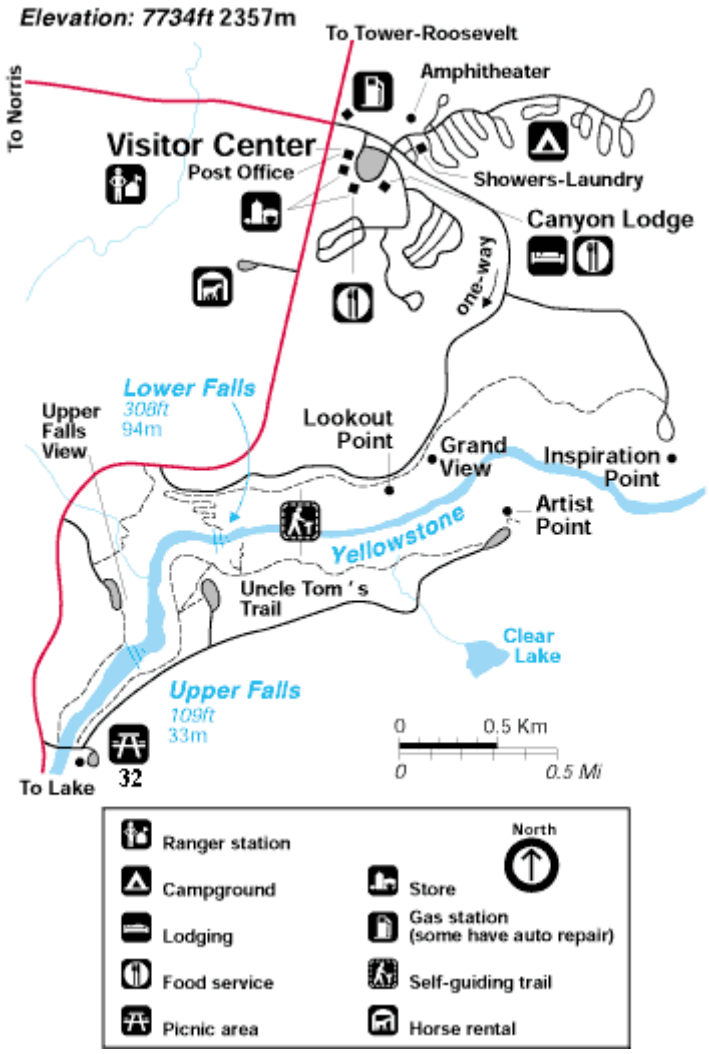
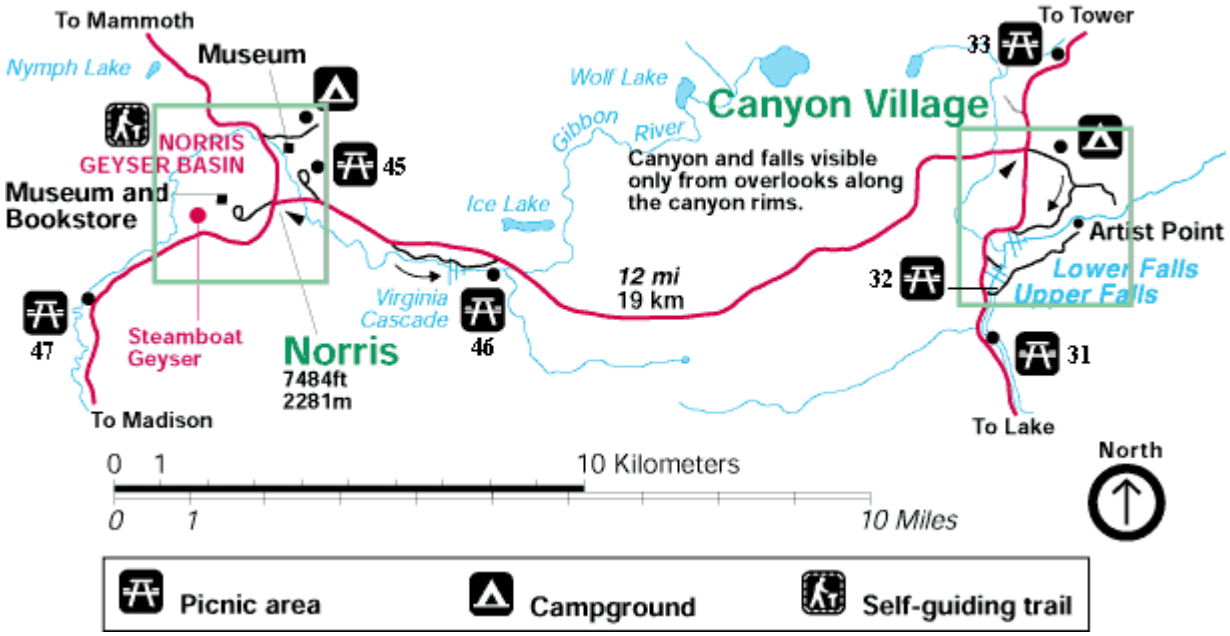
