

Yellowstone National Park inspires awe in travelers from around the world. New Zealand and Iceland are known for geysers, but nowhere are there as many as in Yellowstone. At the heart of Yellowstone's past, present, and future lies volcanism. About 2 million years ago, then 1.3 million years ago, and again 640,000 years ago, huge volcanic eruptions occurred here. The latest spewed out nearly 240 cubic miles of debris. The park's present central portion collapsed, forming a 30- by 45-mile caldera, or basin (see dashed outline on large map). The magmatic heat powering those eruptions still powers the park's geysers, hot springs,

fumaroles, and mudpots. The Grand Canyon of the Yellowstone gives a glimpse of Earth's interior: its waterfalls highlight the boundaries of the lava flows and thermal areas. Rugged mountains flank the park's volcanic plateau, rewarding both eye and spirit. Yellowstone's wildlife includes bison (buffalo), elk, grizzly and black bears, trumpeter swans, and Yellowstone cutthroat trout. Vegetation types range from near-desert vegetation near the North Entrance to subalpine meadows and forests on Mount Washburn. Lodgepole pine covers 60 percent of the park and makes up 80 percent of the forested areas. Yellowstone would

be a premier national park for its scenery or wildlife, but its history abounds in colorful tales, too, of fur trappers—Jim Bridger and Osborne Russell—and explorers, surveyors, photographers, and artists. William Henry Jackson's photographs and Thomas Moran's sketches influenced Congress to establish Yellowstone as the world's first national park in 1872. This national park idea has become a land-use model for many nations, and Yellowstone has evolved from a pleasuring ground and wildlife refuge to today's Biosphere Reserve and World Heritage Site. The guide below helps you choose what to see in your time in Yellowstone. It gives cap-

sule advice on three parts of the Grand Loop's figure-eight-shaped road system that presents the park's major attractions. Facilities and services are shown on the maps and are found in gateway communities, too: Jackson and Cody, Wyo., and West Yellowstone, Gardiner, Silver Gate, and Cooke City, Mont. Ask at a visitor center for other publications to help you see and grasp the park's significance—because its roads sample only a fraction of Yellowstone. The rest of the park is backcountry, traversed by almost 1,000 miles of trails.

Minerva Terrace, Mammoth Hot Springs
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A Guide to the Park and Its Wildlife

