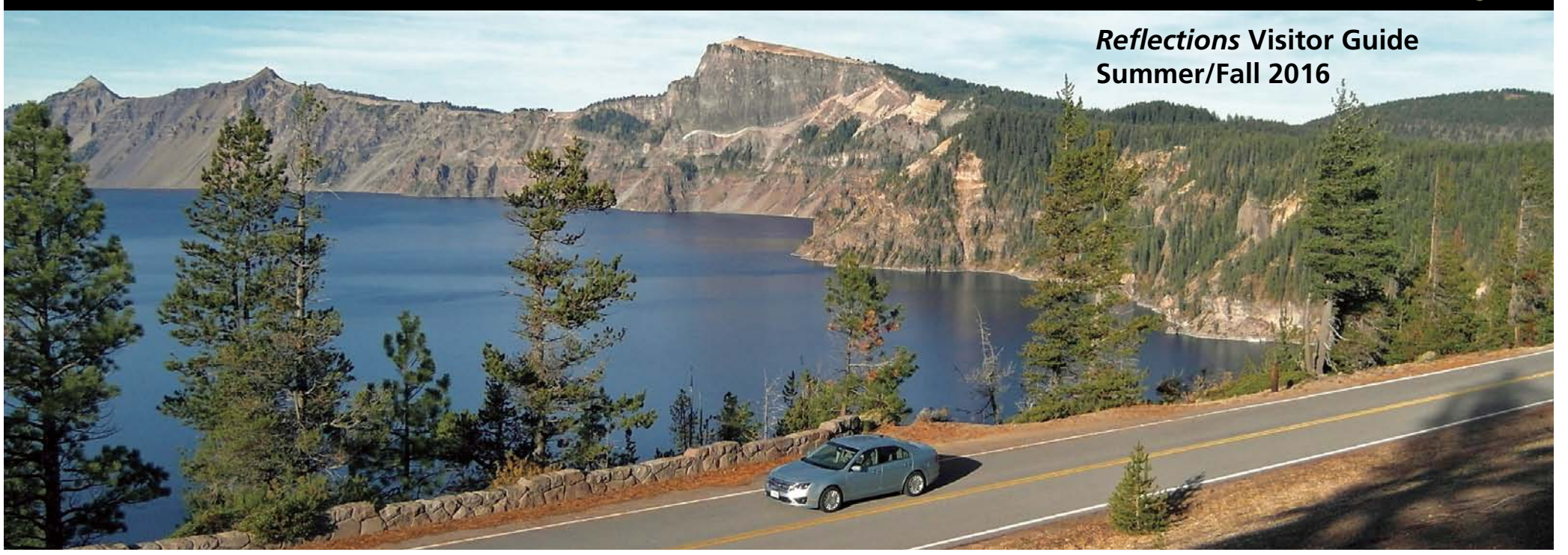
Crater Lake

National Park Service
U.S. Department of the Interior



***Reflections* Visitor Guide**
Summer/Fall 2016

Park News

- **Cleetwood Trail to Close for the Season August 15**
  The Cleetwood Cove Trail will be closing early this year for emergency repairs and to upgrade the trailhead parking lot (which will include the addition of 58 parking spaces). Starting August 15, there will be no access to the shore of Crater Lake until the summer of 2017. We apologize for this inconvenience and thank you for your understanding as we undertake these important improvements to the park's infrastructure.

- **West Rim Drive: 30-Minute Delays are Possible**
  Road construction might delay your trip through the park this summer. The Federal Highway Administration is undertaking a 3-year, $18 million rehabilitation of 10.7 miles (17.2 km) of the park's historic Rim Drive. Built in the 1930s, the road is badly in need of repair. Decades of harsh weather and the erosion of underlying soils have destabilized the road's shoulders and retaining walls. Be prepared for delays of up to 30 minutes on the West Rim Drive and at Rim Village. Thank you for your patience!

- **East Rim Drive will be Vehicle-Free on Sept. 17 & 24**
  On two Saturdays this September, motor vehicles will not be allowed on the park's East Rim Drive. Bicyclists and pedestrians will have an opportunity to enjoy 24 miles (39 km) of scenic roadway without vehicle noise and traffic. Check the park's website (www.nps.gov/crla) for more information about this event.

Welcome!

Welcome to Crater Lake! While this magnificent place has been a national park for over 114 years, in 2016 we join 410 other sites across the nation in celebrating the 100th birthday of the organization that was created to oversee it and ensure that it is protected and available for you and your descendants to enjoy for the next hundred years and beyond. Happy Birthday National Park Service! We are proud to be part of the world's premier organization whose purpose is to protect, preserve, and make available for public enjoyment the incredible, awe-inspiring places that are part of our natural and cultural heritage. Nature and parks are an integral part of all of our lives. They deserve a special place in our hearts—worthy of preservation so that we

(continued on back page)

Explore the East Rim

Plus 10 Other Ways to Enjoy Your Park

The Phantom Ship

"Is it worth driving all the way around Crater Lake?" In the summer, this is one of the most frequently asked questions at the park's two visitor centers. The answer is easy: a resounding YES! While the West Rim Drive boasts outstanding views and a quicker route through the park, the 24-mile (39-km) East Rim Drive is just as spectacular, and much more varied.

At Cloudcap Overlook, you can visit the highest point in Oregon reachable by paved road. At Phantom Ship and Pumice Castle Overlooks, you can study fascinating geological features. At Vidae Falls, you can enjoy the park's only drive-by waterfall. And if you take a detour down the Pinnacles Road, you'll see towering volcanic spires.

Not only does the East Rim Drive feature a wide variety of viewpoints, it provides access to some of the park's best hiking trails, including Plaikni Falls, Mount Scott, and Sun Notch. It also offers relative peace and quiet, since less than half of the cars that enter the park go there. And this summer, with road-construction delays possible on the West Rim Drive, there is no better time than the present to take the "long way" around the lake. See page 5 for a map and more details, and see below for 10 other suggestions to make your visit to Crater Lake National Park more memorable, meaningful, and fun.

Watch the Park Film
Explore the park's violent past and its present tranquility in this 22-minute film, shown on the hour and half-hour at the Steel Visitor Center at Park Headquarters.

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, walks, kids programs, boat tours, and trolley tours are offered daily *(see page 3)*.

Find the Phantom Ship
Anchored near the lake's south shore is an island that seems to be sailing away. To see it, hike to Sun Notch or drive to the viewpoint named in its honor *(see page 5)*.

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)*.

Have a Picnic
The viewpoints and picnic areas along the Rim Drive are perfect for outdoor eating *(see page 5)*. Stop by the Rim Village Café for grab-and-go sandwiches, salads, and snacks.

Savor the Sunset
Sunsets in the park can be spectacular. Join a ranger for a hike up Watchman Peak *(see page 3)* or pick a private viewpoint on the East Rim Drive.

View the Milky Way
On moonless nights, the park offers some of the darkest night skies in America. Look up to see meteors, satellites, planets, and the starry arms of our galaxy.

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 for the season on November 1 (or earlier if there is significant snowfall).

Crews begin plowing these roads in April, but opening dates vary. The North Entrance Road and West Rim Drive tend to open by 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 major snowstorms.

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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 last year: 615,000

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

- Annual snowfall: 43 feet (13 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.

Bicyclist on East Rim Drive

Rim Visitor Center

Wizard Island

Exhibits at the Sinnott Memorial Overlook

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

Crater Lake Visitor Guide
Summer/Fall 2016

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.

Park Phone: 541-594-3000
Website: www.nps.gov/crla
Mail: PO Box 7, Crater Lake, OR 97604
Email: craterlake@nps.gov

Accessibility
Except for the Sinnott Memorial Overlook, developed areas in the park are generally accessible to individuals with mobility impairments. Wheelchair-accessible paths include the Rim Village promenade and the Pinnacles Trail. The Godfrey Glen, Sun Notch, and Plaikni Falls trails are accessible to wheelchair users with assistance *(see page 4)*. Multiple pull-outs on Rim Drive have wheelchair-accessible wayside exhibits. Some ranger programs are accessible to people with limited mobility and other impairments *(see page 3)*. We are working hard to improve our level of accessibility for all park visitors. We welcome your comments.

ATMs
The Mazama Village Store and Rim Village Gift Shop have ATMs.

Drinking Water
Water faucets can be found at Rim Village, Mazama Village, and inside the Steel Visitor Center. Bottled water can be purchased at the top and bottom of the Cleetwood Cove Trail (when boat tours are operating).

Electric Vehicle Charging Station
A 24-hour charging station is located by the Annie Creek Gift Shop. It has one standard (J1772) connector and one Tesla connector.

Emergencies
Dial 911 to report any emergency, 24 hours a day. First aid is available at visitor centers and the ranger station at Park Headquarters.

Entrance Fee
The entrance fee for Crater Lake National Park is $15 per family car, good for 7 days. The rate is higher for commercial vehicles. Your fees are put to work improving visitor services and facilities. Thank you for supporting your national parks!

Gasoline
Self-serve, unleaded gas is available at the Mazama Village Store during business hours.

Internet
Wireless internet is free for guests of Crater Lake Lodge and The Cabins at Mazama Village. Public Wi-Fi is available at Crater Lake Lodge and the Annie Creek Restaurant for $4 per hour or $10 for 24 hours.

Lost & Found
Contact a ranger at either visitor center or call 541-594-3060.

Phones
Cell-phone reception in the park is unreliable. It depends on your location and provider. Pay phones are located outside the Mazama Village Store and inside Crater Lake Lodge.