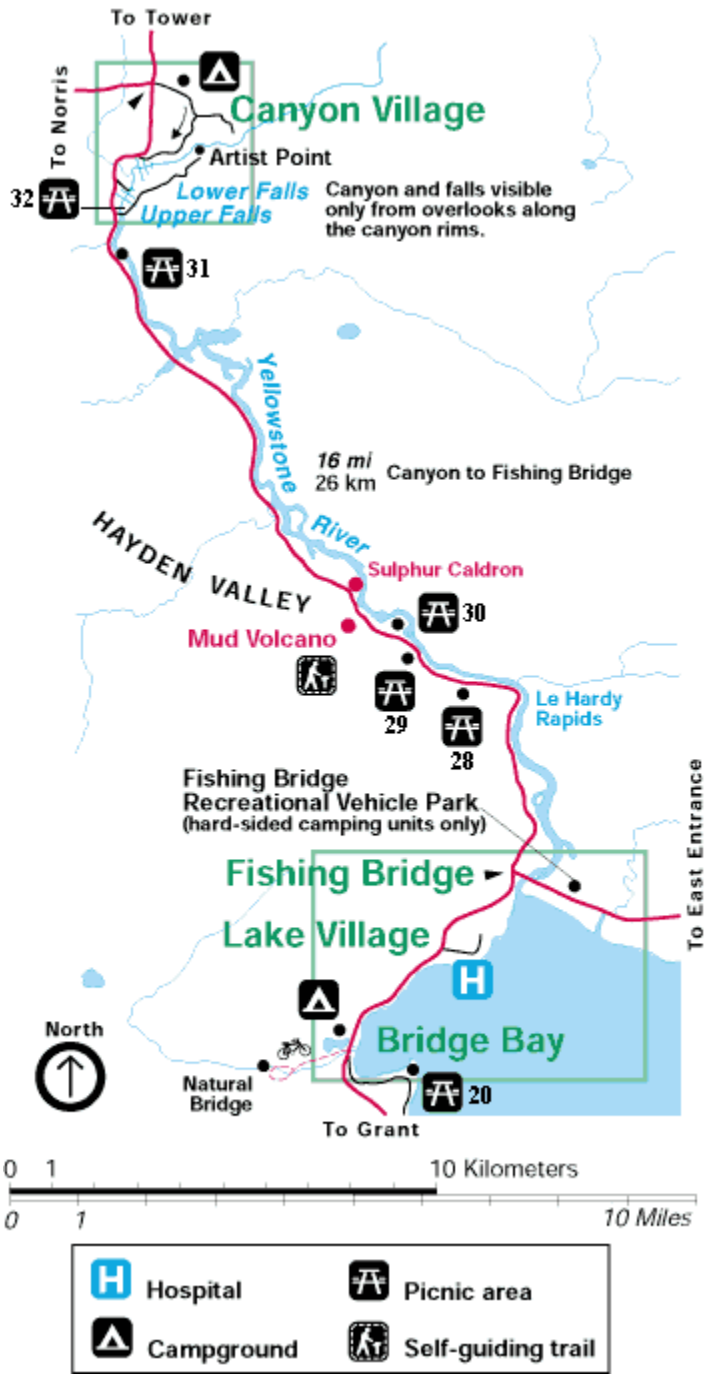
CANYON AREA MAP