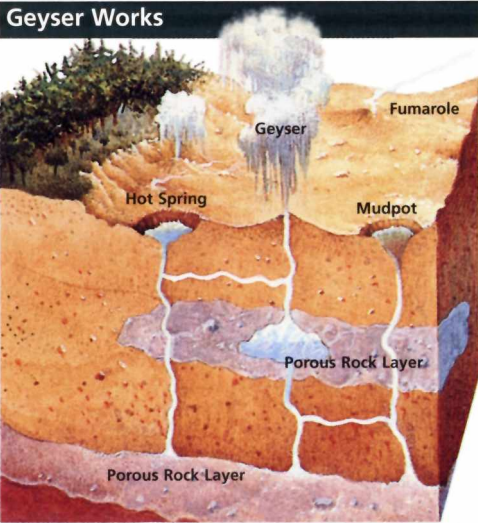


All wildlife, especially bison and bears, can be dangerous; keep your distance! Never approach, harass, or try to feed any animals, even small ones. It is illegal to get within 100 yards of bears or 25 yards of other wildlife or within any distance in which harassment occurs. The best times to see animals in the summer are morning and evening. **Pets** must be leashed and are prohibited on all trails, in thermal basins, and in the backcountry. **Maximum speed limit** is 45 mph, lower when posted. Please drive defensively! Traffic accidents cause more injuries to visitors than natural hazards. Use pull-outs to watch wildlife and to let faster traffic pass. Be alert for pedestrians and bicyclists. Driving off roads is not permitted. Store valuables securely, lock your vehicle, and report thefts or accidents to a ranger. **Defacing of park features**, collecting archeological or natural objects, littering, and picking wildflowers are illegal. Geysers areas and hot springs are fragile and unstable; **stay on trails** to protect yourself and park features. Throwing coins or other items in thermal pools damages them and is illegal. **Climbing** in the Canyon area is prohibited. **Swimming or bathing** in thermal pools or streams whose waters originate from a thermal spring or pool is prohibited. **Permits for fishing and boating** are required and available at ranger stations. Know the regulations before you fish—many streams are catch-and-release or fly-fishing only; some are closed to fishing. Boating is allowed only on lakes; they are dangerously cold. **Camp and build fires** only in designated areas. **Backcountry permits** are required for all overnight trips. Tell your plans to a ranger. It is unsafe to hike alone. Know how to store your food in bear country. Vehicles and bicycles are prohibited on trails. **Emergencies: dial 911 or 307-344-7381.** Bear country! Grizzly and black bears are wild and dangerous. People have been injured seriously and killed by both. Bears seem tolerant of people but may attack without warning. Always view bears from a safe distance. **FEEDING ANY WILDLIFE IS ILLEGAL.** Animals who get handouts often become aggressive and have to be killed. To avoid personal injury store all food in your car, never in your tent. Dispose of garbage in bear-proof garbage cans. Get information at a visitor center about hiking and camping in bear country.



Old Faithful
©TIMOTHY SALZMANN

Old Faithful to Mammoth Hot Springs



Surface water seeps underground, is heated by a deep source of magma, and rises as superheated water. Geysers occur when underground constrictions increase the pressure of the water until it finally erupts. Hot springs have no constrictions, so water rises, cools, and sinks. The small amount of water in fumaroles flashes into steam before reaching the surface. Mudpots are acidic hot springs with limited water. The acid and microorganisms decompose surrounding rock into clay and mud.

A main route to Old Faithful is from the south by way of Jackson, Wyo., and the South Entrance. The park road crosses the Continental Divide three times; waters flow east of it to the Atlantic Ocean or west to the Pacific. This route passes five geyser basins—West Thumb, Upper (Old Faithful), Midway, Lower, and Norris—on the way to Mammoth Hot Springs. Sampling the world's largest concentration of geysers, you follow the Firehole and Gibbon rivers. A visitor center at Old Faithful and museums at Norris tell aspects of the park's stories.

Old Faithful Old Faithful Geyser is the world's best known geyser. Its eruption intervals have varied from 40 to 126 minutes. Find out the eruption times of Old Faithful and other large geysers at the visitor center.

Old Faithful to Madison In Black Sand Basin bright colors of Sunset Lake and Emerald Pool attract photographers. At Biscuit Basin mineral deposits took biscuit shapes, but an earthquake in 1959 triggered changes destroying the biscuits. At Midway Geyser Basin you may walk to Excelsior Geyser Crater and Grand Prismatic Spring. Firehole Lake Drive (one-way, northbound) loops off the main road to Great Fountain Geyser, Firehole Lake, and a variety of hot pools. Lower Geyser Basin features Fountain Paint Pot. Firehole Canyon Drive (one-way loop, southbound), starting south of Madison Junction, passes Firehole Falls. Roadside forests are mainly lodgepole pine. Some areas were burned by wildfire in 1988. South of Madison Junction or along the West Entrance road you can see thousands of small trees that have naturally regenerated since then. West Yellowstone, Mont., lies 14 miles west of Madison Junction. From Madison to Norris you drive along the Yellowstone caldera's northwest rim. Gibbon Falls cascade over the caldera wall.

Norris Junction to Mammoth Hot Springs Norris Geyser Basin's array of thermal features is unparalleled. Steamboat Geyser, the world's tallest, erupts at irregular intervals of days to years. Porcelain Basin is the park's hottest exposed area. Exhibits at Norris Museum explain how geysers work.

