges.com).

The remaining tickets for each tour are available only on a first-come, first-served basis on the day of the tour. These tickets are sold only at the ticket booth at the top of the Cleetwood Cove Trail. The ticket booth opens at 8:30 a.m. daily. Tickets must be purchased at least 45 minutes prior to departure to allow time to walk down the 1.1-mile (1.7-km) trail to the lake. Be aware that boat tours may sell out very early in the day.





**Visiting Wizard Island**  
Up to 96 tickets each day are available for visitors wishing to disembark at Wizard Island to hike, fish, swim, and explore. Only 2 tours dock at Wizard Island: the 9:55 a.m. and 1:00 p.m. departures. The 5 standard tours do not stop. Most Wizard Island visitors will be dropped off for a 3-hour stay, before being picked up by a later boat to complete the tour around the lake. A limited number of tickets (8 per day) are available for visitors wishing to spend 6 hours on the island. See page 4 for information about the island's 2 hiking trails.

- What to Bring**
- Bring plenty of drinking water. Bottled water is available for purchase at both ends of the Cleetwood Cove Trail.
  - Bring a lunch or snack, especially if visiting Wizard Island. Light snacks are available for purchase at the top of the Cleetwood Cove Trail.
  - Sunscreen, sunglasses, and a hat are recommended for sun protection. The boats are not covered.
  - Weather on the lake can be windy and chilly. A warm, water-resistant jacket is advisable.
  - Wear sturdy footwear, especially if visiting Wizard Island.

**Hiking to Cleetwood Cove**  
The Cleetwood Cove Trail is the only legal access to the shore of Crater Lake. The trailhead is located on the lake's north side (see map on page 5). The hike is steep and strenuous: in 1.1 miles (1.7 km) the trail drops 700 feet (213 meters) in elevation. Walking back up is equivalent to climbing 65 flights of stairs! The trail is recommended only for those in good physical condition. It should not be attempted by anyone with heart, breathing, or walking problems. It is not accessible for people with mobility impairments. Hikers should wear sturdy shoes and carry water. Vault toilets are located at the top and bottom of the trail. Depending on snow conditions, the trail usually opens in late June and closes in late October.



The Cleetwood Cove Trail drops 700 feet (213 meters) to the lake shore. Sketch from Road Guide to Crater Lake.

Ranger-Led Activities	July 2–September 6	May 21–July 1 & September 7–October 17
<b>Crater Lake Talk</b> Learn about the origins of Crater Lake and discover its special qualities and features. Meet at the Sinnott Memorial Overlook. (20 minutes)	11:00 a.m. 1:00 p.m.	Check posted schedules
<b>Ranger's Choice Talk</b>  A different topic every time! Meet on the back porch of Crater Lake Lodge. For today's topics, check the sign on the Lodge back porch or ask at the Rim Visitor Center. (20 minutes)	2:00 p.m. 4:00 p.m.	Check posted schedules
<b>Junior Ranger Activities</b>  Kids participate in one or more activities to learn about Crater Lake and earn a Junior Ranger patch. Meet behind the Rim Visitor Center. Recommended for ages 6 to 12 but other ages are welcome. (20 minutes per activity)	Stop by any time between 1:30–4:30 p.m.	—
<b>Watchman Peak Sunset Hike</b> Ascend to a breathtaking viewpoint and watch the sun go down over the Cascade Mountain Range. Meet at the Watchman Overlook, a parking area with wooden fences 3.8 miles (6.1 km) northwest of Rim Village. Flashlights are not needed unless you plan to remain at the summit after sunset. See page 4 for trail details. (1.5 hours)	July 17-31 7:30 p.m. August 1-10 7:15 p.m. August 11-20 7:00 p.m. August 21-31 6:45 p.m. Sept. 1-6 6:30 p.m.	Hike offered from July 17-Sept. 12 Sept. 7-12 6:15 p.m.
<b>Evening Program</b>  Relax under the stars as you learn about the park. Check posted schedules for topics. Meet at the Mazama Campground Amphitheater, between loops D and E. (45 minutes)	July 2-31 9:00 p.m. August 1-20 8:30 p.m. August 21-31 8:00 p.m. Sept. 1-6 7:45 p.m.	Check posted schedules
<b>Rim Drive Trolley Tour</b>  Ride around the lake on a ranger-narrated tour of Rim Drive, with stops at 4 or more overlooks. See page 1 for more information. Tours depart from, and tickets are sold at, the Community House in the middle of Rim Village. Tickets may be purchased the day of the tour, or the day before, from 9:30 a.m. until the final departure of the day. Tours cover a variety of topics. (2 hours)	10:00 a.m. 11:00 a.m. 12:00 p.m. 1:00 p.m. 2:00 p.m. 3:00 p.m. An additional tour may be offered at 4:00 p.m.	Trolley tours will be offered daily through October 17 After September 6, check posted schedules for departure times
<b>Crater Lake Boat Tour</b> For a different perspective on Crater Lake, take a ranger-narrated boat tour. See the right-hand column of this page for detailed information. Note: Taking a boat tour requires hiking down—and back up—one of the steepest trails in the park. Tours cover a variety of topics. (2 hours)	Standard Tours: 10:00 a.m. 11:00 a.m. 12:00 p.m. 2:00 p.m. 3:00 p.m. Tour with Wizard Island Drop-Offs: 9:55 a.m. 1:00 p.m.	Boat tours will operate at full schedule from July 2-September 12 If weather and staffing permit, tours will be extended through September 19

Programs are free of charge except for trolley tours and boat tours. All programs are subject to cancellation due to inclement weather or other unforeseen circumstances.





# Let's Go Hiking!

Hi, I'm Ranger Karen. We have 90 miles (145 km) of hiking trails here at Crater Lake. Our most popular day hikes are listed on this page. To help you choose, I've rated them in terms of scenery, but keep in mind this is just one ranger's opinion! If you are visiting in June or early July, be aware that some trails might still be closed by snow. Please help us protect this special place by following a few important rules:

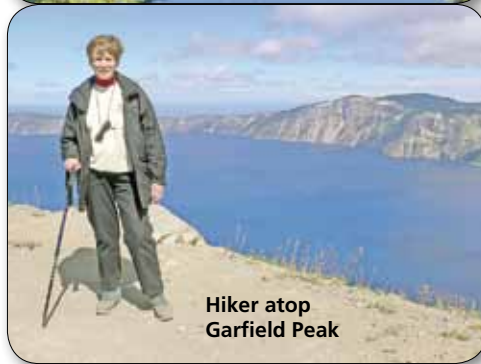
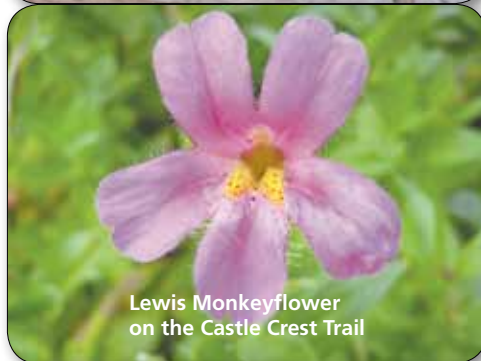
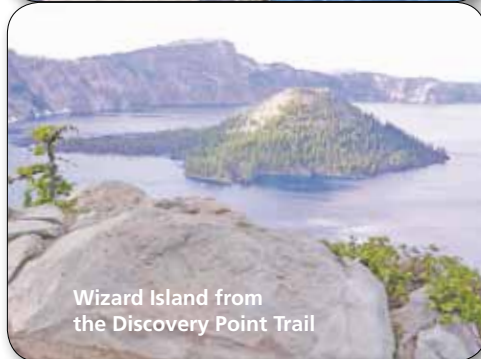
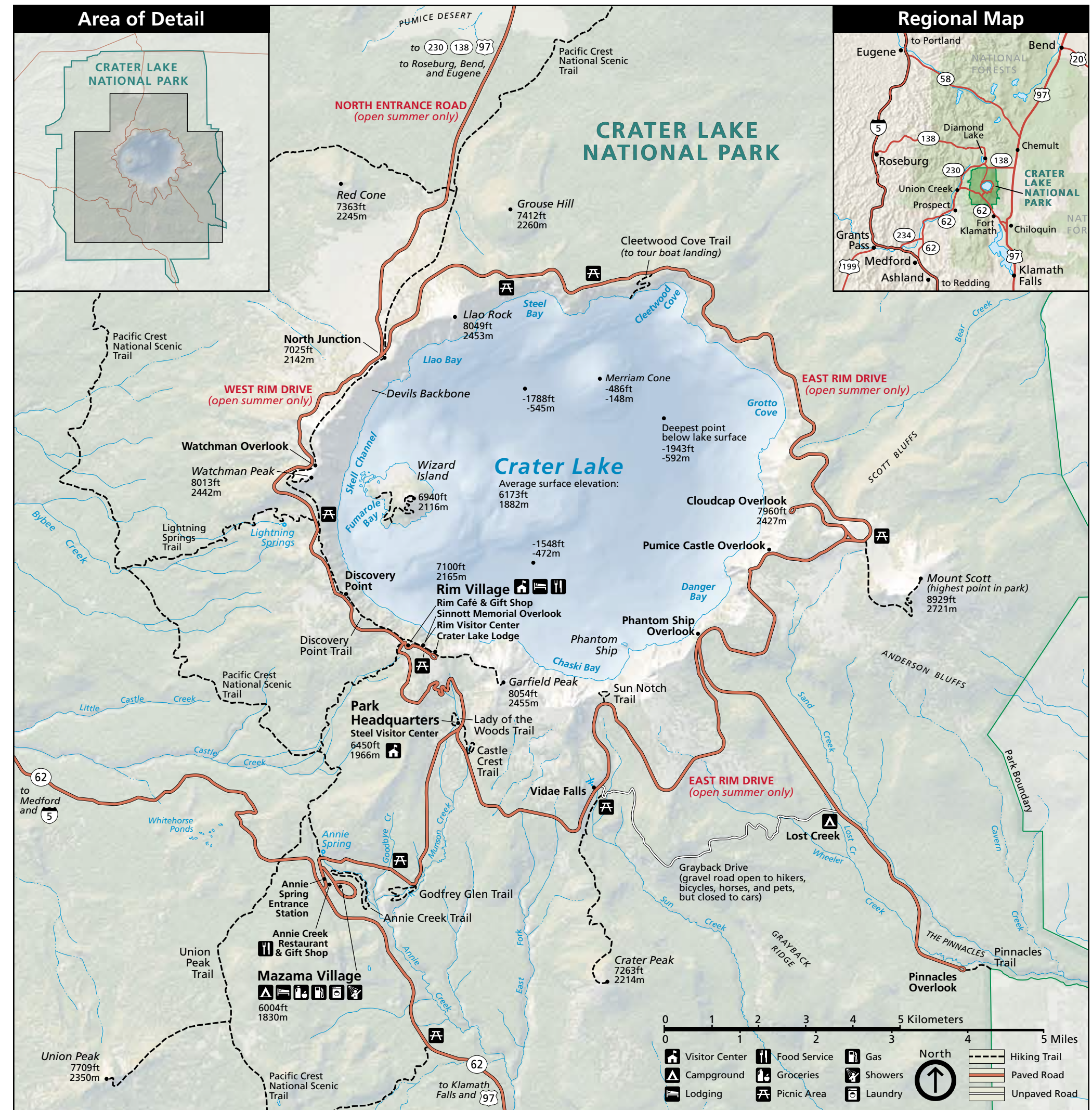
- ⚡ No hiking or climbing inside the caldera! The walls are dangerously steep and unstable. The one exception is the Cleetwood Cove Trail. It is the only legal access to the lake shore.
- ⚡ Overnight backpacking requires a permit. Free permits are available at either visitor center or at the ranger station at Park Headquarters. Some areas are not open to backcountry camping.
- ⚡ Leave all rocks, plants, animals, and artifacts undisturbed for the enjoyment of future hikers.
- ⚡ To protect vegetation and prevent erosion, please stay on the trails.
- ⚡ Pets are not allowed on park trails (see page 2).