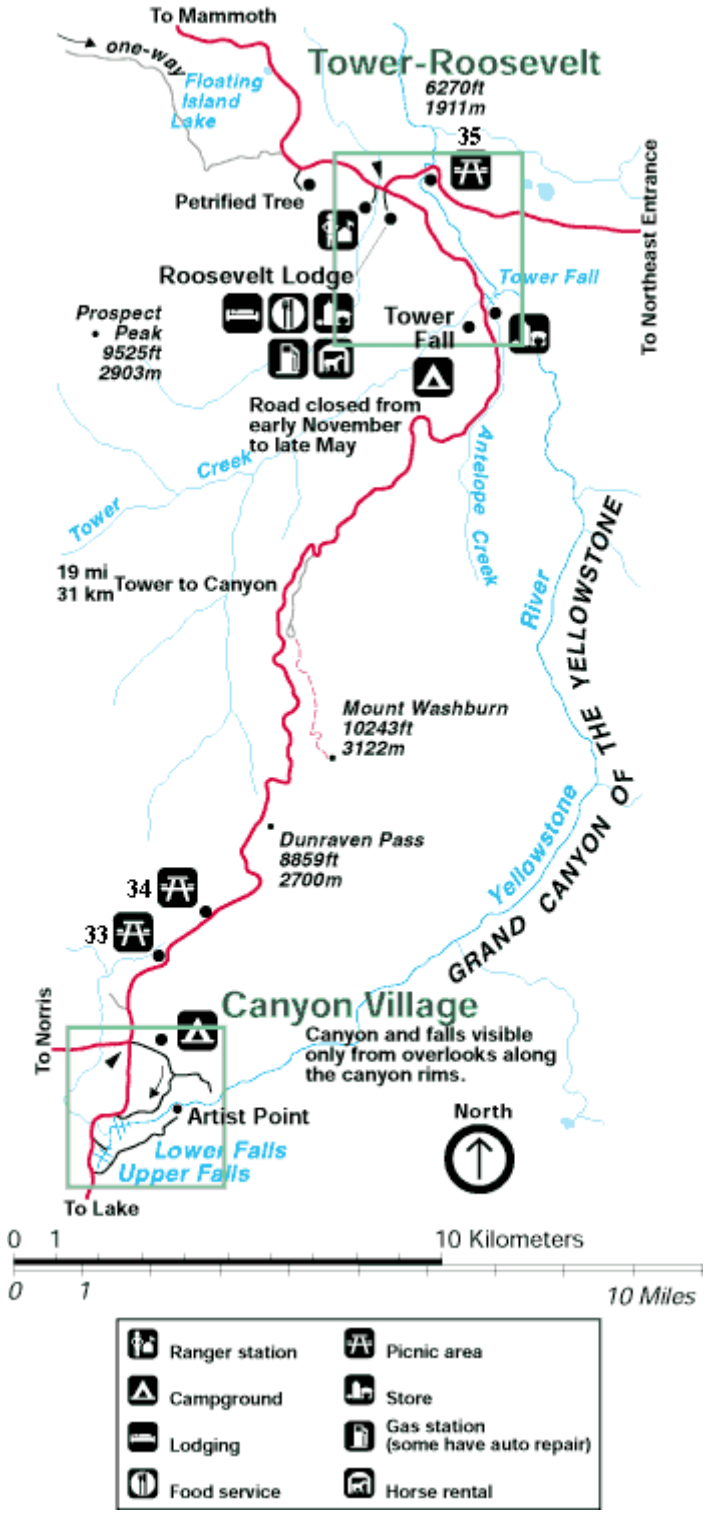
Canyon to Norris Road Map



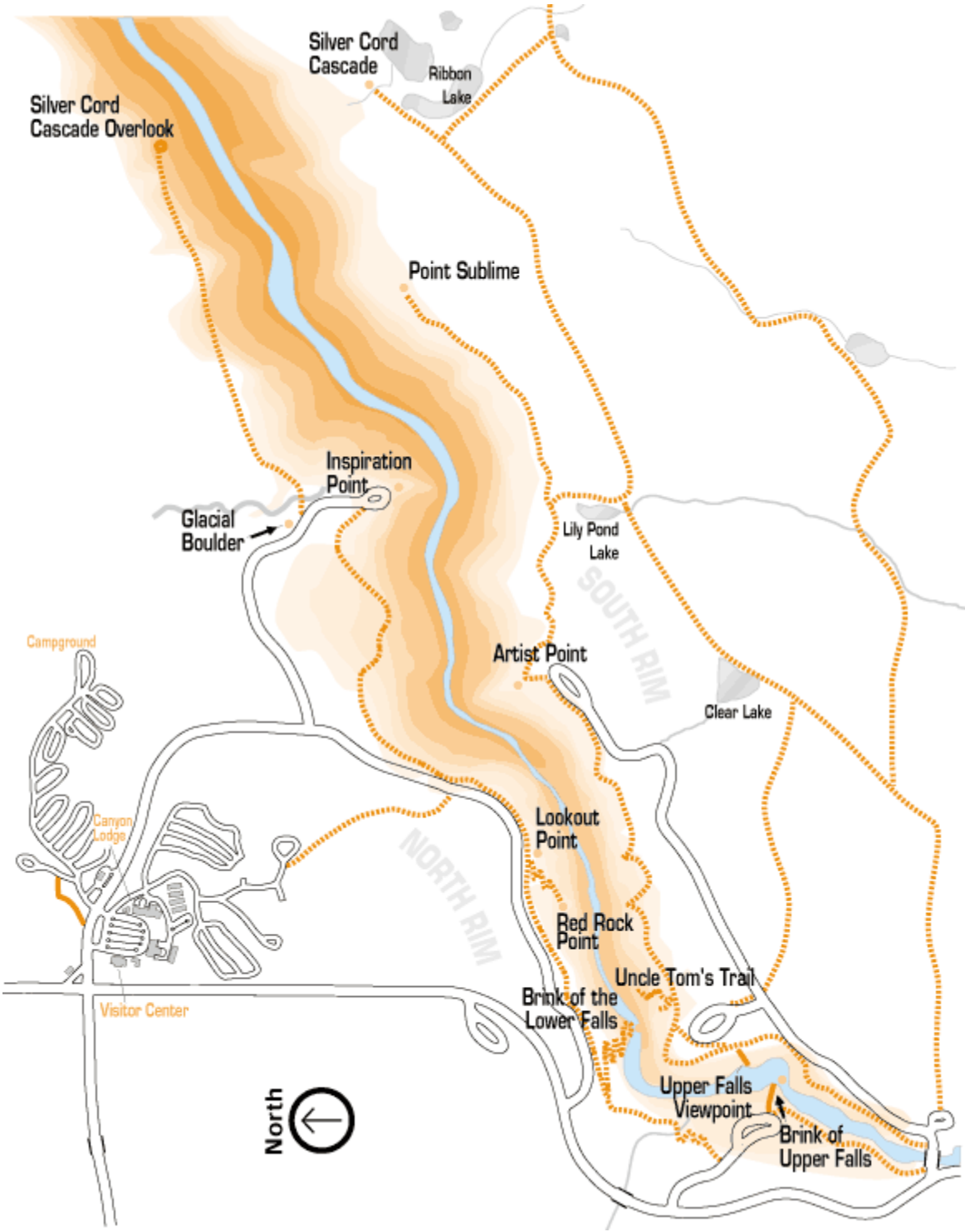
Lake Vicinity to Canyon Village Road Map