At Norris Junction you can turn east toward the Canyon area. At Canyon you can go north to Tower or south to Lake (see tours at right). Continuing north of Norris you pass Obsidian Cliff, a national historic landmark. Obsidian, a volcanic glass used for projectile points and cutting tools, was traded across North America by American Indians. (Collecting obsidian or other rocks is prohibited.) Two miles south of Mammoth Hot Springs the Upper Terrace Drive passes through a thermal area. Gnarled limber pines on some dormant formations are more than 500 years old. At Mammoth Hot Springs the travertine (calcium carbonate) forms spectacular terraces. Exhibits at the Albright Visitor Center portray the park's history and wildlife and how the U.S. Army protected the park from 1886 to 1916. Park headquarters is in the buildings of Fort Yellowstone, a 19th-century cavalry post. Gardiner, Mont., is five miles north. The Yellowstone River flows north to the Missouri River.



Lower Falls, Grand Canyon of the Yellowstone
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To Tower-Roosevelt and Canyon Village

The road east from Mammoth Hot Springs leads you four miles to Undine Falls, then 0.2 miles to Lava Creek (picnic area). Three miles farther east look for waterfowl and muskrats at Blacktail Ponds. Blacktail Plateau Drive, a one-way dirt road eastbound, leaves the main road to traverse the grass and sagebrush-covered hills and forests of Douglas fir, Engelmann spruce, and lodgepole pine. Watch for pronghorns, mule deer, and elk. In autumn the groves of quaking aspen trees turn gold. The next side road leads to a petrified redwood tree. Such trees, some upright, are found over hundreds of square miles in northern Yellowstone.

Tower-Roosevelt to Northeast Entrance Lamar Valley, accessible all year, is winter range for elk and bison. This is a good area to look for predators (wolves, bears, foxes, and coyotes) and their prey. During the park's main season you may camp at Slough Creek or Pebble Creek campgrounds en route to the Northeast Entrance, 29 miles from Tower-Roosevelt. Just beyond the entrance are Silver Gate (one mile) and Cooke City (four miles), Mont. Beartooth Highway (U.S. 212) climbs to more than 10,900 feet at Beartooth Pass.

Tower-Roosevelt to Canyon Village Tower Fall, tumbling 132 feet, was named for the adjacent volcanic pinnacles. Tower Creek flows into the Yellowstone River. South from Tower Fall, as you drive up Mount Washburn, look east, downslope, into prime grizzly bear country on Antelope Creek. To provide bears refuge this area is closed to human travel. **DO NOT TRY TO FEED OR APPROACH BEARS.** The main road next crosses Dunraven Pass (8,859 feet elevation) amidst broad-topped whitebark pines and spire-shaped subalpine fir. Meadows display wildflowers in the brief summer. From Washburn Hot Springs Overlook south of the pass you can see the Yellowstone caldera. Its north boundary is Mount Washburn; the south boundary is the Red Mountains. On clear days you can see the Teton Range beyond the Red Mountains.

Canyon Village North Rim Drive, a 2.5-mile one-way road, leads to views, including Inspiration Point on a spur road. The Grand Canyon of the Yellowstone plunges 1,000 feet. Hot water acting on volcanic rock created the canyon's colors. The canyon was downcut rapidly more than once, perhaps by glacial outburst floods, but there is little deepening today. Grand View gives spectacular views of the canyon. Lookout Point affords a vista of Lower Falls, and a steep trail descends to a closer viewpoint. Back on the main road, turn left



Since the late 1800s Yellowstone has been a travelers' mecca. The world's first national park proved a popular success. These visitors hiked into the Grand Canyon of the Yellowstone, where Uncle Tom Richardson served a picnic lunch.

in 0.3 mile to view the brink of the 109-foot Upper Falls. On the main road across, go 0.6 mile south to South Rim Drive and cross the Chittenden Bridge to Uncle Tom's Parking Area. The trails here offer close views of the Upper and Lower Falls. South Rim Drive leads to Artist Point for another classic view of the canyon and Lower Falls.

Hayden Valley The road follows the Yellowstone River's meanderings across a former lakebed. Soil here permits little tree growth, and the shrub-and-grassland valley plants are used by grazing animals—from rodents to large ungulates such as elk, moose, and bison—that in turn attract associated species, from carcase beetles and butterflies to bears and coyotes. Waterfowl, including white pelicans, are abundant in marshy areas. In this open parkland you may see moose, bison, and occasionally even grizzly bears. **VIEW LARGE ANIMALS ONLY AT A DISTANCE, FROM YOUR CAR OR FROM ROADSIDES.** Do not stop in roadways; use roadside parking areas for your safety. No fishing is allowed for a six-mile section in Hayden Valley, to provide quiet for animals and scenic views of untrammeled wilderness for you. Stop at Mud Volcano and see the varied thermal features there. In June and July you may see spawning cutthroat trout jump at LeHardys Rapids, three miles north of Fishing Bridge.