Pinnacles Trail	Godfrey Glen	Trail	Castle Crest	Lady of the Woods
1 mile (1.6 km)	1 mile (1.6 km) loop trail	<b>Total Distance</b>	0.5 miles (0.8 km) loop trail	0.5 miles (0.8 km) loop trail
10 feet (3 meters)	50 feet (15 meters)	<b>Elevation Gain</b>	100 feet (30 meters)	120 feet (37 meters)
<b>30 minutes</b>	<b>30 minutes</b>	<b>Time</b>	<b>30 minutes</b>	<b>30 minutes</b>
<b>Volcanic Spires</b>	<b>Peaceful Forest</b>	<b>Highlight</b>	<b>Flowers, Meadow, Creek</b>	<b>Historic Architecture</b>
Easy walk along the rim of Pinnacle Valley. Great views of volcanic spires. Use caution near cliffs. Trail ends at park boundary. Accessible to wheelchairs with assistance. Open to bicycles.	Easy stroll through an old-growth forest, with some canyon views. Dirt path; accessible to wheelchairs with assistance. Self-guiding brochures are available at the trailhead.	<b>Description</b>	Loop trail through a beautiful meadow. Abundant wildflowers from mid-July to mid-August. The trail is rocky and slippery in places. Self-guiding brochures are available at the trailhead.	Loop trail around Park Headquarters. Self-guiding brochures, available at the trailhead, describe how early park architects integrated their designs with the natural landscape.
End of the Pinnacles Spur Road, 7 miles (11.3 km) southeast of the Phantom Ship Overlook.	2.4 miles (3.9 km) south of Park Headquarters.	<b>Trailhead Location</b>	East Rim Drive, 0.5 miles (0.8 km) east of Park Headquarters. Can also access from the Steel Visitor Center.	Behind the Steel Visitor Center, on the south side of the building.
The Pinnacles are chimneys formed when hot ash cooled after the big eruption.	Trail is named after William Godfrey, a ranger who died in a blizzard here in 1930.	<b>Nature Note</b>	The flowers here are nourished by springs emerging from the hillside.	The trail's name refers to a sculpture of a woman carved into a boulder along the trail.
★★★★	★★★	<b>Ranger Karen's Rating</b>	★★★★	★★★
Easy			Easy	

Sun Notch	Discovery Point	Trail	Annie Creek	Boundary Springs
0.5 miles (0.8 km)	2.2 miles (3.5 km)	<b>Total Distance</b>	1.7 miles (2.7 km) loop trail	5 miles (8.0 km)
115 feet (35 meters)	100 feet (30 meters)	<b>Elevation Gain</b>	200 feet (61 meters)	400 feet (122 meters)
<b>30 minutes</b>	<b>1 hour</b>	<b>Time</b>	<b>1½ hours</b>	<b>2½ hours</b>
<b>Views of Phantom Ship</b>	<b>Lake Views</b>	<b>Highlight</b>	<b>Creek, Canyon, Flowers</b>	<b>Springs, Stream, Flowers</b>
Short uphill walk through a meadow to the rim of Crater Lake. Walk along the rim path for great views of the Phantom Ship. Use caution near cliff edges.	Easy-to-moderate trail along the rim of Crater Lake, connecting Rim Village with Discovery Point. Fine views of the lake and Wizard Island. Use caution near cliff edges.	<b>Description</b>	Moderately strenuous trail through a deep, stream-cut canyon. Lots of water, wildflowers, and sometimes wildlife. Self-guiding brochures are available at the trailhead.	Moderate walk to the headwaters of the Rogue River. In northwest corner of the park, not shown on map to the right. May not be well-marked; see published guidebooks for trail details.
East Rim Drive, 4.4 miles (7.1 km) east of Park Headquarters.	West end of Rim Village, where the paved walk becomes a dirt path. Can also start from Discovery Point.	<b>Trailhead Location</b>	Mazama Campground, behind the amphitheater, located between loops D and E. Limited parking in E Loop.	Pullout on Highway 230 near milepost 19, 5 miles (8 km) west of the junction with Highway 138.
Sun Notch lies in an old glacial valley truncated by the collapse of Mt. Mazama.	Gold prospector John Wesley Hillman first spotted Crater Lake from this point in 1853.	<b>Nature Note</b>	The creek provides the park's drinking water, named the best tasting in Oregon in 2004.	Snowmelt, not Crater Lake, is the source of Boundary Springs' water.
★★★★★	★★★★★	<b>Ranger Karen's Rating</b>	★★★★★	★★★★★
Easy / Moderate			Moderate	

Watchman Peak	Crater Peak	Trail	Garfield Peak	Mount Scott
1.6 miles (2.6 km)	6.4 miles (10.3 km)	<b>Total Distance</b>	3.4 miles (5.5 km)	5 miles (8.1 km)
420 feet (128 meters)	765 feet (233 meters)	<b>Elevation Gain</b>	1,010 feet (308 meters)	1,250 feet (381 meters)
<b>1 hour</b>	<b>3½ hours</b>	<b>Time</b>	<b>2 to 3 hours</b>	<b>3 hours</b>
<b>Panoramic Views</b>	<b>Forest, Views, Solitude</b>	<b>Highlight</b>	<b>Panoramic Views</b>	<b>Panoramic Views</b>
Moderate ascent to a lookout above Wizard Island. Spectacular views in all directions. Great place to watch the sunset. Trail may be closed until late July due to snow.	Moderately strenuous walk to the summit of a small volcano. No lake views, but fine views of the Klamath Basin to the southeast. A peaceful walk through forests and meadows.	<b>Description</b>	Rocky climb to a high peak. Spectacular views along the way and at the top. Diverse plant life, many wildflowers. Top section may be closed until mid-July due to snow. Use caution near cliff edges.	Gradual ascent of the park's highest peak. Great views in all directions. Best in morning, when the light is ideal for lake viewing. May be closed until mid-July due to snow.
3.8 miles (6.1 km) northwest of Rim Village. Park at the viewpoint surrounded by wooden fences.	East Rim Drive, 3 miles (4.8 km) east of Park Headquarters at the Vidae Falls Picnic Area.	<b>Trailhead Location</b>	East end of Rim Village. Walk behind Crater Lake Lodge along the paved promenade.	East Rim Drive, 14 miles (22.5 km) east of Park Headquarters.
Built in 1932, the peak's historic fire lookout is still staffed by rangers today.	Upper Klamath Lake is the largest in Oregon, but its average depth is only 14 feet.	<b>Nature Note</b>	Rocky slopes along the trail are home to American pikas and yellow-bellied marmots.	Mt. Scott is the park's highest peak—8,929 feet (2,721 meters) in elevation.
★★★★★	★★★★	<b>Ranger Karen's Rating</b>	★★★★★	★★★★★
Moderate / Strenuous			Strenuous	