Canyon to Tower-Roosevelt Road Map



Grand Canyon Tour map



The Grand Canyon of the Yellowstone Tour

Introduction

About 600,000 years ago, huge volcanic eruptions occurred in Yellowstone, emptying a large underground magma chamber. Volcanic debris spread for thousands of square miles in a matter of minutes. The roof of this chamber collapsed, forming a giant smoldering pit. This caldera was 30 miles (45 km) across, 45 miles (75 km) long, and several thousand feet deep. Eventually the caldera was filled with lava.

One of these lava flows was the Canyon Rhyolite flow, approximately 590,000 years ago which came from the east and ended just west of the present canyon. A thermal basin developed in this lava flow, altering and weakening the rhyolite lava by action of the hot steam and gases. Steam rises from vents in the canyon today and the multi-hued rocks of the canyon walls are also evidence of hydrothermally altered rhyolite.

Other lava flows blocked rivers and streams forming lakes that overflowed and cut through the various hard and soft rhyolites, creating the canyon. Later the canyon was blocked three different times by glaciers. Each time these glaciers formed lakes, which filled with sand and gravel. Floods from the melting glaciers at the end of each glacial period recarved the canyon, deepened it, and removed most of the sand and gravel.

The present appearance of the canyon dates from about 10,000 years ago when the last glaciers melted. Since that time, erosional forces (water, wind, earthquakes, and other natural forces) have continued to sculpt the canyon.

North Rim

GLACIAL BOULDER

Along the road to Inspiration Point there is a house-sized granite boulder sitting in the pine forest alongside the road. It was plucked from the Beartooth Mountains by an early Pinedale Glacier and dropped on the north rim of the Grand Canyon of the Yellowstone nearly 80,000 years ago. Continued glacial advances and retreats led to the present-day appearance of the canyon and surrounding area.

INSPIRATION POINT

Inspiration Point is a natural observation point. It is at a location where the canyon wall juts far out into the canyon allowing spectacular views both upstream and down.

View Down Canyon (Left)

View Up Canyon (Right)

The point of land from which this photo was taken juts so far out into the canyon that it was called Promontory Point in 1878. It wasn't until sometime around 1884 that the brilliant colors of the canyon in this area led to the promontory being renamed Inspiration Point.

A member of the Washburn party in 1870, Nathanial P. Langford, used these words to describe his visit to this point:

"The place where I obtained the best and most terrible view of the canyon was a narrow projecting point situated two to three miles below the lower fall. Standing there or rather lying there for greater safety, I thought how utterly impossible it would be to describe to another the sensations inspired by such a presence. As I took in the scene, I realized my own littleness, my helplessness, my dread exposure to destruction, my inability to cope with or even comprehend the mighty architecture of nature."

SILVER CORD CASCADE OVERLOOK

This photo was taken along the trail leading to the Silver Cord Cascade Overlook on the north rim. The Silver Cord Cascade is on the opposite side of the canyon where Surface Creek flows over the canyon lip and falls in a series of cascades down to the Yellowstone River.