Yellowstone Lake
©TIMOTHY SALZMANN

The Lake Area

East Entrance to Fishing Bridge Junction Cody, Wyo., lies 50 miles beyond the East Entrance. As you cross 8,530-foot-elevation Sylvan Pass watch for pikas and yellow-bellied marmots (see illustration above) in the rocky debris of talus slopes. You descend the west slope of the Absaroka Range, eroded volcanic mountains named for the Crow tribe. Near Yellowstone Lake a spur road leads to Lake Butte Overlook for a view of this huge body of water. Yellowstone Lake occupies only the southeast quarter of the Yellowstone caldera (see top text). At the overlook you are just outside its east boundary. Just north of the lake the land surface rises and subsides. This suggests that the Yellowstone caldera is not dormant and will likely erupt again. As you drive along the lake's edge, you can see Steamboat Springs, a hot spring remnant on a line of faults or fractures in the Earth that also passes through Mary Bay and Indian Pond to the northwest. Bay and pond both occupy geologically recent hydrothermal explosion craters. New surveys have revealed hydrothermal vents, tall spires composed of silica and diatoms, and steep-walled depressions that may be hydrothermal explosion craters. Bottom sediments in Mary Bay are still very warm. Approaching Fishing Bridge, watch for birds—herons, eagles, ospreys, and ducks—in the riparian zone along Pelican Creek flats.

Exhibits at Fishing Bridge Visitor Center feature birds. Fishing Bridge itself spans the Yellowstone River, the lake's outlet. The bridge, closed to fishing in 1973, now offers one of the best wild trout spawning shows anywhere for most of the summer. White pelicans feed on native cutthroat trout. A park for hard-sided camping vehicles is at Fishing Bridge.

Yellowstone Lake is North America's largest mountain lake. Over geological time it has drained into the Pacific Ocean and into the Arctic Ocean via Hudson Bay. It now drains into the Atlantic via the Gulf of Mexico. The lake is 20 miles long, 14 miles wide, and 430 feet deep at its deepest point. It averages 140 feet deep. Native trout generally inhabit the upper 60 feet because their foods rarely occur below that depth. Average August surface temperature is 60°F. Bottom temperature never rises above 42°F. Swimming is discouraged even where not prohibited; such cold waters can cause potentially fatal hypothermia or hyperventilation within mere minutes.



Eleven native fish species include three races of cutthroat trout (top)—named for the red on their lower jaws—and mountain whitefish (bottom).

Boating is permitted on some lakes. Get permits—required for all watercraft—and advice on canoeing and kayaking at ranger stations at Bridge Bay or Grant Village. A marina is at Bridge Bay, and a boat ramp is at Grant Village.

Traveling toward West Thumb you may walk or bicycle a rough spur road, starting south of Bridge Bay, to see the area's namesake natural bridge. Gull Point Drive loops off the Grand Loop Road for even closer views of the lake's edge.