Union Peak	Cleetwood Cove	Trail	Wizard Summit	Fumarole Bay
11 miles (17.7 km)	2.2 miles (3.5 km)	<b>Total Distance</b>	2 miles (3.2 km)	1.8 miles (2.9 km)
1,600 feet (448 meters)	700 feet (213 meters)	<b>Elevation Gain</b>	760 feet (232 meters)	150 feet (46 meters)
<b>5 to 6 hours</b>	<b>1½ hours</b>	<b>Time</b>	<b>1½ hours</b>	<b>1 hour</b>
<b>Panoramic Views</b>	<b>Swim, Fish, Boat Tours</b>	<b>Highlight</b>	<b>Views, Summit Crater</b>	<b>Swimming, Fishing</b>
Long forest walk followed by a very steep climb. Spectacular views from the top and interesting geology, but no view of the lake. Top section may be impassable until mid-July due to snow.	The only legal access to the shore of Crater Lake. Strenuous trail with a steep grade. The trail descends to a rocky shoreline at Cleetwood Cove. See page 3 for detailed information.	<b>Description</b>	Rocky climb to the top of Wizard Island. Spectacular lake views, interesting geology. A path leads around the 90-foot-deep (27-meter) crater at the summit.	Rocky trail along the shore of Wizard Island. Becomes hard to follow after reaching Fumarole Bay. The shallow, clear water is good for fishing and swimming.
Highway 62 at the Pacific Crest Trailhead, 1 mile (1.6 km) west of the Crater Lake road junction.	North side of the lake, 11 miles (17.6 km) from Rim Village if traveling clockwise on Rim Drive.	<b>Trailhead Location</b>	Wizard Island dock, accessible only via a boat tour from Cleetwood Cove. See page 3 for information.	Wizard Island dock, accessible only via a boat tour from Cleetwood Cove. See page 3 for information.
Union Peak is the core of an old volcano eroded by glaciers during the last Ice Age.	Below 200 feet (61 meters), the water in Crater Lake stays 38°F (3°C) year-round.	<b>Nature Note</b>	The dead trees at the summit have been killed by dwarf mistletoe, a parasitic plant.	Abundant lichen on the tree trunks is an indication of excellent air quality.
★★★★	★★★★	<b>Ranger Karen's Rating</b>	★★★★★	★★★★
Strenuous			On Wizard Island	



## Highlights of the Rim Drive

Rim Drive is a 33-mile (53-km) road that encircles Crater Lake. Typically open in its entirety from early July to late October, it provides dramatic views of the lake's most interesting features as well as the jagged peaks, subalpine forests, and open meadows on the caldera's rim. It can be driven in about an hour, but at least 2 to 3 hours are necessary to enjoy the varied sights. There are more than 30 scenic pullouts along the route, many of which have roadside exhibits. Be sure not to miss these 6 "must-see" stops. For more information, pick up the excellent *Road Guide to Crater Lake National Park* (48 pages, \$5.95) at either visitor center.



**Watchman Overlook**  
This pullout offers an unmatched view of Wizard Island, a cinder-cone volcano named for its resemblance to a sorcerer's pointed hat. Wizard Island erupted out of the lake around 7,300 years ago and features a 90-foot-deep (27-meter) crater in its rocky summit. To find this unmarked pullout, drive 3.8 miles (6.1 km) west of Rim Village and look for a viewpoint lined with wooden fences.

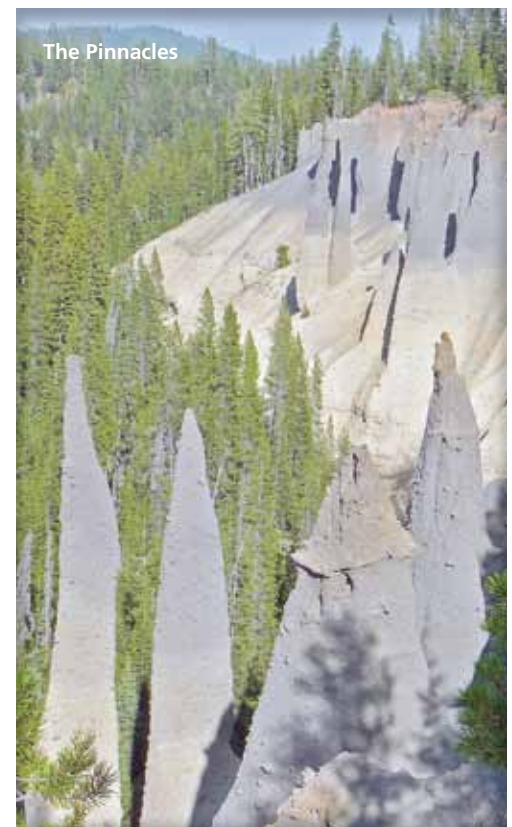
**Cloudcap Overlook**  
Reached by a 1-mile (1.6-km) spur road, Cloudcap Overlook is the highest point on Rim Drive, 1,790 feet (545 meters) above the water. Whitebark pines cling for survival here, dwarfed and contorted by the harsh winds.

**Pumice Castle Overlook**  
Stop here to see one of the park's most colorful and fanciful features: a layer of orange pumice rock that has been eroded into the shape of a medieval castle. Watch carefully for this unmarked viewpoint; it's easy to miss. The pullout is located 1.1 miles (1.8 km) west of the Cloudcap Overlook road junction and 2.4 miles (3.9 km) east of Phantom Ship Overlook.

**Phantom Ship Overlook**  
Nestled against the southeastern shore, Crater Lake's "other island" escapes detection by many park visitors. Though it resembles a small pirate ship, the island is as tall as a 16-story building. It's made of erosion-resistant rock, 400,000 years old—the oldest exposed rock within the caldera. This overlook offers a great view of the Phantom Ship framed through the trees.

**Pinnacles Overlook**  
Located at the end of a 7-mile (11-km) spur road, the Pinnacles are well worth the detour from Rim Drive. A colorful collection of 100-foot-tall (30-meter) spires are being eroded from the canyon wall. The spires are "fossil fumaroles," each marking a spot where volcanic gas rose up through hot ash deposits, cementing the ash into solid rock.

**Vidae Falls**  
Look for this cascading waterfall between Phantom Ship Overlook and Park Headquarters. A spring-fed creek tumbles over a glacier-carved cliff and drops 100 feet (30 meters) over a series of ledges. In summer, wildflowers flourish in the cascade's spray.





# Predicting the Next Eruption

## Scientists Install Sensors to Detect the Movement of Magma

In the summer of 2005, many visitors to the park arrived in a state of concern. The U.S. Geological Survey (USGS) had just named Crater Lake the 10th most dangerous volcano in America. For some visitors, concern turned to worry when they learned that neither a geologist nor a volcanologist is on the park's payroll. "Is it safe to spend the night at Crater Lake Lodge?" several asked.

While the park's volcanoes are currently quiet, it's true that USGS geologists predict renewed activity in the future. They estimate that there's roughly a 1 in 300 chance of an eruption happening in the park in any 30-year period. The odds may be slim, but it's sobering to realize that you are over 50 times more likely to witness a volcanic eruption during a 1-day visit to Crater Lake than to hit the jackpot with a \$1 ticket in the Powerball lottery.

The U.S. Geological Survey is tasked with warning the American public about volcanic hazards. In its 2005 report calling for the establishment of a "National Volcanic Early Warning System," it ranked the country's 169 potentially active volcanoes according to the threat they pose to life and property. Crater Lake came in 10th, not as a result of any current rumblings but because of the magnitude of its past eruptions and the park's relative proximity to population centers.