LOOKOUT POINT

This was a popular lookout for many early visitors to the park. Noticing that it got regular visitation, in 1880 Superintendent P.W. Norris built a railing here and the location has been called Lookout Point ever since. It is likely that this was the superintendents preferred name for the spot. It had been called many things prior to 1880 including Point Lookout, Lookout Rock, Mount Lookout, and Prospect Point.

RED ROCK POINT

Red Rock Point is near the tall reddish pinnacle of rock below the Lower Falls. Iron oxide is the cause of this rock's red pigmentation. The pinnacle has had several names relating to its color including Red Pinnacles and Cinnabar Tower. It was finally given its present-day name of Red Rock by the 1886 Park Photographer, F. Jay Haynes.

The boardwalk to Red Rock Point is visible in the foreground of this photo.

BRINK OF THE LOWER FALLS

The Lower Falls is the tallest waterfall in the park at 308 feet. The arrow at the top of the photo points at a group of visitors on the platform at the Brink of the Lower Falls.

Over the years the estimates of the height of this falls has varied dramatically. In 1851 Jim Bridger estimated its height at 250 feet. One outrageous newspaper story from 1867 placed its height at "thousands of feet". A map from 1869 gives the falls its current name of Lower Falls for the first time and estimates the height at 350 feet.

It mattered little how tall the observers thought the falls was. They consistently write journal entries that comment on its awe-inspiring nature. A member of the 1870 Washburn party N. P. Langford gave this brief but poetic description: "A grander scene than the lower cataract of the Yellowstone was never witnessed by mortal eyes."

BRINK OF THE UPPER FALLS

This is the smaller of the two famous waterfalls on the Yellowstone River at 109 feet tall. To get a feel for its magnitude notice that the arrow at the top of the photo points at three people standing on the platform at the Brink of the Upper Falls.

This falls was called the "upper falls" for the first time by members of the 1869 Folsom party who estimated its height at 115 feet.

Visitors to the Brink of the Upper Falls have throughout time found the power of the experience worthy of detailed description. In 1870 N.P. Langford of the Washburn party wrote of his visit to the brink:

"Mr. Hedges and I made our way down to this table rock, where we sat for a long time. As from this spot we looked up at the descending waters, we insensibly felt that the slightest protrusion in them would hurl us backwards into the gulf below. A thousand arrows of foam, apparently aimed at us, leaped from the verge, and passed rapidly down the sheet. But as the view grew upon us, and we comprehended the power, majesty and beauty of the scene, we became insensible to the danger and gave ourselves up to the full enjoyment of it."

South Rim

UPPER FALLS VIEWPOINT

Of the two famous Yellowstone River waterfalls this one stands at a higher elevation, but it is considerably shorter in height than its downstream neighbor, the Lower Falls. The height of the Upper Falls is 109 feet.

According to a companion, the famous mountain man Jim Bridger visited this waterfall in 1846. Word spread of its existence and in the 1860s some prospectors went out of their way to visit it.

UNCLE TOM'S TRAIL

Uncle Tom's Trail was first constructed in 1898 by "Uncle" Tom Richardson. The five years following its construction, Uncle Tom led visitors on tours which included crossing the river upstream from the present day Chittenden Bridge, and then following his rough trail to the base of the Lower Falls. The tour was concluded with a picnic and a return trip across the river.

Today Uncle Tom's Trail is very different from the simple trail used by Mr. Richardson and his visitors. It is still, however, a very strenuous walk into the canyon. The trail drops 500 feet (150 m) in a series of more than 300 stairs and paved inclines.

ARTIST POINT

Many people thought that this was the point where Thomas Moran made the sketches he used to produce his famous painting of the canyon in 1872. In fact those sketches were made from the north rim in a location known today as Moran Point.

The name Artist Point is believed to have been given to this location around 1883 by Park Photographer F. Jay Haynes. The name appeared in print for the first time in Mr. Haynes guidebook, published in 1890.

POINT SUBLIME

When the Cook-Folsom expedition stepped out of the woods on the south rim of the canyon in 1869 the staggering view prompted Folsom to use the following adjectives in his description of it: "pretty, beautiful, picturesque, magnificent, grand, sublime, awful, terrible". It is thought to be that description which prompted the naming of Point Sublime in the early 1920s.

SILVER CORD CASCADE

Surface Creek flows past this overlook and then falls abruptly in a long series of falls down to the river. While not a single waterfall, this cascade may well have given rise to the stories of a waterfall over 1000 feet tall that was hidden in the mountains.

Members of the Washburn party discovered the cascade in 1870 and named it Silverthread Fall. In 1885 the USGS Hague parties gave it the name that survives today, Silver Cord Cascade.