Picnic Areas
Picnic areas are found throughout the park *(see page 5)*. The Rim Village picnic area has fire grates. Most picnic areas have vault toilets but no running water.

Post Office
A US Post Office is open Monday through Saturday in the Steel Visitor Center. Summer hours are 9:00 am–noon and 1:00–3:00 pm.

Recycling
Combination trash/recycling bins can be found around the park at more than 20 locations. Recycling is currently limited to aluminum cans and plastic bottles. All bins can accept both.

Restrooms
Restrooms with flush toilets and running water are located at Rim Village, Mazama Village, Lost Creek Campground, and in the Steel Visitor Center (9:00 am–5:00 pm). Vault toilets are located at most picnic areas, Watchman Overlook, and both ends of the Cleetwood Cove Trail *(see map on page 5)*.

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

Services & Facilities

Camping

The park has two campgrounds. Senior Pass and Access Pass holders are entitled to a 50% discount. Overnight parking elsewhere is not allowed, except by backcountry permit *(see page 3)*. For a list of campgrounds outside the park, ask at a visitor center.

Mazama Campground (214 sites) is located 7 miles south of Rim Village near Highway 62. In 2016, it will be open June 3–October 9. All sites in June are first-come, first-served. After June, 75% of campsites are reservable in advance by calling 888-774-2728 or online at www.craterlakelodges.com. The remaining 25% are first-come, first-served. In July and August, the campground usually fills up, typically by late afternoon. The campground offers tent sites ($22 per night) and RV sites ($31). A few of the RV sites have electric hookups ($35). A water hookup is available at the dump station. 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 seen, but campers are advised to store all food in their locker or vehicle. The campground has drinking water, flush toilets, showers, and laundry facilities. A general store sells groceries, firewood, and gasoline. You can call Mazama Campground directly during the summer at 541-594-2255 ext. 3610. It is operated by the park's concessioner, Xanterra Parks & Resorts.

Lost Creek Campground (16 sites) is a small, tents-only campground on the road to Pinnacles Overlook ($10 per night). It usually opens in early July and closes in mid-October. Registration is self-service, and reservations are not taken. In July and August, it typically fills by mid-afternoon. It has drinking water, sinks, and flush toilets. Each site has a picnic table, fire ring, and food locker. Payment can be made by check or exact cash. Lost Creek Campground is operated by the National Park Service.

Food & Dining

The **Annie Creek Restaurant** in Mazama Village features hearty breakfasts, a variety of entrees, burgers, pizza, and a soup & salad bar.
- May 27–June 16 8:00 am–8:00 pm
- June 17–Sept. 5 7:00 am–9:00 pm
- Sept. 6–Oct. 9 8:00 am–8:00 pm

The **Rim Village Café** serves lighter fare including grab-and-go sandwiches, salads, soup, and snacks.
- Jan. 1–March 6 10:00 am–4:30 pm
- March 7–May 18 10:00 am–5:00 pm
- May 19–June 9 10:00 am–6:00 pm
- June 10–Sept. 5 9:00 am–8:00 pm
- Sept. 6–Oct. 2 10:00 am–6:00 pm
- Oct. 3–Nov. 5 10:00 am–5:00 pm
- Nov. 6–Dec. 31 10:00 am–4:00 pm

Crater Lake Lodge offers fine dining in a casual atmosphere, with gourmet cuisine made from local ingredients. Reservations are recommended for dinner (541-594-2255 ext. 3217) but are not taken for breakfast or lunch. Appetizers, drinks, and desserts are also available from 3:00 pm until closing in the Great Hall and on the back patio.
- May 20–Oct. 22
  - Breakfast 7:00 am–10:30 am
  - Lunch 11:30 am–2:30 pm
  - Dinner 5:00 pm–9:00 pm*
  - *10:00 pm June 10–Sept. 24

The **Mazama Village Store** sells groceries, camping supplies, firewood, and gasoline.
- May 27–June 2 10:00 am–5:00 pm
- June 3–Sept. 5 7:00 am–9:00 pm
- Sept. 6–Sept. 24 8:00 am–8:00 pm
- Sept. 25–Oct. 10 10:00 am–5:00 pm

Gifts & Books

At the park's two visitor centers, the Crater Lake Natural History Association sells books, maps, postcards, and souvenirs *(see page 8)*. Two other gift shops are operated by Xanterra Parks & Resorts:

The **Rim Village Gift Shop** has the same hours as the Rim Village Café *(see above)*.

The **Annie Creek Gift Shop** in Mazama Village has the same hours as the Annie Creek Restaurant *(see above)*. You can also shop online at www.craterlakelodges.com/shop.

Lodging

The park has two motels, both operated by Xanterra Parks & Resorts. For reservations, visit www.craterlakelodges.com or call 888-774-2728. For a list of lodging outside the park, ask at a visitor center.

Crater Lake Lodge (71 rooms) overlooks the lake at Rim Village. In 2016, it will be open May 20–October 22. Rooms begin at $180 per night. Advance reservations are highly recommended.

The Cabins at Mazama Village (40 rooms) are located 7 miles south of Rim Village. Rooms are $152 per night. Operating dates for 2016 are May 27–October 9.

Visitor Centers

At the park's two visitor centers, rangers can answer questions and help plan your trip.

The **Steel Visitor Center** at Park Headquarters is open daily 9:00 am–5:00 pm. A 22-minute film is shown on the hour and half-hour. It explores the park's significance and the lake's violent, volcanic past.

The **Rim Visitor Center** at Rim Village is open 9:30 am–5:00 pm late May to late September.

Exhibits

The **Sinnott Memorial Overlook**, perched on a rock ledge behind the Rim Visitor Center, features an indoor exhibit room and an open parapet with spectacular lake views. The overlook has a relief model and exhibits on the park's geology and lake research. Ranger talks are presented daily July 1 to September 5 *(see page 3)*. The overlook is open daily (weather permitting) from late June through October. Hours are 9:30 am–6:30 pm in July and August, 9:30 am–5:00 pm in June and September, and 10:00 am–4:00 pm in October. The overlook is located down a steep, historic walkway with stairs and, unfortunately, is not accessible to people with limited mobility.

Crater Lake Lodge features exhibits on tourism and the history and renovation of the lodge. The exhibits are open daily, around-the-clock, May 20–October 22. They are on the ground floor, west of the lobby.

Crater Lake National Park belongs to everyone. We all share responsibility in protecting it. Please take a moment to become familiar with these regulations. For a full list of the park's rules, visit www.nps.gov/crla/parkmgmt/lawsandpolicies.htm.

Drones
Operating remote-controlled aircraft in the park is prohibited.

Feeding Animals
Do not feed wildlife, including birds and squirrels. Exposing them to our food alters their behavior, is bad for their health, and can be dangerous for you. Store food properly. Generally, this means in your vehicle or a campground food locker. Backcountry campers should hang their food or use a bearproof canister.

Guns
Firearms are allowed in the park in accordance with Oregon state laws. They are prohibited, however, in all park buildings.

Hiking and Climbing
Stay on trails. This prevents erosion, protects vegetation, and protects other hikers. Hiking and climbing inside the caldera are strictly prohibited. The only exception is the Cleetwood Cove Trail, the only safe and legal access to the lake shore. Serious injuries and deaths have occurred from falls inside the caldera. The walls consist of unstable rocks and soils.

Marijuana
Possession of marijuana is prohibited. Oregon state laws allowing the use of marijuana do not apply in the park, an area of federal jurisdiction.

Overnight Parking
The park is open 24 hours, but overnight parking is not allowed, except in the park's campgrounds, for guests at the park's motels, and for backpackers (permit required).

Park Features
Leave rocks, plants, animals, and artifacts undisturbed for others to enjoy. It is prohibited to collect, deface, disturb, or destroy natural or cultural features. Do not approach, touch, feed, or disturb wildlife.

Pets
Pets are welcome in the park, but only in some areas. Pets on leash are allowed on the Godfrey Glen Trail, Lady of the Woods Trail, Grayback Drive, and Pacific Crest Trail. Leashes must not exceed 6 feet (1.8 meters), and only one pet per hiker is allowed. Pets are not permitted on other trails, or off-trail. Pets on leash (or otherwise physically restrained) are also allowed in picnic areas, parking lots, and campgrounds, on paved roads, and up to 50 feet (15 meters) away from paved areas. Popular places to walk a dog include Rim Village and Mazama Campground. Pets are not allowed inside buildings, including Crater Lake Lodge and The Cabins at Mazama Village. The above rules do not apply to service animals here to assist people with disabilities. Solid waste must be picked up immediately and disposed of properly, in a trash can or toilet.

Water Sports
Snorkeling, scuba diving, and long-distance swimming are not allowed in Crater Lake. In 2012, after reviewing the threats posed by aquatic invasive species, the park placed a ban on the use of snorkels, wet suits, diving gear, flotation devices, and other equipment that might serve as a vector for the introduction of non-native organisms. This includes rafts, canoes, and kayaks. Swimming is allowed at Cleetwood Cove and at Wizard Island, using standard swim suits.

Golden-Mantled Ground Squirrel

Help keep wildlife wild. Please DO NOT FEED!

Clark's Nutcracker

Boat Tour on Crater Lake

Sunset over Crater Lake

Trolley Tour on Rim Drive

Trolley Tours

Rim Drive is one of America's most scenic roads, but it's hard to appreciate the views with your eyes on the asphalt. Fortunately, you can leave the driving to someone else. Ranger-guided trolley tours circle Crater Lake daily. Tours begin and end at Rim Village, spend 2 hours traveling clockwise around the lake, and stop at a minimum of 5 scenic overlooks. See below for departure times and ticket prices. The buses are enclosed, climate-controlled, wheelchair accessible, and seat 25 passengers. They resemble old streetcars, but they run on modern technology: powered by compressed natural gas, they emit 30-40% less pollution than gasoline-powered vehicles. The trolleys are owned and operated by The Shuttle Inc. of Klamath Falls.