The same report identified a worrisome gap between the threat level at Crater Lake and the ability of scientists at the Cascades

Volcano Observatory (CVO)—the nearest USGS monitoring facility, located in Washington state—to detect signs of volcanic unrest here. Volcanoes typically give off signals that allow scientists to anticipate eruptions days to weeks in advance. As magma approaches the surface, it triggers swarms of small earthquakes, causes the ground to swell, and increases the emission of volcanic gases. Detecting these signals, however, requires that sensitive instruments be in place on the ground nearby.

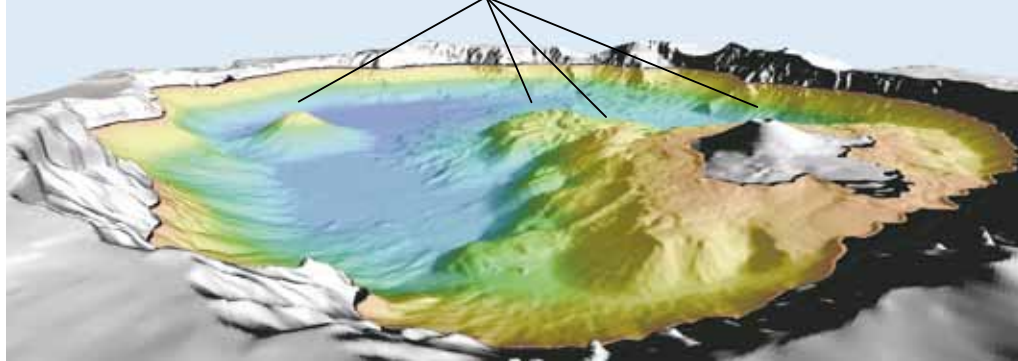
For that reason, a team of CVO geophysicists traveled to Crater Lake in the summer of 2009 and installed seismometers at 3 locations. With multiple seismometers, they'll be able to pinpoint the location of earthquakes through triangulation. The team also installed 4 GPS (global positioning system) units, which can measure ground deformation by using satellites to record each unit's horizontal and vertical position to within a few millimeters. With the help of on-site solar panels, data from these instruments will be transmitted to the CVO in real time, over the internet, allowing scientists to monitor Crater Lake from afar.

The eruption that formed the Crater Lake caldera 7,700 years ago was tremendously powerful and devastating. Not only did it cause the collapse of a 12,000-foot-tall (3,600-meter) peak, it annihilated all life forms within at least a 20-mile (32-kilometer) radius and suffocated much of the Pacific Northwest in a thick layer of ash. So, as a park visitor in 2010, should you be concerned for your safety?

Fortunately, another big eruption is unlikely to occur for many thousands of years. The magma reservoir beneath Crater Lake has not had sufficient time to recharge itself. Small eruptions, however, are possible, as evidenced by the lava dome that grew to within 95 feet (29 meters) of the lake's surface approximately 4,900 years ago, just east of Wizard Island.

Since that event, though, all indications are that the park's volcanoes have been in a deep, deep sleep. Hopefully, you'll be able to sleep deeply tonight at Crater Lake Lodge—or wherever you are staying—knowing that scientists now have instruments in place to give us early warning of the next eruptive episode.

The current tranquility of Crater Lake belies its violent past. A topographic map of the lake floor reveals 4 volcanoes, including Wizard Island, that have erupted since the collapse of Mount Mazama 7,700 years ago.



## Park Weather

Summers at Crater Lake are short, but generally warm and sunny. Even so, there are occasional days when the lake is completely shrouded by clouds and not visible from the rim. The weather is most variable in May, early June, late September, and October, when sunny periods alternate with days of rain and snow. July, August, and early September are your "best bets" for warm, dry weather. Winters at Crater Lake are long and snowy. Storms from the Pacific Ocean dump an average of 44 feet (13.3 meters) of snow at Park Headquarters. The park's tremendous snowfall is a result of its position at the crest of the Cascade Mountain Range.

FAHRENHEIT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily High (°F)	34	35	37	43	50	58	69	69	63	52	40	35
Average Daily Low (°F)	18	18	19	23	29	34	41	41	37	31	24	20
Extreme High (°F)	58	66	67	70	80	84	90	90	87	80	75	64
Extreme Low (°F)	-21	-18	-7	0	5	10	18	21	11	8	-7	-13
Avg. Snowfall (inches)	105	84	84	45	20	4	0.2	0.1	3	22	64	94
Avg. Snow Depth (inches)	80	104	117	112	77	24	1	0	0	2	17	49
Avg. Precipitation (inches)	10.5	8.1	7.8	4.9	3.3	2.2	0.8	1.0	2.0	5.0	9.4	11.4
Avg. Lake Surface Temp. (°F)	38	37	37	38	40	45	55	59	57	51	44	40

CELSIUS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily High (°C)	1	2	3	6	10	14	21	21	17	11	4	2
Average Daily Low (°C)	-8	-8	-7	-5	-2	1	5	5	3	-1	-4	-7
Extreme High (°C)	14	19	19	21	27	29	32	32	31	27	24	18
Extreme Low (°C)	-29	-28	-22	-18	-15	-12	-8	-6	-12	-13	-22	-25
Avg. Snowfall (cm)	267	213	213	114	51	10	0.5	0.3	8	56	163	239
Avg. Snow Depth (cm)	203	264	297	284	196	61	3	0	0	5	43	124
Avg. Precipitation (cm)	27	21	20	12	8	6	2	3	5	13	24	29
Avg. Lake Surface Temp. (°C)	4	3	3	3	4	7	13	15	14	10	7	4



Susie Roe-Andersen taking measurements at one of her research plots. Temporary flags mark the location of individual moonworts. Of the park's 9 populations, the smallest has only 2 individuals while the largest is home to 1,300.

Close-up of a 3-inch-tall (8 cm) pumice moonwort. The fern's frond is divided into two blades—a short one that makes food through photosynthesis, and a taller one that produces wind-borne spores for reproduction. The spores are held in spherical capsules that look like grapes, which explains the plant's other common name: pumice grapefern.

## In Search of a Rare Fern

### Researcher Seeks to Explain the Scarcity of the Pumice Moonwort

Over 100 years ago, a new species of fern was discovered on the rim of Crater Lake. Yet, while it lives near popular viewpoints in the middle of a national park, few people have ever seen it or heard of it. It stands only a few inches tall, blends in with the pebbly pumice rock on which it grows, and is overshadowed by the grandeur of its surroundings. Today, one researcher is trying to bring attention to this rare plant—commonly known as the pumice moonwort—and learn why its range is limited to only a few locations in the park and surrounding national forests.