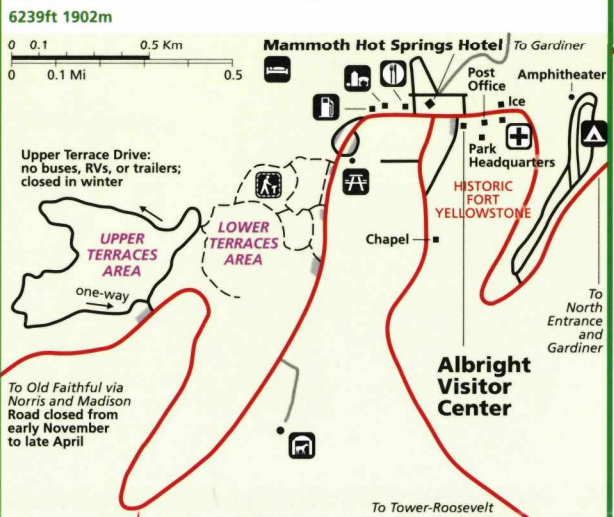
West Thumb and Grant Village Walk the boardwalk through the geyser basin at lake's edge at West Thumb. Intense heat measured in lake sediments below West Thumb indicates a shallow thermal system underlying this more recent caldera within the Yellowstone caldera. Should the lake level fall just a few feet, an immense steam (hydrothermal) explosion could occur here. That is what created the craters now filled by Mary Bay and Indian Pond (described above). Exhibits at Grant Village Visitor Center, two miles south of West Thumb, highlight the role of fire in Yellowstone. Fishing, boating, and backcountry use permits are available at ranger stations; ask for details or check our website.

Exploring Yellowstone

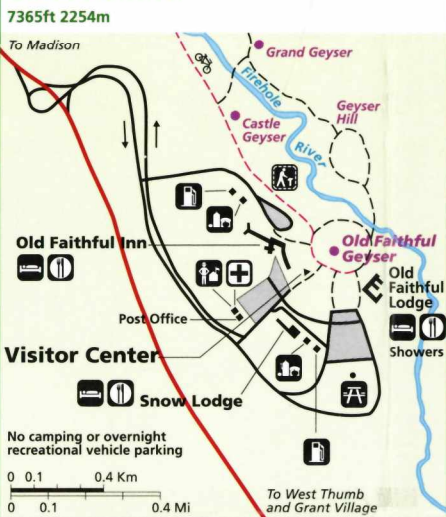
Services and Facilities

- Emergencies**
For medical or other emergencies contact a ranger or call 307-344-7381 or 911.
- Check the park newspaper for seasonal dates of services and facilities.**
- Medical clinic
 - Ranger station
 - Campground
 - Lodging
 - Food service
 - Picnic area
 - Store
 - Gas station (some have auto repair)
 - Self-guiding trail
 - Horse rental
 - Boat launch
- Winter road closures**
From early November to early May most park roads are closed. The exception is the road in the park between the North Entrance and Cooke City. It is open all year.
- From mid-December to early March, oversnow vehicles may be used only on the unplowed, groomed park roads. Call park headquarters for regulations or check the park website, www.nps.gov/yell.