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 summer 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 Park Headquarters, from the visitor center or ranger station, between 9:00 am and 5:00 pm.

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 required for persons under 16 years of age and are strongly recommended for all cyclists.

Bicycling on park roads is physically demanding yet can be exceptionally rewarding. The most popular route is the 33-mile (53-km) Rim Drive, featuring spectacular views but also long, steep grades and climbs totaling 3,800 feet (1,158 meters). For details, pick up a bicycling handout at either visitor center.

Fishing

Originally, Crater Lake contained no fish. Between 1888 and 1941, however, 6 species were introduced. Today, only rainbow trout and kokanee salmon remain. Fishing is allowed at the bottom of the Cleetwood Cove Trail, where you'll find .25 miles (.4 km) of rocky shoreline. Wizard Island, reachable by tour boat, 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 and unobstructed views, the rim of Crater Lake is a great place to observe astronomical events. Discovery Point is a favorite spot to watch the sunrise. For sunsets and moonrises, try Watchman Overlook or hike to the top of Watchman Peak. Ask at a visitor center for sunrise and sunset times.

Swimming

Swimming is allowed in Crater Lake, but the water is cold! Most people swim for just a few 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 rocky; there are no beaches. Snorkeling, scuba diving, and wet suits are not allowed *(see page 2)*.

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, pika, wolf, porcupine, or bald eagle. Dawn and dusk are the best times to look.

Kids: You Can Become a Junior Park Ranger!

Are you between 6 and 12 years old? Do you want to learn while having fun at Crater Lake National Park? Here are 2 different ways:

- Pick up a free activity book at either visitor center. Explore the park, complete the activities, then return the book to a ranger to earn a Junior Ranger BADGE.
- Meet behind the Rim Visitor Center at 1:30, 3:00, or 4:30 pm (July 1–Sept. 5) and participate in a free, 20-minute activity. Complete one activity to earn a Junior Ranger PATCH.

Boat Tours

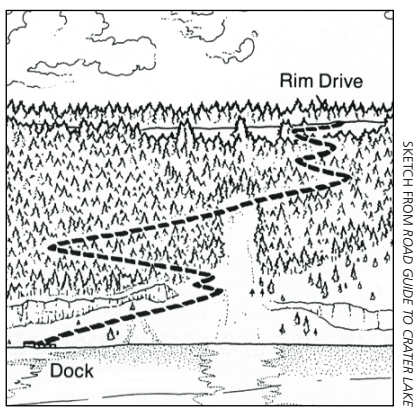
Join a park ranger for a cruise around Crater Lake. See the box below for departure times and ticket prices. Boat tours on Crater Lake are operated by Xanterra Parks & Resorts in partnership with the National Park Service.

Tickets
Each boat holds 37 passengers. 18 tickets for each tour (July 1–August 14 only) are available for advance purchase by calling 888-774-2728. The remaining 19 tickets for each tour (and all tickets from June 24–30) are available from automated kiosks inside Crater Lake Lodge and the Annie Creek Gift Shop. These tickets go on sale exactly 24 hours in advance of each tour. Sales continue until the tour is sold out or until 2 hours remain before departure. At that time, if a tour is not sold out, remaining tickets can be purchased from a ticket booth (open daily at 7:45 am) at the top of the Cleetwood Cove Trail, until 45 minutes before departure. Ticket holders should arrive at the trailhead at least 45 minutes before their tour to allow time to hike down the 1.1-mile (1.7-km) trail to the lake.

Types of Tours
Standard tours are 2 hours long. They are ranger-narrated and circle the entire lake (but do not stop at Wizard Island). Wizard Island Tours are 5 hours long. They consist of a standard tour plus a 3-hour stay on the island, where passengers disembark to hike, swim, fish, and relax on their own. Wizard Island Shuttles are 4 hours long. They include a 1-hour (round-trip) ride to the island plus a 3-hour stay there. They do not circle the entire lake and do not include a narrated tour. (Note: For people wishing to spend 6 hours on the island, up to 6 tickets on the 8:30 am shuttle and up to 4 tickets on the 9:45 am tour are available for that purpose.) See page 4 for details on the island's two 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.
- ☑ Bring a jacket. Weather on the lake can be windy and chilly.
- ☑ 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 hike is steep and strenuous: in 1.1 miles (1.7 km) it 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. The trail is usually open from mid-June to late October, but this year will close on August 15 for construction *(see page 1)*.



SKETCH FROM *ROAD GUIDE TO CRATER LAKE*

The Cleetwood Cove Trail drops 700 feet (213 meters) to the lake shore.

Ranger-Led Activities

Ranger-Led Activities	Dates & Times
Ranger Talks at Rim Village Join a ranger to deepen your understanding of Crater Lake. Topics vary; check posted schedules. Meet at the Sinnott Memorial Overlook for the talks at 11:30, 1:00, and 2:30. Meet on the back porch of Crater Lake Lodge (accessible to wheelchairs) for the 4:00 talk. (20 minutes)	July 1–Sept. 5 **11:30 am** July 1–Sept. 5 **1:00 pm** July 1–Sept. 5 **2:30 pm** May 20–Oct. 22 **4:00 pm** ♿ (Additional talks may be offered Sept. 6–30. Check posted schedules.)
Junior Ranger Activity ♿ Kids participate in a ranger-led activity to learn about Crater Lake and earn a Junior Ranger patch. Meet behind the Rim Visitor Center. Geared for ages 6 to 12. (20 minutes)	July 1–Sept. 5 **1:30 pm** July 1–Sept. 5 **3:00 pm** July 1–Sept. 5 **4:30 pm**
Afternoon Hike Hike with a ranger to discover Crater Lake. Trails vary by day of the week. See page 4 for trail details. For Garfield Peak, meet on the back porch of Crater Lake Lodge. For Sun Notch and Plaikni Falls, meet at the trailhead. Be sure to carry drinking water. Sunday, Wednesday: **Sun Notch** (1 hour, easy, great views of the Phantom Ship) Mon., Thurs., Sat.: **Plaikni Falls** (1.5 hours, easy, hike to a hidden waterfall) Tuesday, Friday: **Garfield Peak** (2.5 hours, 1000' elevation gain, spectacular views)	July 1–Sept. 16 **2:00 pm** (Additional hikes may be offered Aug. 15–Sept. 5. Check posted schedules.)
Watchman Peak Sunset Hike Ascend to a breathtaking viewpoint and watch the sun go down over the Cascade Mountain Range. Meet at Watchman Overlook, a parking area with wooden fences 3.8 miles (6.1 km) northwest of Rim Village. Flashlights are not needed. See page 4 for trail details. (1.5 hours)	July 15–25 **7:30 pm** July 26–Aug. 6 **7:15 pm** August 7–17 **7:00 pm** August 18–26 **6:45 pm** Aug. 27–Sept. 4 **6:30 pm** Sept. 5–12 **6:15 pm** Sept. 13–18 **6:00 pm**
Evening Program ♿ 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 1–31 **9:00 pm** August 1–20 **8:30 pm** Aug. 21–Sept. 5 **8:00 pm** (Additional programs may be offered Sept. 6–Oct. 9. Check posted schedules.)
Rim Drive Trolley Tour ♿ Circle the lake on a ranger-narrated tour of Rim Drive. See the top of this page for more information. Tickets are sold from a trolley parked by the Community House in the middle of Rim Village. Tickets may be purchased the day of the tour, or the day before, from 9:00 am to 3:00 pm. To reserve tickets further in advance, call 541-882-1896 or visit www.craterlaketrolley.com. Tours cover a variety of topics. (2 hours)	July 1–Sept. 5 **10:00 am** **11:00 am** **12:00 pm** **1:00 pm** **2:00 pm** **3:00 pm** June 24–30 & Sept. 6–Oct. 16 **10:30 am** **12:00 pm** **1:30 pm** **3:00 pm**
Crater Lake Boat Tour 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)	June 24–Aug. 14* Standard Tours: **9:30 am**, **10:00 am**, **12:00 pm**, **1:15 pm**, **3:30 pm**, **3:45 pm** Wizard Island Tours: **9:45 am**, **12:45 pm** Wizard Island Shuttles: **8:30 am**, **11:30 am** *Boat tours typically run through mid-September but will be ending early this year due to construction *(see page 1)*.

Ticket Prices		
$27	Adult (age 14 to 59)	
$24	Senior (age 60 and up)	
$17	Child (age 6 to 13)	
Free	Young Child (under 6 years)	
Ask about family and group discounts		

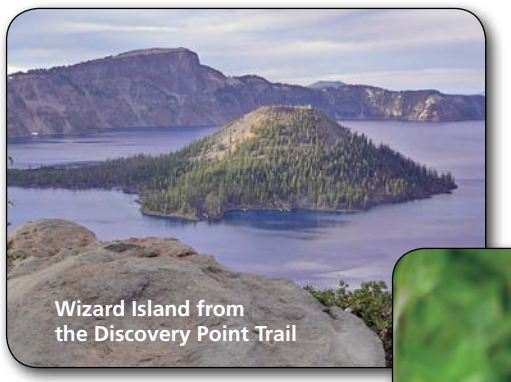
Ticket Prices		
Standard Tour	$40	Adult (age 13 and up)
	$27	Child (age 3* to 12)
Wizard Island Tour	$57	Adult
	$36	Child
Wizard Island Shuttle	$32	Adult
	$20	Child

*Kids must be at least 3 years old to take a boat tour. Engine noise, sun exposure, wind, and occasional rough water make tours unpleasant for infants and toddlers.