"They're almost invisible," says Susie Roe-Andersen, a biological technician with the park. "But when you finally see one, it's a thrill, and you want to look for more! I call this condition 'Moonwort Madness,' and I've been afflicted!" Roe-Andersen recently wrote her thesis on the pumice moonwort (*Botrychium pumicola*) while earning an M.S. in Biology at Southern Oregon University. "The mystery surrounding this little fern intrigued me. Land managers are trying to understand why it's restricted to isolated volcanic habitats. I focused my research on the factors affecting its distribution. I wanted to increase our understanding of its habitat requirements to help in the conservation of this rare species."

Her research was funded, in part, through purchases made by the public in the park's visitor centers. The non-profit Crater Lake Natural History Association runs the visitor center bookstores and donates money every year to scientific investigation.

Roe-Andersen's first task was to locate the tiny ferns. They typically live on pumice-covered slopes, emerging in July after the snow melts. Some years, they undergo a subterranean phase and don't emerge from the ground at all. When they do emerge, they grow to heights of only 1 to 3 inches (2 to 8 cm). So far, 9 separate populations have been found in the park, all on the rim of Crater Lake. Other, scattered populations exist in southern and central Oregon, and one has been found on the slopes of Mount Shasta in California.

To understand why the moonworts grow only in certain locations, Roe-Andersen compared the site characteristics of places with the ferns to places, just a few feet away, without the ferns. She discovered that pumice moonworts seem to prefer spots with lower soil temperatures, higher soil densities, and higher concentrations of potassium in the soil. A possible reason for this preference is that moonworts obtain water and nutrients from special types of underground fungi, and these characteristics might be beneficial to their fungal partners. If the fungi can't survive in a particular spot, the moonworts can't either.

Currently, one of the park's moonwort populations seems to be on the decline. Could this be a result of climate change? In the future, higher temperatures and lower soil moisture levels might push the species northward in latitude and up in elevation. But will the fern find suitable habitat there? On the rim of Crater Lake there's nowhere higher to go. In the meantime, the state of Oregon has listed the fern as a threatened species. It doesn't seem to be expanding its range, so protecting known populations is critical.

"The pumice habitat is very fragile and the living conditions are extremely harsh," says Susie Roe-Andersen. "The plants are dealing with intense solar radiation, desiccating winds, hot and cold temperatures, and a short growing season. It's important that we stay on established paths and overlooks along the Rim Drive and not wander into the pumice fields. The view of the lake is so overwhelming that sometimes we don't notice what is right under our feet—it could be a moonwort! Life is hard enough for these ferns without having to cope with trampling."

This summer Roe-Andersen will be continuing her research, treading carefully to look for undiscovered populations of pumice moonwort in the park. "Now that I've caught Moonwort Madness, I can't stop searching for these amazing ferns! They hold many secrets to surviving in this harsh, windswept landscape."

## Black Bear Census a Success

The results are in! Last summer's edition of this publication described efforts by park biologists to count the number of black bears inhabiting Crater Lake National Park. From July through September, biologists deployed "bear hair snare" devices in trees throughout the park and collected a total of 46 hair samples from bears who ascended the trunks in pursuit of a scented bait.

DNA analysis now reveals that 27 individual bears "donated" hair to the survey, giving us the minimum number of bears that utilized the park during the summer of 2009. Somewhat surprisingly, 70% of the individuals were female. This might relate to the fact that females typically have a smaller home range than males, allowing more of them to occupy the park without directly competing with each other. It might also indicate that the park is home to a fairly healthy and stable population. In the future, biologists hope to track bear movements using GPS technology to understand precisely how black bears utilize Crater Lake National Park.

# Park Launches Artist-in-Residence Program

## Art Show Scheduled for July 10 & 11

Does Crater Lake's beauty speak for itself? Perhaps, but if artists in the 19th century had not gone out of their way to translate the beauty into photographs, paintings, and poems, the lake might never have been protected as the centerpiece of a national park.

In August 1874, before Crater Lake had yet appeared on any map, photographer Peter Britt spent five days traveling to the rim by wagon and on foot, with 200 pounds of primitive photographic equipment in tow, to capture a series of black-and-white glass-plate negatives. The resulting photographs, according to historian Rick Harmon, "became the strongest single influence in transforming Crater Lake from a regional curiosity to a statewide attraction, and then, in time, to an acknowledged national landmark." Britt's photos, along with the works of painters and poets across the West, opened the eyes of the public to America's scenic wonders and stimulated interest in the protection of natural areas.

Today, 136 years later, the arts still play a vital role in how we understand and enjoy Crater Lake. In the past year, four artists have participated in the park's new artist-in-residence program. Drawing inspiration from their surroundings, they have created works of art that are helping us to experience the park in new ways and see it from different perspectives. Many of these works will be on display this summer at an art show to be held July 10 and 11 at the Community House in Rim Village.

"We're trying to celebrate all the arts," says Linda Hillgoss, education coordinator for the park's Science and Learning Center, which operates the program. "Writers, sculptors,

photographers, painters, dancers, musicians, cinematographers, composers, and other visual and performing artists are invited to apply." Selected artists are provided free housing for two weeks in order to pursue their particular art form in the midst of the park's awe-inspiring landscape. In return, they agree to present an educational program to the public during their residency.

Erik DeLuca was one of two resident artists last winter. A composer and PhD student at the University of Virginia, DeLuca spent two weeks recording natural sounds—from howling winds to chattering birds to melting snow—which he will incorporate into a musical piece that evokes and interprets the winter experience at Crater Lake. The park's other winter 2010 artist, Felicia McFall from Santa Rosa, California, is illustrating a pop-up book that depicts the origins of Crater Lake from the perspective of local American Indian tribes whose ancestors witnessed the lake's formation. In the summer of 2009, the park hosted two watercolor painters—Susan Semenick from Indiana and Paula Fong from nearby Talent, Oregon.

"Artist-in-residency programs give artists the luxury of time and the access to inspiration," notes Fong. "I sat still long enough to appreciate the details of this dynamic environment, which is so much more than 'just a big blue lake.' I was able to translate what I experienced into paintings to share my experience with others. It's a win-win formula where everyone benefits."