TOUR CONCLUSION

A View from Artist Point

Thank you for joining us on this tour of the Grand Canyon of the Yellowstone. To learn more about the canyon, visit our Inside Yellowstone videos page.

Day Hikes Near Canyon Village

Begin your hike by stopping at a ranger station or visitor center for information. Trail conditions may change suddenly and unexpectedly. Bear activity, rain or snow storms, high water, and fires may temporarily close trails.

Canyon Rims

There are numerous trails and viewpoints of the canyon falls, both from the north and south rim.

Mary Mountain Trail

This trail climbs gradually up over Mary Mountain and the park's Central Plateau to the Nez Perce trailhead between Madison and Old Faithful.. Elk and bison can sometimes

be seen in the distant meadows. The trail through Hayden Valley is often difficult to follow as bison regularly knock down the trail markers.

Trailhead: North of Alum Creek pullout, 4 miles south of Canyon Junction
Distance: 21 miles one way
Level of Difficulty: Moderately strenuous due to length

Howard Eaton Trail

This hike, with little vertical rise, will take 2-8 hours. It passes through forest, meadow, and marshland to Cascade Lake (3 mi; 4.8 km), Grebe Lake (4.25 mi; 6.8 km), Wolf Lake (6.25 mi; 10 km), Ice Lake (8.25 mi; 13.7 km), and Norris Campground (12 mi; 19.3 km). Most years, this trail remains very wet and muddy through July. Insects can be very annoying.

Trailhead: 0.5 miles (0.8 km) west of Canyon Junction on the Norris-Canyon Road
Distance: From 3-12 miles one way, depending on destination
Level of Difficulty: Moderately easy

Cascade Lake Trail

This hike takes 3 hours and is an enjoyable walk through open meadows and over small creeks for those with limited time. Look for wildlife and wildflowers in season. Most years, this trail remains very wet and muddy through July.

Trailhead: Cascade Lake Picnic Area, 1.5 miles north of Canyon Jct. on the Tower-Canyon Road.
Distance: 4.5 miles (7.2 km) roundtrip
Level of Difficulty: Easy

Observation Peak

Hike to Cascade Lake from either of its two trailheads. From the lake, this strenuous, 1,400 foot climb in 3 miles will take roughly 3 hours. The hike takes you to a high mountain peak for an outstanding view of the Yellowstone wilderness. The trail passes through open meadows and some whitebark pine forests. Past Cascade Lake, no water is available along the trail. **Not recommended for persons with heart and/or respiratory problems.**

Trailhead: Cascade Lake Picnic Area, 1.5 miles north of Canyon Jct. on the Tower- Canyon Road. The other trailhead is accessed from a pullout 1/4 mile west of Canyon on the Norris-Canyon Road.
Distance: 11 miles roundtrip
Level of Difficulty: Strenuous

Grebe Lake Trail

There is little vertical rise on this 3-4 hour hike. This trail follows an old fire road through meadows and forest, some of which burned during the fires of 1988. Once at the lake you can connect with the Howard Eaton Trail.

Trailhead: 3.5 miles (5.6 km) west of Canyon Junction on the Norris-Canyon Road
Distance: 6 miles (9.7 km) roundtrip
Level of Difficulty: Moderately easy

Seven Mile Hole Trail

This hike takes 6-8 hours to complete. Following the Canyon Rim for the first 1.5 miles (2.4 km), you will be rewarded with views of Silver Cord Cascade. Continue north another 0.5 mile (0.8 km) to join the Washburn Spur Trail; at 3 miles (4.8 km), the trail drops off to Seven Mile Hole, a 1.5 mile (2.4 km), 1,400 foot (425 m) drop. Hike it carefully, watch your footing, and conserve your energy. Depending on your condition and the weather, it can be a long hike back out. Be especially careful where the trail passes both dormant and active hot springs. Off-trail travel is prohibited. **Not recommended for persons with heart and/or respiratory problems.**

Trailhead: Glacial Boulder Trailhead on Inspiration Point Road
Distance: 11 miles (17.7 km) roundtrip
Level of Difficulty: Strenuous

Washburn Trail/Washburn Spur Trail

This hike begins at the Dunraven Pass trailhead to Mount Washburn and ends at the Glacial Boulder on Inspiration Point Road. This strenuous hike takes 6-8 hours to complete. Starting at the Washburn Trailhead at Dunraven Pass, you ascend Mt. Washburn on a trail complete with (in season) wildflowers, bighorn sheep, and spectacular views. After this three mile ascent, the Washburn Spur Trail descends very steeply from the east side of the Fire Lookout to Washburn Hot Springs in another 3.7 miles (6 km). Here you will find some interesting thermal features, including mud pots. Continue past the turnoff to Seven Mile Hole and follow the trail to the Glacial Boulder and the Canyon area. **Not recommended for persons with heart and/or respiratory problems.**
Trailhead: Dunraven Pass, Washburn Trailhead, 4.5 miles north of Canyon Junction
Distance: 11.5 miles (18.5 km) one way
Level of Difficulty: Strenuous