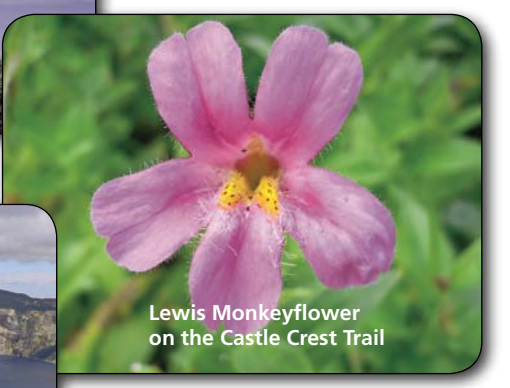
Activities are free of charge except for trolley & boat tours. Programs are subject to cancellation due to weather or unforeseen circumstances.

Let's Go Hiking!

Hi, I'm Ranger Emily. We have 90 miles (145 km) of hiking trails here at Crater Lake. Our most popular day hikes are listed on this page. 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:



Wizard Island from the Discovery Point Trail



Lewis Monkeyflower on the Castle Crest Trail

Hiker atop Garfield Peak

- No hiking or climbing inside the caldera! The walls are dangerously steep and unstable. The one exception is the Cleetwood Cove Trail, the only legal access to the lake shore.
- Leave all rocks, plants, animals, and artifacts undisturbed for the enjoyment of future hikers.
- Overnight backpacking requires a permit, available at Park Headquarters between 9:00 am and 5:00 pm. Some areas are not open to backcountry camping.
- Pets are allowed on the Godfrey Glen Trail, Lady of the Woods Trail, and Pacific Crest Trail. Pets must be leashed; only one pet per hiker *(see page 2)*.
- To protect vegetation and prevent erosion, please stay on the trails.

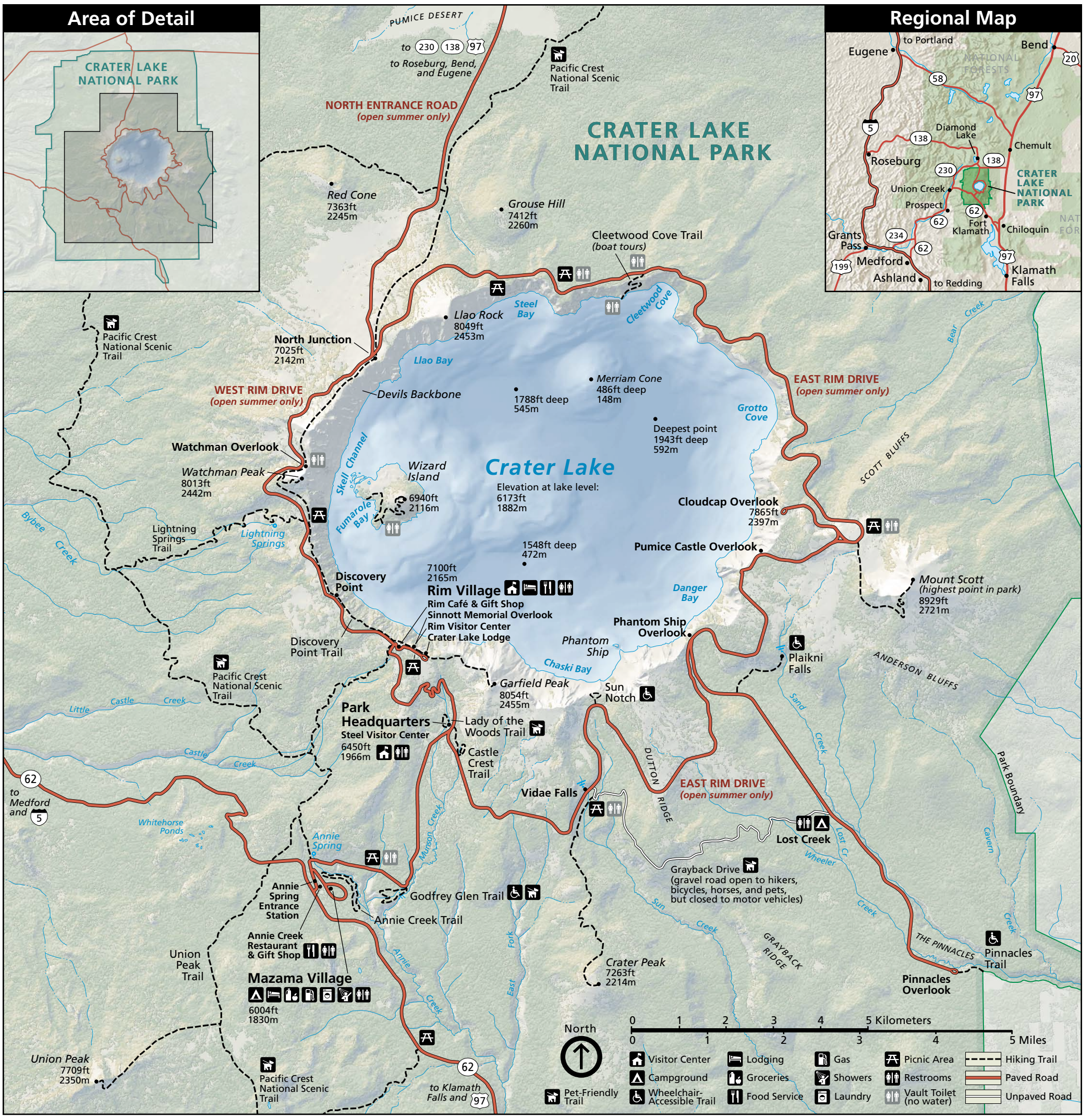
Castle Crest	Lady of the Woods	Sun Notch	*Trail*	The Pinnacles	Godfrey Glen	Plaikni Falls
0.5 miles (0.8 km) loop trail	0.7 miles (1.1 km) loop trail	0.8 miles (1.3 km) loop trail	*Roundtrip*	0.8 miles (1.3 km)	1.1 miles (1.8 km) loop trail	2.0 miles (3.2 km)
100 feet (30 meters)	120 feet (37 meters)	150 feet (46 meters)	*Elevation Gain*	10 feet (3 meters)	50 feet (15 meters)	100 feet (30 meters)
20 minutes	**30 minutes**	**30 minutes**	*Time*	**30 minutes**	**30 minutes**	**1 hour**
Flowers, Meadow, Creek	**Historic Architecture**	**Views of Phantom Ship**	*Highlight*	**Volcanic Spires**	**Peaceful Forest**	**Waterfall, Flowers**
Loop trail through a lush meadow. Abundant wildflowers in July. 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.	Short uphill walk through a meadow to the rim of Crater Lake. Great views of the Phantom Ship. Use caution near cliff edges. Accessible to strong wheelchair users with assistance.	*Description*	Easy walk along the rim of Pinnacle Valley. Great views of volcanic spires. Use caution near cliffs. Trail ends at park boundary. Accessible to wheelchair users with assistance. Open to bicycles.	Easy stroll through an old-growth forest, with some canyon views. Dirt path; accessible to wheelchair users with assistance. Self-guiding brochures are available at the trailhead.	Easy walk through an old-growth forest to a waterfall. Many flowers in July. The first ¾ is accessible to wheelchair users with assistance, but the final, short climb to the falls might be too steep.
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.	East Rim Drive, 4.4 miles (7.1 km) east of Park Headquarters.	*Trailhead Location*	End of the Pinnacles Road, 6 miles (9.7 km) southeast of the Phantom Ship Overlook.	2.4 miles (3.9 km) south of Park Headquarters.	Pinnacles Road, 1.2 miles (1.9 km) southeast of the Phantom Ship Overlook.
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.	This U-shaped valley was carved by glaciers that once flowed down Mt. Mazama.	*Nature Note*	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.	Snowmelt, not Crater Lake, is the source of Plaikni Falls' water.
Easy				***Easy***		