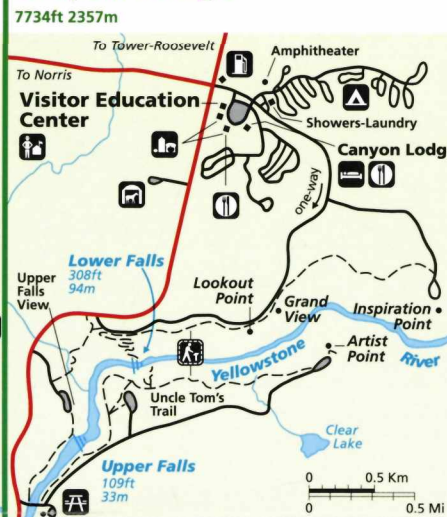
Mammoth Hot Springs



Old Faithful



Canyon Village



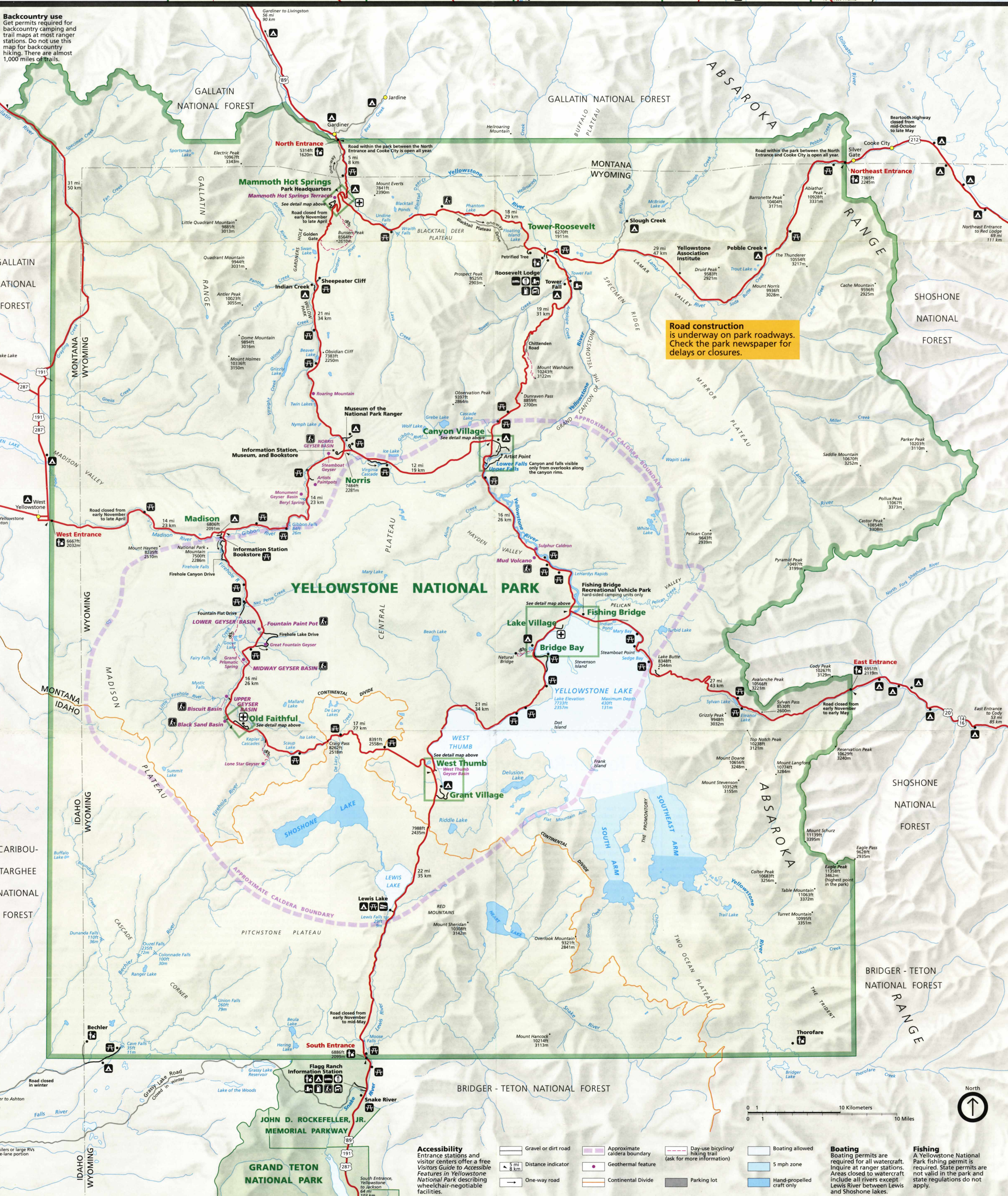
West Thumb and Grant Village



Fishing Bridge, Lake Village and Bridge Bay



Backcountry use
Get permits required for backcountry camping and trail maps at most ranger stations. Do not use this map for backcountry hiking. There are almost 1,000 miles of trails.



Road construction is underway on park roadways. Check the park newspaper for delays or closures.

Accessibility
Entrance stations and visitor centers offer a free Visitors Guide to Accessible Features in Yellowstone National Park describing wheelchair-negotiable facilities.

- Gravel or dirt road
- Distance indicator
- One-way road
- Approximate caldera boundary
- Geothermal feature
- Continental Divide

- Day-use bicycling/hiking trail (ask for more information)
- Parking lot

- Boating allowed
- 5 mph zone
- Hand-propelled craft only

Boating
Boating permits are required for all watercraft. Inquire at ranger stations. Areas closed to watercraft include all rivers except Lewis River between Lewis and Shoshone lakes.

Fishing
A Yellowstone National Park fishing permit is required. State permits are not valid in the park and state regulations do not apply.