Canyon Area Natural Highlights

The Grand Canyon of the Yellowstone

The Grand Canyon of the Yellowstone is the primary geologic feature in the Canyon District. It is roughly 20 miles long, measured from the Upper Falls to the Tower Fall area. Depth is 800 to 1,200 ft.; width is 1,500 to 4,000 ft. The canyon as we know it today is a very recent geologic feature. The present canyon is no more than 10,000 to 14,000 years old, although there has probably been a canyon in this location for a much longer period. The exact sequence of events in the formation of the canyon is not well understood, as there has been little field work done in the area. The few studies that are available are thought to be inaccurate. We do know that the canyon was formed by erosion rather than by glaciation. A more complete explanation can be found in the Geological Overview section. The geologic story of the canyon, its historical significance as a barrier to travel, its significance as destination/attraction, and its appearance in Native American lore and in the accounts of early explorers are all important interpretive points. The "ooh-ahh" factor is also important: its beauty and grandeur, its significance as a feature to be preserved, and the development of the national park idea.

The Upper and Lower Falls of the Yellowstone

The falls are erosional features formed by the Yellowstone River as it flows over progressively softer, less resistant rock. The Upper Falls is upstream of the Lower Falls and is 109 ft. high. It can be seen from the Brink of the Upper Falls Trail and from Uncle Tom's Trail.

The Lower Falls is 308 ft. high and can be seen from Lookout Point, Red Rock Point, Artist Point, Brink of the Lower Falls Trail, and from various points on the South Rim Trail. The Lower Falls is often described as being more than twice the size of Niagara, although this only refers to its height and not the volume of water flowing over it. The volume of water flowing over the falls can vary from 63,500 gal/sec at peak runoff to 5,000 gal/sec in the fall.

A third falls can be found in the canyon between the Upper and Lower falls. Crystal Falls is the outfall of Cascade Creek into the canyon. It can be seen from the South Rim Trail just east of the Uncle Tom's area.

The Yellowstone River

The Yellowstone River is the force that created the canyon and the falls. It begins on the slopes of Yount Peak, south of the park, and travels more than 600 miles to its terminus in North Dakota where it empties into the Missouri River. It is the longest undammed river in the continental United States.

Hayden Valley

Hayden Valley is one of the best places in the park to view a wide variety of wildlife. It is an excellent place to look for grizzly bears, particularly in the spring and early summer when they may be preying upon newborn bison and elk calves. Large herds of bison may be viewed in the spring, early summer, and during the fall rut, which usually begins late July to early August. Coyotes can almost always be seen in the valley.

Bird life is abundant in and along the river. A variety of shore birds may be seen in the mud flats at Alum Creek. A pair of sandhill cranes usually nests at the south end of the valley. Ducks, geese, and American white pelicans cruise the river. The valley is also an excellent place to look for bald eagles and northern harriers.

Mt. Washburn

Mt. Washburn is the main peak in the Washburn Range, rising 10,243 ft. above the west side of the canyon. It is the remnant of volcanic activity that took place long before the formation of the present canyon. It is an excellent example of subalpine habitat and is very accessible to the average visitor. Bighorn sheep and an abundance of wildflowers can be found on its slopes in the summer. Mt. Washburn was named for Gen. Henry Dana Washburn, leader of the 1870 Washburn-Langford-Doane Expedition.

Canyon Area Geologic Highlights

The Grand Canyon of the Yellowstone

The specifics of the geology of the canyon are not well understood, except that it is an erosional feature rather than the result of glaciation. After the caldera eruption of about 600,000 years ago, the area was covered by a series of lava flows. The area was also faulted by the doming action of the caldera before the eruption. The site of the present canyon, as well as any previous canyons, was probably the result of this faulting, which allowed erosion to proceed at an accelerated rate. The area was also covered by the glaciers that followed the volcanic activity. Glacial deposits probably filled the canyon at one time, but have since been eroded away, leaving little or no evidence of their presence.

The canyon below the Lower Falls was at one time the site of a geyser basin that was the result of rhyolite lava flows, extensive faulting, and heat beneath the surface (related to the hot spot). No one is sure exactly when the geyser basin was formed in the area, although it was probably present at the time of the last glaciation. The chemical and heat action of the geyser basin caused the rhyolite rock to become hydrothermally altered, making it very soft and brittle and more easily erodible (sometimes likened to baking a potato). Evidence of this thermal activity still exists in the canyon in the form of geysers and hot springs that are still active and visible. The Clear Lake area (Clear Lake is fed by hot springs) south of the canyon is probably also a remnant of this activity.