The Phantom Ship from Sun Notch

Plaikni Falls

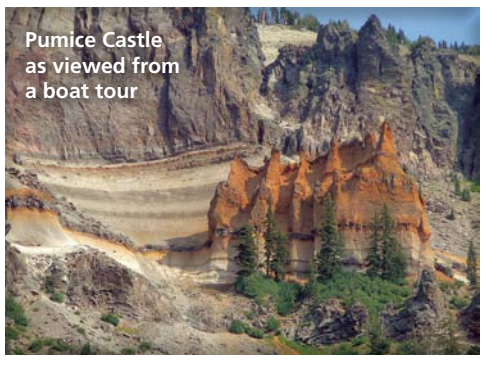
Discovery Point	*Trail*	Fumarole Bay	Watchman Peak	Annie Creek
2.0 miles (3.2 km)	*Roundtrip*	1.7 miles (2.7 km)	1.6 miles (2.6 km)	1.7 miles (2.7 km) loop trail
100 feet (30 meters)	*Elevation Gain*	150 feet (46 meters)	420 feet (128 meters)	200 feet (61 meters)
1 hour	*Time*	**1 hour**	**1 hour**	**1½ hours**
Lake Views	*Highlight*	**Swimming, Fishing**	**Panoramic Views**	**Creek, Canyon, Flowers**
Trail along the rim of Crater Lake through a pretty forest of whitebark pines and mountain hemlocks. Fine views of the lake and Wizard Island. Use caution near cliff edges.	*Description*	Rocky trail on Wizard Island to a shallow cove with clear water. Upon reaching Fumarole Bay, the maintained trail ends but a rough path continues to the far end of the cove.	Moderate ascent to a fire lookout above Wizard Island. Spectacular views in all directions. Great place to watch the sunset. Trail may be closed until mid-July due to snow.	Moderately strenuous hike through a deep, stream-cut canyon. Lots of water, wildflowers, and sometimes wildlife. Self-guiding brochures are available at the trailhead.
West end of Rim Village, where the paved walk becomes a dirt path. Can also start from Discovery Point.	*Trailhead Location*	Wizard Island dock, reachable only by boat tour or shuttle from Cleetwood Cove. See page 3 for information.	3.8 miles (6.1 km) northwest of Rim Village. Park at the viewpoint surrounded by wooden fences.	Mazama Campground, behind the amphitheater, located between loops D and E. Limited parking in E Loop.
Gold prospector John Wesley Hillman first spotted Crater Lake near this point in 1853.	*Nature Note*	Abundant lichen on the tree trunks is an indication of excellent air quality.	Built in 1932, the peak's historic fire lookout is still used by rangers today.	The spring at the head of Annie Creek is the source of the park's drinking water.
		Moderate		

Wizard Summit	Cleetwood Cove	Garfield Peak	*Trail*	Mount Scott	Crater Peak	Union Peak
2.2 miles (3.5 km)	2.2 miles (3.5 km)	3.6 miles (5.8 km)	*Roundtrip*	4.4 miles (7.1 km)	6.5 miles (10.5 km)	9.8 miles (15.8 km)
760 feet (232 meters)	700 feet (213 meters)	1,010 feet (308 meters)	*Elevation Gain*	1,250 feet (381 meters)	765 feet (233 meters)	1,600 feet (448 meters)
1½ hours	**1½ hours**	**2 to 3 hours**	*Time*	**3 hours**	**3½ hours**	**5 to 6 hours**
Views, Summit Crater	**Swim, Fish, Boat Tours**	**Panoramic Views**	*Highlight*	**Panoramic Views**	**Forest, Views, Solitude**	**Panoramic Views**
Rocky climb to the top of Wizard Island. Spectacular lake views, interesting geology. A 0.3-mile (0.5-km) path leads around the 90-foot-deep (27-meter) crater at the summit.	The only legal access to the shore of Crater Lake. Strenuous trail with a steep grade. See page 3 for details. In 2016, the trail will close for the season on August 15 for construction *(see page 1)*.	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.	*Description*	Gradual ascent of the park's highest peak. Great views in all directions. Best in the morning, when the light is ideal for lake viewing. May be closed until mid-July due to snow.	Moderate-to-strenuous hike 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.	Long forest walk followed by a very steep climb. Great views from the top and interesting geology, but no view of Crater Lake. Top section may be impassable until mid-July due to snow.
Wizard Island dock, reachable only by boat tour or shuttle from Cleetwood Cove. See page 3 for information.	North side of the lake, 11 miles (17.6 km) from Rim Village if traveling clockwise on Rim Drive.	East end of Rim Village. Follow the paved promenade behind Crater Lake Lodge.	*Trailhead Location*	East Rim Drive, 14 miles (22.5 km) east of Park Headquarters.	East Rim Drive, 3 miles (4.8 km) east of Park Headquarters at the Vidae Falls Picnic Area.	Highway 62 at the Pacific Crest Trailhead, 1 mile (1.6 km) west of the Crater Lake road junction.
The dead trees at the summit have been killed by dwarf mistletoe, a parasitic plant.	In August, the average water temperature at the lake's surface is 59°F (15°C).	Rocky slopes along the trail are home to American pikas and yellow-bellied marmots.	*Nature Note*	Mt. Scott is the park's highest peak—8,929 feet (2,721 meters) in elevation.	Upper Klamath Lake is the largest in Oregon, but its average depth is only 14 feet.	Union Peak is the core of an old volcano eroded by glaciers during the last Ice Age.
Strenuous				***Strenuous***		



Highlights of the Rim Drive

Rim Drive is a 33-mile (53-km) road that encircles Crater Lake. It is one of America's most scenic byways, with spectacular views in all directions. The full loop is typically open from early July to late October. It can be driven, without stopping, in about an hour, but plan on at least 2 to 3 hours to enjoy the varied sights. The road is narrow, so buses and motorhomes should use caution. There are more than 30 scenic pullouts along the route, many of which have roadside exhibits. Be sure not to miss these 7 "must-see" stops. For more information, pick up the excellent *Road Guide to Crater Lake National Park* (48 pages, $6.99) at either visitor center.


Pumice Castle as viewed from a boat tour

Discovery Point

Imagine seeing Crater Lake by accident. It was near this spot, on the back of a mule in 1853, that gold prospector John Hillman became the first European-American to stumble across what he called "Deep Blue Lake."

Watchman Overlook

This pullout offers an unmatched view of Wizard Island, a cinder cone that erupted out of Crater Lake approximately 7,300 years ago. 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

This overlook sits at the end of a 1-mile (1.6-km) spur road, the highest paved road in Oregon. 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 features: a layer of orange pumice rock that has been eroded into the shape of a medieval castle. Watch carefully for this unmarked viewpoint, located 1.1 miles (1.8 km) west of the Cloudcap Overlook junction and 2.4 miles (3.9 km) east of the Phantom Ship Overlook.

Phantom Ship Overlook

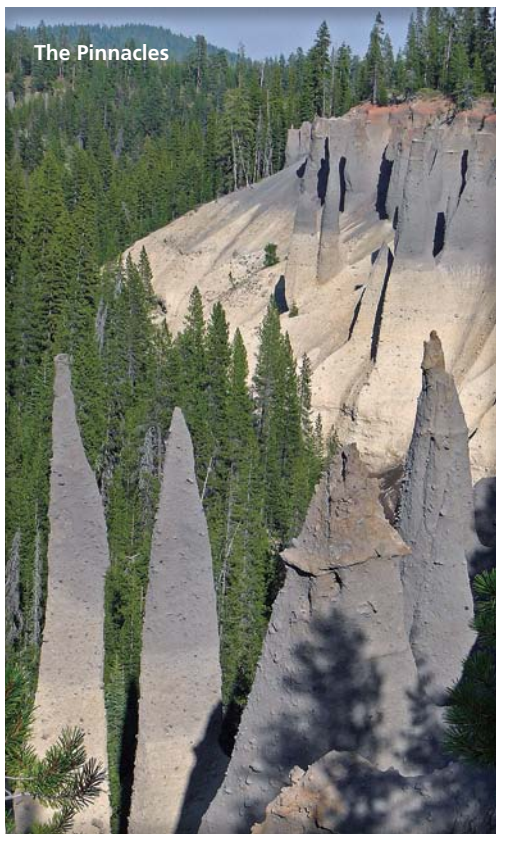
Nestled against the shore, Crater Lake's "other island" escapes detection by many park visitors. Though it resembles a small sailboat, the island is as tall as a 16-story building. It's made of erosion-resistant lava, 400,000 years old—the oldest exposed rock within the caldera.

Pinnacles Overlook

This overlook is well worth the 6-mile (10-km) detour from Rim Drive. Colorful spires, 100 feet (30 meters) tall, are being eroded from the canyon wall. The Pinnacles are "fossil fumaroles" where volcanic gases once rose up through a layer of volcanic ash, cementing the ash into solid rock.

Vidae Falls

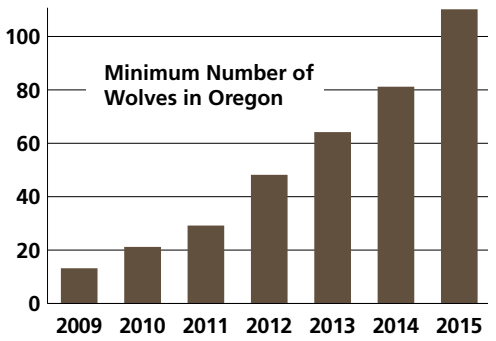
Look for this cascading waterfall between Phantom Ship Overlook and Park Headquarters. A spring-fed creek tumbles over a glacier-carved cliff and drops 100 feet (30 meters) over a series of ledges. In summer, wildflowers flourish in the cascade's spray.


The Pinnacles

Wolves Return to the Oregon Cascades

OREGON DEPT. OF FISH & WILDLIFE

In 2015, GPS (Global Positioning System) collars tracked the movements of 21 of the state's wolves. Satellite data reveals that the average size of a pack's territory in Oregon is 285 square miles (738 km²).



The recovery of Oregon's wolf population has been dramatic. At the end of 2015, the state was home to at least 110 wolves.

OREGON DEPT. OF FISH & WILDLIFE

Wolves are much bigger than their coyote cousins. An average adult weighs 100 pounds (45 kg), versus 30 pounds (14 kg) for a coyote. Their prints are 4 to 5 inches (10-13 cm) long and wide.

In the fall of 2011, a wolf known as OR7 *(see sidebar at right)* made the national news when he journeyed from his birthplace in northeast Oregon to become the first confirmed wolf in the Oregon Cascades since 1946. Five years later, at least 10 wolves now live in the western half of the state, mainly in the vicinity of Crater Lake National Park. While your chances of spotting a wolf in this area are still remote, sightings are becoming more frequent. Firefighters glimpsed wolves on several occasions in the park's northwest corner last summer, and there have been multiple reports of wolves in the park's southeast corner this spring. If you see a wolf in the park, let us know!