To learn more about the artist-in-residence program, ask for an application at either park



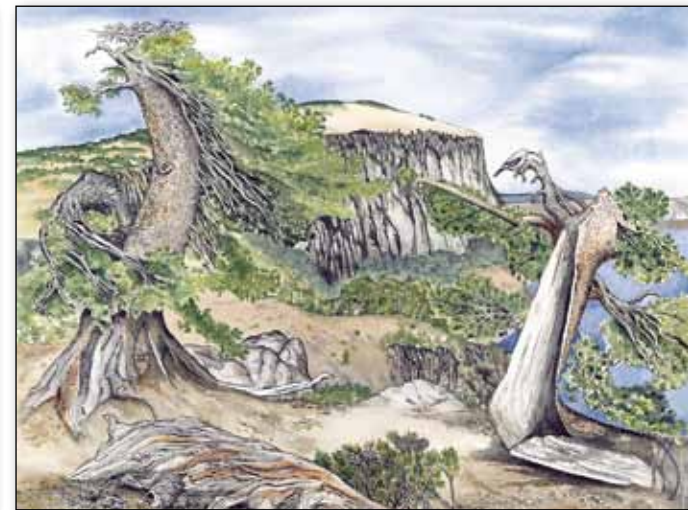
A Swiss immigrant, Peter Britt moved to Oregon in search of gold but found his calling as a painter and photographer.



Earliest photograph of Crater Lake, taken by Peter Britt on August 13, 1874. Many Oregonians gained their first knowledge of the lake through this image.



Paula Fong, summer 2009 artist-in-residence.



Whitebark Pine and Lao Rock, watercolor with pen and ink, by Paula Fong. A former soil scientist, Fong specializes in illustrating plants in their natural habitat. To see more of her art, visit www.prfong.com.

visitor center or surf to [www.nps.gov/crla/slc.htm](http://www.nps.gov/crla/slc.htm). Applications for the fall 2010 residency are being accepted through July 15. Both established and emerging artists (including students) are encouraged to apply. One from each category will be selected for the fall of 2010 as well as the winter of 2011.

By revealing and illuminating different aspects of the park's beauty, character, and significance, Crater Lake's resident artists are following in the footsteps of Peter Britt and leading us toward a deeper appreciation of our collective natural heritage.

# Crayfish: A Threat to Crater Lake?

Hikers who soak their feet at the bottom of the Cleetwood Cove Trail are often surprised by what they see in the water when they dangle their toes. A population of crayfish (*Pacifastacus lenisculus*) is thriving along the rocky shoreline, causing scientists to wonder about its origin and its potential impact on the lake's ecology. Are crayfish peaceful native residents of Crater Lake or harmful invaders?

Little was known about the lake's crayfish until 2008, when John Umek, a student at the University of Nevada, Reno, arrived in the park to conduct research for his Ph.D. To understand the species' distribution and abundance, he set hundreds of traps and searched for crayfish while snorkeling at 39 locations along the shore. Umek identified two distinct populations: one centered in Cleetwood Cove and one around Wizard Island. He also found a few individuals below Crater Lake Lodge.



Umek's 2008 survey also revealed something interesting about the vertical distribution of crayfish in Crater Lake. Although traps that were placed 3 to 10 meters (10 to 33 feet) deep yielded the largest catch, several crayfish found their way into traps resting 250 meters (820 feet) down on the floor of Cleetwood Cove. Nowhere else in the world have crayfish been reported living at such great depths.

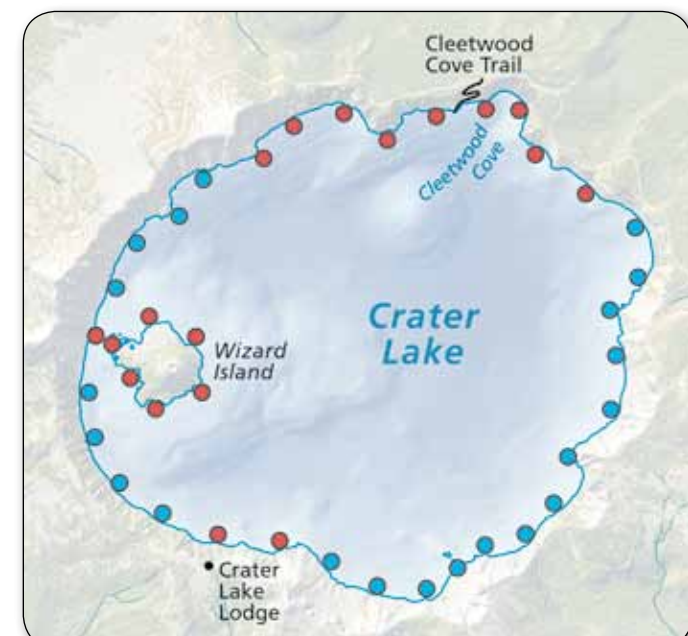
In 2009, John Umek returned to the park to investigate a more critical question: are crayfish having an effect on Crater Lake's ecology? To find out, he used an underwater vacuum to scoop up sediments from the lake floor, both in locations where crayfish were absent as well as abundant. He then painstakingly sorted through the sediments in search of insects, worms, snails, and other bottom-dwelling creatures.

The difference was remarkable. Whereas Umek found up to 600 "benthic invertebrates" living in one square meter's worth of material taken from crayfish-free areas, he counted no more than 100 organisms per square meter in crayfish-inhabited areas. Some species, including snails, were missing entirely from crayfish terrain. All told, Umek found a richer biodiversity—and 8 times as many individual organisms—in places without a crayfish presence.

Park scientists are concerned, too, that crayfish appear to be having a negative impact on larger residents of the shoreline community, including newts, salamanders, and frogs. It's not yet clear whether crayfish are preying on these organisms or simply out-competing them for resources. Like humans, crayfish are omnivores. They will eat almost anything, from algae to small fish.

Umek, who is also studying crayfish in Lake Tahoe, plans to return to Crater Lake this summer for additional research. Snorkel surveys in 2009 indicated that crayfish might be expanding their range eastward along the north shore. Will the lake's entire circumference someday be populated by crayfish, as at Lake Tahoe? Is the threat significant enough to warrant attempts to control the crayfish population?

Right now, there are more questions than answers, but one thing's for sure: beneath the placid surface of Crater Lake a myriad of organisms, including crayfish, are engaged in a life-and-death struggle for food, territory, and survival.



Crayfish distribution map. Each dot represents an attempt to look for crayfish in 1 meter (3 feet) of water along the shore of Crater Lake. Red dots indicate where crayfish were found; blue dots indicate crayfish-free waters.



To determine where crayfish are present in Crater Lake, researcher John Umek (right) captured them in traps and performed visual surveys while snorkeling along the shore.



# Support Your Park—

## Buy Crater Lake License Plates

If you live in Oregon, consider choosing Crater Lake license plates for your vehicle. For a one-time charge of \$20, you can outfit your car with these beautiful plates while supporting park projects. You can purchase Crater Lake plates at any time, not just when buying a new vehicle or renewing your registration. Visit [www.craterlakeplates.com](http://www.craterlakeplates.com) or any Oregon DMV office for details.