According to Ken Pierce, U.S. Geological Survey geologist, at the end of the last glacial period, about 14,000 to 18,000 years ago, ice dams formed at the mouth of Yellowstone Lake. When the ice dams melted, a great volume of water was released downstream causing massive flash floods and immediate and catastrophic erosion of the present-day canyon. These flash floods probably happened more than once. The canyon is a classic V-shaped valley, indicative of river-type erosion rather than glaciation. The canyon is still being eroded by the Yellowstone River.

The colors in the canyon are also a result of hydrothermal alteration. The rhyolite in the canyon contains a variety of different iron compounds. When the old geyser basin was active, the "cooking" of the rock caused chemical alterations in these iron compounds. Exposure to the elements caused the rocks to change colors. The rocks are, in effect, oxidizing; the canyon is rusting. The colors indicate the presence or absence of water in the individual iron compounds. Most of the yellows in the canyon are the result of iron present in the rock rather than sulfur, as many people think.

Canyon Area NPS Visitor Facilities

Canyon Visitor Education Center

Enter the new Canyon Visitor Education Center and the world of Yellowstone's supervolcano—an idea that has captured the minds and imaginations of people around the world. For the first time, park visitors will see, hear, and learn how the Yellowstone volcano, its geysers and hot springs, and geologic history shape the distribution and abundance of all life found here. Explore these ideas through interactive exhibits, animations, audio-visual productions, and real-time scientific data.

The unique exhibits include:

- A room-size relief model of Yellowstone that illuminates and narrates the park's volcanic eruptions, lava flows, glaciers, and earthquake faults for visitors on the first floor; from the second floor view, visitors can hear tribes associated with the park interpret the park's geology from their tribe's perspective.
- A 9,000 pound rotating globe illustrating global volcanic hotspots.
- One of the world's largest lava lamps illustrating how magma rises by heat convection.
- Computer-generated exhibits displaying real-time earthquake and other geologic data exactly at the same time it is being collected in the park.
- Murals and enlarged photographs showing the enormity of Yellowstone's glaciers and their lasting effect on the landscape.
- Detailed panoramas, dioramas, and cross sections of life in a lodgepole forest and a grassland—habitats made possible by Yellowstone's fire and ice.

Frequently Asked Questions at Canyon Village

Q. Where can I see the canyon/falls?

A. The Upper Falls can be seen from a viewpoint next to the parking lot for Uncle Tom's Trail or from the Brink of the Upper Falls Trail. The Lower Falls can be seen from Lookout, Artist, and Red Rock Points, and from a few places along the South Rim Trail.

Q. What causes the different colors in the canyon?

A. The colors are caused by the oxidation of iron compounds in the rhyolite rock, which has been hydrothermally altered. In essence, the canyon is rusting.

Q. Is there a place where I can see both falls at once?

A. Because the canyon bends between the Upper and Lower falls, there is no location where they can be seen at the same time, except from the air.

Q. How big is the canyon?

A. The canyon proper is roughly 20 miles long. It varies from 800 to 1,200 feet deep and is 1,500 to 4,000 feet wide.

Q. How can I get to the bottom of the canyon?

A. The only trail where one can hike to the bottom of the canyon in this area is the Seven Mile Hole Trail, a round trip of 11 strenuous miles. None of the shorter trails in the canyon area goes all the way to the bottom.

Q. How much water goes over the falls?

A. The volume of water going over the falls can vary from 5,000 gal/sec in the late fall to 63,500 gal/sec at peak runoff.

Q. What causes the green stripe in the Lower Falls?

A. The green stripe is actually the natural color of the water. There is a notch in the lip of the falls where the stripe is, making the water deeper at that point and keeping the water from becoming turbulent as it goes over the edge. The color of the water is a function of the depth, the angle at which you are looking at it, and the amount of light at that point.

Q. Who was Uncle Tom?

A. Uncle Tom Richardson was one of the first concessioners in the canyon area. He led people on guided trips into the canyon along a trail which is the present Uncle Tom's trail, using rope ladders to get to the bottom. He lost his permit in 1903 when the Chittenden Bridge was completed.

Q. Where was the old hotel?

A. The old Canyon Hotel was located about a mile south of Canyon Junction at the present site of the horse corrals.

Q. What is the height of the falls?

A. The Upper Falls is 109 ft.; the Lower Falls is 308 ft.

Q. What are the large birds flying in the canyon that look like eagles?

A. They are ospreys, or "fish hawks." They nest in the canyon from late April until late August or early September. Their nests can usually be seen from Grandview, Lookout, and Artist points.