Gray wolves *(Canis lupus)* once roamed across Oregon—and most of the contiguous US—but were hunted, poisoned, and trapped until, by 1960, only a few hundred remained in northern Minnesota. Like mountain lions and other predators, they were considered a threat to livestock and more "desirable" wildlife, such as deer and elk. From 1843 to 1946, anyone who killed a wolf in Oregon was eligible for a cash bounty from the state government and various organizations. In 1973, however, the passage of the Endangered Species Act paved the way for the wolves' return. A small population migrated on its own from Canada into Montana, and in 1995-96, the US Fish & Wildlife Service reintroduced wolves from Canada into Yellowstone National Park and central Idaho. By 2009, two packs had become established in northeast Oregon, founded by Idaho-born wolves that had crossed the Snake River.

Since then, Oregon's population has climbed dramatically. The most recent census counted a minimum of 110 wolves, in at least 12 packs. Over 90% are still in the state's northeast corner, but more and more lone wolves are following OR7's example and heading west to the Cascades in search of mates and to start a family. Wolves will settle wherever they can find food. They primarily eat deer and elk, but will also catch smaller animals including rabbits, beavers, grouse, ravens, porcupines, and fish. Occasionally, they prey on livestock—in 2015, wolves in Oregon killed 3 cattle, 10 sheep, and one guard dog—in which case ranchers are compensated for their loss and the offending wolves, if repeat offenders, are put down. Wolves generally fear and avoid people, however; none of the wolves introduced in the 1990s, or any of their descendants, has ever attacked a human.

The rapid recovery of Oregon's gray wolf population is a testament to the effectiveness of the Endangered Species Act, the new appreciation that Americans have for the role of predators in the ecosystem, and the resiliency of this hardy species. For more information—and to sign up for email updates—visit www.dfw.state.or.us/wolves.

OREGON DEPT. OF FISH & WILDLIFE

Despite their name, gray wolves range in color from white to black. Here, a state wolf biologist monitors a male as he wakes up from anesthesia after being outfitted with a GPS collar.

OREGON DEPT. OF FISH & WILDLIFE

A remote camera spotted OR7 outside Crater Lake National Park on May 3, 2014.

OR7's Journey

OR7 is the founder of the "Rogue Pack"—the first pack of wolves to inhabit the Oregon Cascades in over 50 years. He was born in 2009 in the state's northeast corner, and in 2011 became the 7th wolf in Oregon to be outfitted with a GPS tracking collar (that's how he got his name).

In the fall of 2011, like many 2 year-olds, he left his family and ventured out on his own. He traveled further than most, covering 1,200 miles on a journey that took him across central Oregon, past Crater Lake National Park, and into California, where he became the first wolf recorded in that state since 1924. OR7 returned to Oregon in 2013 and found a partner—a black-coated female who had also, apparently, migrated from northeast Oregon. She lacks a collar (and thus an official name) but has been spotted with OR7 in photos taken by remote camera. In the spring of 2014, she gave birth to at least 3 pups, and at least 2 more the following spring. Collectively, the family is known as the Rogue Pack, named for the Rogue River, which flows west from Crater Lake National Park to the Pacific Ocean.

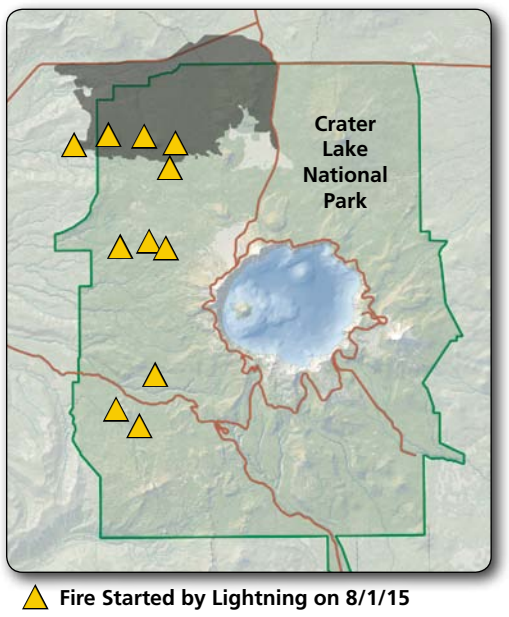
OR7's GPS collar stopped working in June of 2015, but wildlife biologists hope to recapture him soon to replace the batteries. Or perhaps they'll fit a new collar on one of his offspring. His oldest pups, now full-grown, might leave the pack this fall, starting their own journey to find a new home and carry on the legacy of the species.

Fire Burns 20,960 Acres

Drought Conditions Fuel the Largest Fire in the Park's Recorded History

If you drive through the park's North Entrance this summer, you'll notice that one side of the road is lined with charred, blackened trees. The ground here was burned intentionally in August of 2015 as part of a successful effort to contain the largest fire in the park's recorded history. Dubbed the National Creek Complex, it affected 14,639 acres (5,924 hectares) of the park and 6,321 acres (2,558 hectares) in two neighboring national forests.

A dry thunderstorm ignited the blaze. On August 1, lightning started 10 separate fires in the park and another just beyond the park's boundary. Most of the fires were small and would soon be extinguished by crews on foot, helicopters carrying water, and smokejumpers parachuting in from airplanes. But three of the fires—all near the headwaters of National Creek, a tributary of the Rogue River—spread rapidly, before they could be reached. The largest had grown to 15 acres (6 hectares) within two hours of its detection.



Fire Started by Lightning on 8/1/15

Area Burned by the National Creek Complex

Lightning ignited 10 fires in the park (and one just outside the park) on August 1, 2015. Several of them combined to form the National Creek Complex. Over the next two months, they burned an area 1½ times the size of Crater Lake.

Lightning may have triggered them, but the real culprit—and what caused the fires to expand so quickly—was drought. The winter of 2014-15 was the park's warmest on record: only 16 feet (5 meters) of snow fell at Park Headquarters, an all-time low. The park's average annual snowfall is 43 feet (13 meters), which typically blankets the park until June. In 2014-15, winter snow cover was minimal, and, by summer, the park was a tinderbox. Recognizing this, park managers decided to suppress all fires that arose in 2015. Most years, they look for opportunities to supervise the growth of some fires for the benefit of the ecosystem, since fire plays a vital role in maintaining biodiversity and the health of the forest. But they must use caution: the park's forests are unnaturally dense with live trees and dead wood, a legacy of the park's old policy—in effect from 1902 to 1978—of extinguishing all ignitions immediately. During periods of drought, the risk of a large, high-intensity fire potentially outweighs its ecological benefit. If one were to escape containment, it could endanger human life and property.

That's why the next turn of events caused concern. In the week after the thunderstorm, the fires of National Creek had grown to 300 acres (121 hectares). Crews on the ground were making good progress containing them, digging a line in the soil, 1 to 2 feet (30-60 cm) wide, around their perimeter. But the park had few resources with which to attack the fires directly; aircraft and personnel in Oregon were spread thin, combatting 50 other fires that had ignited in the state that same week. On the afternoon of August 8, strong and shifting winds caused one of the National Creek fires to jump its northern containment line. It began racing toward the park's boundary, in the direction of Diamond Lake Resort. It traveled in leaps and bounds: the burning embers of twigs and lichens were lifted by convective winds into the sky, starting new fires where they landed. One such "spot fire" was discovered 1½ miles (2.4 km) ahead of the main blaze!

Changing tack, the park decided that the safest and surest course of action would be to use existing roads and natural barriers (like the Pumice Desert) to halt the fire's spread to the north and east. They also decided to "fight fire with fire." Highway 230 and the park's North Entrance Road were closed to traffic while crews used "drip torches" to burn a strip of land parallel to the pavement, making it even harder for the fire to bridge the road. It worked. The road corridor checked the advance of the main fire, while spot fires that leapfrogged the road were quickly suppressed.

The National Creek Complex continued to swallow acreage through September, as firefighters turned their attention to its south and west flanks, using minimum-impact techniques to avoid causing undue damage to live trees and sensitive wildlife habitat. When it was all said and done, the price tag stood at $22 million, but the operation was a success. No structures were damaged, no lives were lost, and only minor injuries were sustained (even though, at the fire's peak, more than 1,000 firefighters and other personnel—from around the country and from many different state and federal agencies—were involved in its containment). And in the end, the fire will bring long-term good to the park's plants and animals, providing new habitat for birds, mammals, shrubs, and grasses that thrive when fire plays its natural role in modifying the landscape of the park.

As the fire spread north and east toward the park boundary, crews intentionally burned the ground along Highway 230 and the North Entrance Road. They burned a swath 150 feet (46 meters) wide, creating a "fuel break" to stop the fire's progress. In this photo, firefighters work to ensure that the park's North Entrance sign is not engulfed by the operation.

The fire burned with particular intensity near Boundary Springs—the headwaters of the Rogue River—in the park's northwest corner. The trail to the springs will be closed this summer because of downed trees, damage to the trail, and hazardous conditions (fire-weakened trees that could fall on hikers). When the trail reopens in 2017, it will be a fantastic place to observe the recovery of life to the area.

Will Climate Change Keep Crater Lake From Mixing?