Money from plate sales goes into an endowment that funds the operation of the park's Science and Learning Center. The center opened in 2006 and consists of two renovated historic structures near Park Headquarters: the original Superintendent's Residence and Chief Naturalist's Residence. These buildings now provide living and working space for visiting scientists, teachers, and artists.

The Science and Learning Center draws researchers and educators to Crater Lake from around the world, encouraging them to use the park as an outdoor laboratory and classroom. For more information about the Science and Learning center and its programs, visit [www.nps.gov/crla/slc.htm](http://www.nps.gov/crla/slc.htm).



Science and Learning Center



## Volunteer Your Time

Looking for a hands-on way to help the park? Consider sharing your time and talents as a Crater Lake VIP (Volunteer-In-Parks). Full-time volunteers are needed throughout the year to help staff visitor centers, present interpretive programs, and assist with research and monitoring projects. Opportunities are advertised at [www.volunteer.gov/gov](http://www.volunteer.gov/gov). Volunteers are provided free housing and a small stipend in exchange for 3 months or more of service.

To assist with special projects or volunteer periodically, join The Friends of Crater Lake, a non-profit organization founded in 1993. Members remove non-native plants, build and maintain trails, contact visitors, and much more. For more information, visit [www.friendsofcraterlake.org](http://www.friendsofcraterlake.org).

The Crater Lake Ski Patrol has been assisting winter visitors and maintaining the park's cross-country ski trails since 1983. Members, identifiable by their bright red parkas, receive training in wilderness first aid, survival skills, search and rescue, map and compass use, and avalanche forecasting in exchange for at least 6 days of service each winter. For more information, visit [www.craterlakeskipatrol.org](http://www.craterlakeskipatrol.org).



Volunteer Ski Patrollers

## Shop in the Visitor Center Bookstores

When you shop in the Steel Visitor Center or Rim Visitor Center, all proceeds from your purchase are invested back into the park. The visitor center bookstores are operated by the Crater Lake Natural History Association, a non-profit organization established in 1942 to support the park's educational and scientific programs. Money generated from bookstore sales goes to fund a variety of important projects, including the printing of this newspaper!

Some of the bookstores' offerings are described to the right. For a complete list of merchandise and to buy items online, visit [www.craterlakeoregon.org](http://www.craterlakeoregon.org). Items can also be purchased by phone by calling 541-594-3111.



## Get Involved with the Crater Lake Trust

The Crater Lake National Park Trust is a non-profit organization that raises private funds to support park projects and connect the park with surrounding communities.

The Trust has provided transportation funding, for example, that has enabled thousands of grade-school students to visit the park. In a program called "Classroom at Crater Lake," kids engage in hands-on science and learn about wildlife, old-growth forests, and winter ecology. Over half of these kids have never been to the park before.

The Trust also organizes events for the general public at Crater Lake, including fishing trips, stargazing sessions, yoga workshops, and free "Family Days." And its new lecture series brings "the park to the people" with free public talks in Portland, Eugene, Bend, Ashland, and other local communities.

The Trust produces a free, monthly, e-mail newsletter that can help you keep in touch with the park and learn about upcoming events and volunteer opportunities. To sign up, visit [www.craterlaketrust.org](http://www.craterlaketrust.org) or send an e-mail to [info@craterlaketrust.org](mailto:info@craterlaketrust.org). You can also find the Trust on Facebook and Twitter, or write to P.O. Box 62, Crater Lake, OR 97604. Share your love of the park by making a tax-deductible gift.



"Classroom at Crater Lake"

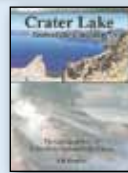
## Share Your Comments

Whether you have a compliment, complaint, or suggestion, we'd like to hear from you! This is your national park, and we value your input on how best to manage it. You can provide feedback in several ways. Ask for a comment form at a visitor center, send an e-mail to [crla\\_information\\_requests@nps.gov](mailto:crla_information_requests@nps.gov), or write to: Superintendent, Crater Lake National Park, P.O. Box 7, Crater Lake, OR 97604.

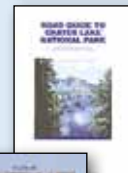
## Recommended Reading



**A Guide to Crater Lake: The Mountain That Used To Be**  
A great introduction to the park. Inexpensive yet informative, with beautiful photos. 48 pages, \$5.95.



**Crater Lake: Gem of the Cascades**  
A comprehensive guide to the park's geologic story. 168 pages, \$15.95.



**Road Guide to Crater Lake National Park**  
Consult this handy guide as you drive the park's roads for a deeper understanding of the sights along the way. 48 pages, \$5.95.



**Trails of Crater Lake National Park & Oregon Caves National Monument**  
New for 2010! A detailed guide to 24 hiking trails. 112 pages, \$14.95.



**Exploring Crater Lake National Park: A Family Activity Book**  
Fun, educational puzzles and activities for kids. 103 pages, \$12.95.



**Trees To Know in Oregon**  
Tree identification is easy and enjoyable with this photo-packed, fact-filled guide. 151 pages, \$12.00.



**Wildflowers of Southern Oregon**  
Detailed descriptions and vivid photos of more than 400 flower species, organized by color and family. 182 pages, \$18.95.



**Crater Lake National Park: A History**  
A thoughtful and thorough account of the park's rich human history. 280 pages, \$19.95.

## Other Useful Items



**The Mountain That Became a Lake CD**  
Listen to this CD as you drive the park's roads. Park rangers and American Indians share facts, stories, and insight about Crater Lake. 60 minutes, \$16.95.



**Crater Lake Topographic Map**  
1:55,000 scale. Waterproof and tearproof. \$11.95.



**Plants & Animals of Crater Lake Nat'l Park**  
This folding, waterproof pocket guide will help you identify the park's most visible species. 11 pages, \$6.95.



**Star and Planet Guide**  
Rotating "planisphere" for locating stars, planets, and constellations in the night sky. \$11.95.



**Crater Lake: Mirror of Heaven DVD**  
Expanded version of the film shown at the Steel Visitor Center. Traces the lake's human history from American Indian narratives to the protection of the lake as a national park. 27 minutes, \$19.95.



**Crater Lake Water Bottle**  
Stainless steel water bottle with Crater Lake logo. 25 ounces (.75 liters), \$17.95.



**Crater Lake Cinch Sack**  
Carry your water, snacks, and sunscreen. Available in blue, green, or red. \$16.95.



**Crater Lake Hiker Hat**  
Protect your head from the sun's rays. Available in blue, green, or khaki. 100% cotton, \$24.95.

EXPERIENCE YOUR AMERICA™



National Park Service  
U.S. Department of the Interior  
Crater Lake National Park  
P.O. Box 7  
Crater Lake, OR 97604

—Thank You!