Computer Simulation Predicts That Warming Water Will Slow the Lake's Circulation

Have you dipped your toes into Crater Lake recently? While it's still refreshingly cold, the water is not as frigid as you may remember from your childhood. The lake's summer surface temperature has climbed noticeably in the past 50 years, reaching a record high in 2015 of just over 60°F (15.6°C). Like other large lakes in North America, Crater Lake is heating up—not from an increase in volcanic activity under the lake, but from warming air above it. Now, a study published by the US Geological Survey is predicting that continued warming of the lake's surface will, in the decades to come, interfere with how the lake mixes: water near the surface will reach the bottom less often. In turn, this could reduce the circulation of oxygen and nutrients in the lake and might have consequences for the lake's renowned clarity and the survival of its aquatic plants and animals.

The vertical mixing of water is an important process in deep lakes. In Crater Lake, creatures living on the bottom (mostly worms and insects) rely on mixing to replenish their supply of oxygen, while life forms near the surface (such as phytoplankton and zooplankton) depend on mixing to provide them with critical nutrients. In the lake's deep basins, dissolved oxygen is depleted over time; it's consumed by the decomposition of organic material that sinks down from above. This material (dust, pollen, and the remains of aquatic organisms) contains nitrates and other nutrients, which are in short supply near the surface, owing to the lake's lack of tributary streams. When Crater Lake mixes, oxygen-rich water is transported down from the surface, while nutrient-rich water rises up from the depths.

The process by which Crater Lake mixes is different from that of most other lakes. Most lakes "turn over" once or twice each year, when the uppermost layer of water undergoes a temperature change that allows it to sink to the bottom, usually with the help of the wind. Since Crater Lake is so deep and cold, however, seasonal mixing is able to circulate only the upper 650 feet (200 meters) of the water column. In order for the water at your toes to travel to the deepest basin—1,943 feet (592 meters) deep—a special set of conditions is required: a surface layer that is colder (but not too much colder) than the water below it, and a storm capable of producing strong, steady winds for several days at time. The wind pushes the cold water against the shore, where some of it is forced down. If it's submerged far enough, to the point where it becomes denser than the water around it, it will continue to sink on its own. Currently, a plume of cold water reaches the floor of Crater Lake roughly every other year: there have been 11 "deep-water mixing events" in the past 23 winters.

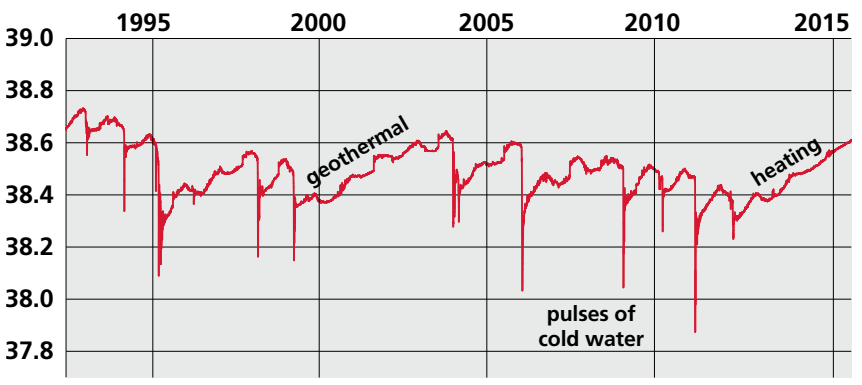
A weather buoy on Crater Lake records the surface water temperature, air temperature, humidity, wind speed, and wind direction. The buoy is anchored to the bottom, directly above the lake's deepest point, and is visible from several pullouts on the East Rim Drive—see if you can spot it!

To find out if warming temperatures might someday alter the lake's patterns, researchers from the US Geological Survey, National Park Service, and the University of Trento in Italy ran a series of simulations. They employed a computer model, first used to study Lake Baikal in Siberia, that can predict when a deep-water mixing event will occur. The program requires the input of three variables—wind speed, wind duration, and surface temperature—along with detailed information about the lake's geometry. After calibrating the model to ensure that it could accurately simulate past mixing events, the team let it run into the future. They tested six different sets of variables, generated by three different weather models each considering two possible futures: an optimistic scenario in which global greenhouse-gas emissions peak in the year 2040 and then sharply decline, and a "business-as-usual" scenario in which emissions keeping climbing through 2100.

All six simulations arrived at the same basic conclusion, that deep-water mixing events will become less frequent in the future. Those based on the optimistic scenario predicted, on average, that in the second half of this century the time period between mixing events will increase to 3.4 years. Those based on the "business-as-usual" scenario, in which no attempt is made to curb greenhouse-gas emissions, estimated an average interval of 6.1 years. In each case, the reason behind the reduction in mixing was the same: in the coming decades, there will be fewer years in which the lake's surface gets cooler than its depths. Presently, "reverse stratification" happens in 80-90% of Crater Lake's winters, but by 2100, all the simulations predict that it will occur in less than 50% of years. As a result of warmer air temperatures, the lake's surface will fail to cool sufficiently for deep-water mixing to take place, no matter how hard the wind blows in January and February.

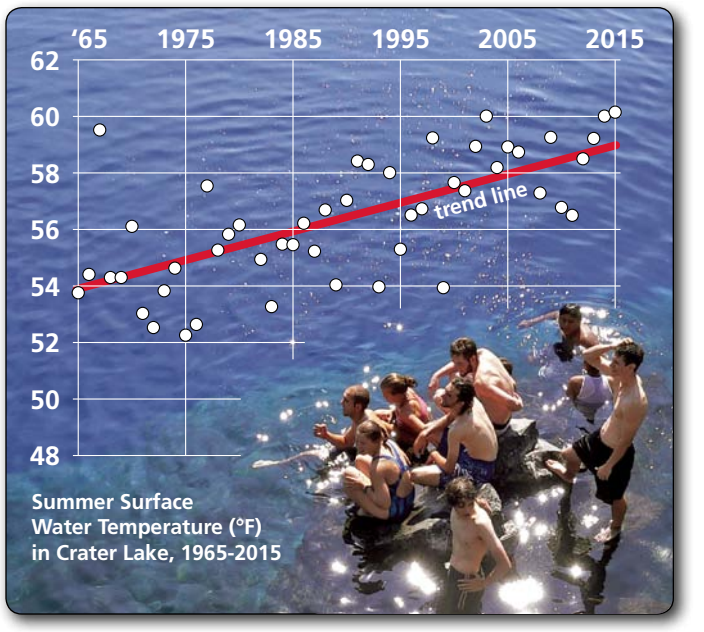
So what does this mean for the lake's ecology? The study stopped short of making any guesses, but one possibility is that there could be a wider variance in water clarity. Some summers, with fewer nutrients being upwelled to the surface—and less phytoplankton clouding the water column—the clarity of the lake might actually increase! Crater Lake is already one of the cleanest and clearest bodies of water in the world; its beautiful blue color might actually intensify in the future after a series of non-mixing years. However, when the lake does eventually mix to the bottom, stirring up a larger-than-ever accumulation of nutrients, the result could be an algae bloom, causing a dramatic reduction in water clarity. And as for the creatures who dwell in the dark on the bottom of the lake, their numbers might decline without the regular arrival of oxygenated water from the surface. Over time, "dead zones" could develop in the lake's deep basins, so starved of oxygen that no animals could survive.

Whatever the ultimate impacts will be—and right now the above hypotheses are just speculation—what is certain is that Crater Lake is not immune from the reach of climate change. Despite its location in the middle of a national park—far from development, industry, and direct sources of pollution—the lake is vulnerable to forces beyond its boundary and beyond the ability of the National Park Service to mitigate or control.



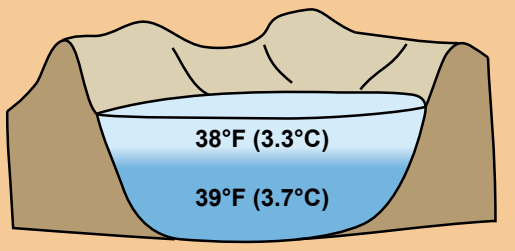
Water Temperature (°F) at the Bottom of Crater Lake, 1992–2015

How can we tell when water from the surface sinks to the bottom? In 1992, the park and researchers from Oregon State University deployed temperature sensors at 18 different depths in the lake. They are attached to a long rope suspended near the lake's weather buoy. The data from the lowest sensor—1,900 feet (580 meters) deep—is shown here. When a pulse of cold surface water hits the floor of the lake, there is a sudden downward spike in temperature. In between mixing events, the water at the bottom slowly warms back up due to geothermal heating from below. Deep-water mixing has occurred in 11 of the past 23 years in Crater Lake, but it's unlikely to happen as often in the future.



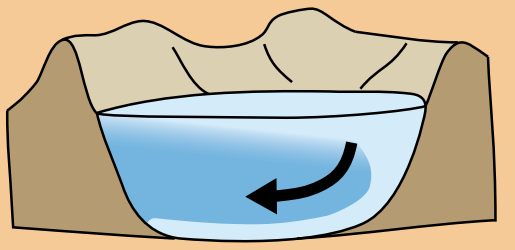
Crater Lake is getting warmer. Since 1965, when we began keeping track, the average summer water temperature at the surface has increased by 5.0°F (2.8°C). While this might be good news for swimmers, it's probably bad news for the lake's other life forms. Warm surface water has trouble mixing with the cold water below it, limiting the circulation of oxygen and nutrients in the lake.

How Crater Lake Mixes

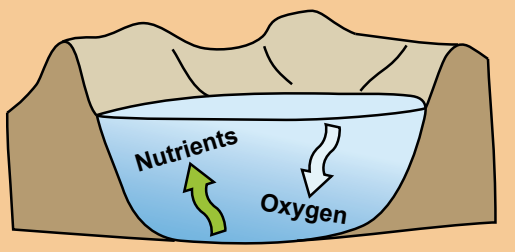


For deep-water mixing to occur in Crater Lake, the surface layer must be slightly cooler than the water below it. This is most likely to happen in January, February, or March.

The next requirement is a big winter storm, several days long, with steady winds of perhaps 20-40 mph (32-64 km/hr). The wind pushes the surface layer against the shore, forcing some of that water downward.



If the surface layer is pushed deep enough (to the point where it's denser than the water below it*), it will continue to descend on its own. In a major mixing event, more than 500 billion gallons of water (1.9 trillion liters) sink to the bottom of the lake—that's 10% of the lake's total volume!



Water from the surface carries oxygen, important for the survival of bottom-dwelling creatures. In turn, nutrient-rich water on the bottom is displaced upward. It's needed by aquatic plants and animals that live closer to the surface.

**This part gets complicated. The density of water depends on temperature and pressure. At the surface of the lake (at atmospheric pressure), water is most dense at 39°F (4°C). Underwater, where the pressure is greater, slightly colder water will weigh more. At the lake's midpoint—1000 feet (305 meters) deep—the temperature of maximum density is 38°F (3.4°C). On the bottom, the "TMD" is 37°F (2.9°C).*

Kate Wilson of Raleigh, North Carolina, snapped this photo of a black bear crossing the Pinnacles Road on July 7, 2015.

Wanted: Your Wildlife Observations

Scientists need your help! If you spot any interesting animals during your Crater Lake visit, or if you observe any unusual behavior, please let us know! Your observations will help us learn which animals live in the park and how they use it. In 2015, park visitors and employees submitted 157 observations of 45 different species, including the black-backed woodpecker, yellow-bellied marmot, long-tailed weasel, western screech owl, and broad-footed mole.

To report your sighting, send an email to craterlake@nps.gov or find a ranger at a visitor center. Let us know the date and precise location of your encounter, a detailed description of what you saw, as well as your name and contact info, in case we have follow-up questions.

And if you captured any photos, send them along (ideally with permission for us to use them in reports and publications). Photographic evidence can be very important in confirming the identity of some species. Just remember that approaching, feeding, or disturbing wildlife is strictly prohibited—so please keep your distance. Thanks for your participation!

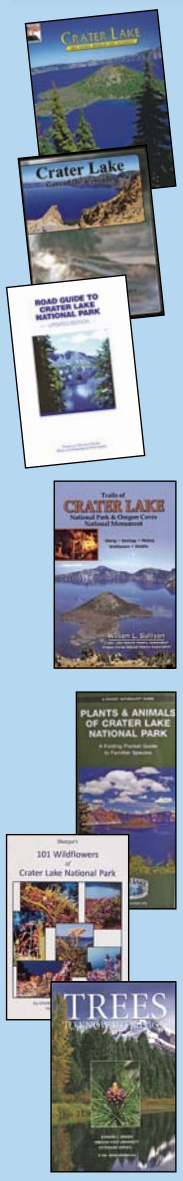
Climate Chart

Summers at Crater Lake are short but warm and sunny. Even so, there are days when the lake is shrouded in clouds. July, August, and September are your best bets for warm, dry weather. In May, June, and October, sunny days alternate with periods of rain and snow. Winters are long and snowy. Storms from the Pacific Ocean dump an average of 43 feet (13 meters) of snow at Park Headquarters. The park's tremendous snowfall is a result of its position at the crest of the Cascade Mountains.

FAHRENHEIT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily High (°F)	34	35	37	42	50	58	69	69	63	52	40	34
Average Daily Low (°F)	18	18	19	23	28	34	41	41	37	31	23	19
Avg. Snowfall (inches)	99	81	83	45	20	4	0.2	0.1	3	21	61	94
Avg. Snow Depth (inches)	79	100	115	110	76	23	1	0	0	2	16	47
Avg. Lake Surface Temp. (°F)	39	38	38	38	40	45	54	59	56	50	45	41

CELSIUS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily High (°C)	1	2	3	6	10	15	21	21	17	11	4	1
Average Daily Low (°C)	-8	-8	-7	-5	-2	1	5	5	3	-1	-5	-7
Avg. Snowfall (cm)	253	207	211	115	50	9	0.5	0.3	6	53	155	239
Avg. Snow Depth (cm)	199	255	291	281	192	60	3	0	0	6	42	120
Avg. Lake Surface Temp. (°C)	4	3	3	3	4	7	12	15	13	10	7	5

Recommended Reading



Crater Lake: The Story Behind the Scenery
Large photos with detailed captions accompany the text of this popular book. 48 pages, $11.95.

Crater Lake: Gem of the Cascades
A comprehensive guide to the park's geologic story, written by a former ranger. 168 pages, $15.95.

Road Guide to Crater Lake National Park
Consult this guide as you circle the lake for a deeper understanding of the park's features. 48 pages, $6.99.

Trails of Crater Lake & Oregon Caves
A detailed guide to 24 hiking trails. 112 pages, $14.95.

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

101 Wildflowers of Crater Lake Nat'l Park
Detailed descriptions and vivid photos of the park's most common flowers. 74 pages, $14.95.

Trees To Know in Oregon
Tree identification is easy and enjoyable with this photo-packed, fact-filled guide. 153 pages, $18.00.

Other Useful Items

Crater Lake: Into the Deep DVD
Own the film shown at the visitor center. Discover the park's significance and explore the lake's violent past. 22 minutes, $14.99.

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 Topo Map
Waterproof and tearproof. 1:55,000 scale. $11.95.

Crater Lake Water Bottle
This plastic bottle's flip-top lid makes it easy to quench your thirst. $3.99.

Star & Planet Guide
Rotating "planisphere" for locating stars, planets, and constellations. $11.99.

Crater Lake Reusable Shopping Bag
Earth-friendly and great for groceries. Made from recycled materials. $3.99.

Moisture-Wicking Cap
Synthetic cap with colorful Crater Lake logo. Will keep your head dry during athletic activity. $19.99.

Clark's Nutcracker T-Shirt
100% cotton. Bird on front, lake on back. $19.99.

EXPERIENCE YOUR AMERICA™

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

Crater Lake National Park
PO Box 7
Crater Lake, OR 97604

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 any Oregon DMV office or www.oregon.gov/odot/dmv for details.

Proceeds go 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.

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. Volunteers are provided free housing in exchange for 3 months or more of service.

To volunteer periodically, join The Friends of Crater Lake, a non-profit organization founded in 1993. Members remove non-native plants, build and maintain trails, assist with special events, and more. For details, visit www.friendsofcraterlake.org. Or join the Crater Lake Ski Patrol, which 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 safety in exchange for at least 6 days of service each winter. To learn more, visit www.craterlakeskipatrol.weebly.com.

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 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. The association funds a variety of important projects, including the printing of this visitor guide. Some of the bookstores' offerings are described to the left. For a complete list of merchandise and to buy items online, visit www.craterlakeoregon.org. You can also order by calling 541-594-3111.

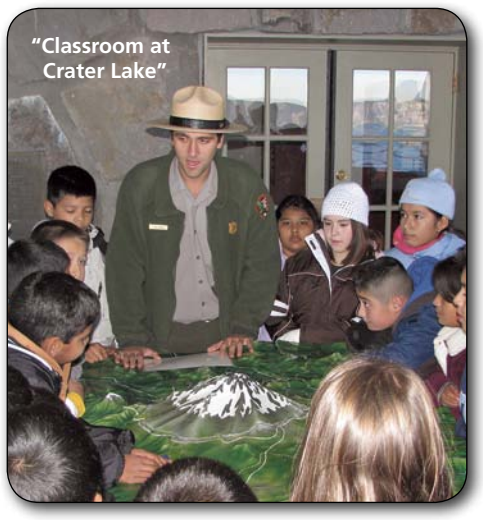
The National Park Service turns 100 on August 25, 2016! Buy at least $50 of NPS centennial merchandise at either visitor center (while supplies last) and receive

$5 OFF

your purchase when you say "Happy Birthday" to the cashier.

Contribute to 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. It helps fund, for example, field trips to the park for more than 5,000 grade-school students each year. In a program called "Classroom at Crater Lake," kids engage in hands-on science and learn about wildlife, old-growth forests, and winter ecology. For most of the kids, it's their first visit to the park. To learn more about the Trust and its activities, visit www.trueblueforever.org. Share your love of the park by making a tax-deductible gift.



"Classroom at Crater Lake"

Share Your Comments

Whether you have a compliment, concern, 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 email to craterlake@nps.gov, or write to: Superintendent, Crater Lake National Park, PO Box 7, Crater Lake, OR 97604.

Thank You!

Welcome!

(continued from page 1)

and the many generations yet to come may create meaningful experiences just as millions of people have done before us. But the Centennial is more than just a celebration of words! We invite you to join us throughout the season for special events and activities. The centerpiece will be a two-day, six-performance premiere, on July 29-30, of an original symphonic piece written specifically for Crater Lake by composer Michael Gordon and sponsored by the Britt Music & Arts Festival.

And while we want you to be caught up in the excitement of the celebration we want to remind you to enjoy the park safely. The incredible beauty, awe, and scale of this place sometimes mask the natural hazards lying within. Stay behind walls and barriers and far back from edges when viewing the lake. Watch for rock fall and other hazards when hiking to the lake or on other park trails. Be alert for other visitors who may be distracted and driving erratically or parked in dangerous places. We want you back to celebrate our 101st birthday!

Craig Ackerman, Superintendent