

## Yellowstone Place-Based Travel Itinerary

This schedule is subject to change due to weather and/or road conditions, bison jams, participant fatigue, etc., while we are in Yellowstone National Park

Dates	Daily Activities
<b>Monday May 24</b>	<ul style="list-style-type: none"> <li>• Drive in to Yellowstone National Park entering through the south entrance from Jackson</li> <li>• <b>(~3:00 pm) Old Faithful Area</b> – one of the most popular destinations in Yellowstone, located in the Upper Geyser Basin. This region has the highest concentration of geysers in the world. <ul style="list-style-type: none"> <li>○ Visit Old Faithful Education Visitor Center</li> <li>○ Old Faithful Geyser and trail (Beehive, Morning Glory, Castle, Grand, Grotto, Riverside, et al.).</li> </ul> </li> <li>• <b>(~6:00 pm)</b> Check into hotel at West Yellowstone, MT</li> </ul>
<b>Tuesday May 25</b>	<p style="text-align: center;"><b>Travel to the upper loop of Yellowstone and Lamar Valley area</b></p> <ul style="list-style-type: none"> <li>• <b>(6:30 am)</b> leave West Yellowstone</li> <li>• <b>(~8:30 am) Tower Fall</b> – Scenic view of water plunging over the 132-foot fall.</li> <li>• <b>(~10:00 am) Calcite Springs</b> – Take a boardwalk to view the narrowest section of the Yellowstone River and observe columnar basalt rock which are over 1-million years old, and formed when basalt lava erupted, then slowly cooled and contracted, cracking into hexagonal pillars. Where the river has carved through 50 million years of volcanic rock and glacial deposits. Smell the sulfur.</li> <li>• <b>Lamar Valley – view Bison</b> <ul style="list-style-type: none"> <li>○ <b>(~11:00 am) Trout Lake</b> – This beautiful lake is accessible via a short but steep 1.2 - mile trail through a Douglas fir forest. Many River Otters frequent the lake that are quite used to people taking picture of them. Trout Lake has always been popular with anglers for its large Cutthroat trout and very large Rainbow trout.</li> <li>○ <b>(~12:30 pm) Yellowstone Picnic Area – Eat Lunch</b></li> </ul> </li> <li>• <b>Roosevelt Junction Area</b> <ul style="list-style-type: none"> <li>○ <b>(~2:00 pm) Petrified Tree</b> – ~ 50 million years ago, this area was buried beneath silica-rich ash and debris from the Absoroka Volcanics, preserving the tree in stone.</li> </ul> </li> <li>• <b>(~3:30 pm) Undine Falls</b> – Area where Lava Creek flows over a 700,000-year-old basalt lava flow which rests on top of weaker shale. Weaker rock beneath harder volcanic rock results in uneven erosion, creating the falls.</li> <li>• <b>(~5:00 pm) Sheepeater Cliff</b> – Columnar basalt from lava flow deposited about 500,000 years ago during one of the periodic basaltic floods in Yellowstone Caldera.</li> <li>• <b>(~6:30 pm)</b> arrive back at West Yellowstone</li> </ul>
<b>Wednesday May 26</b>	<p style="text-align: center;"><b>Travel to the lower loop east side of Yellowstone</b></p> <ul style="list-style-type: none"> <li>• <b>(6:30 am)</b> leave West Yellowstone</li> <li>• <b>Grand Canyon of the Yellowstone</b> – Approximately 20 miles long, the current canyon begins at the Lower Falls and ends at Tower Fall. The geology of the canyon is the result of erosion rather than the result of glaciation. After the caldera eruption of 640,000 years ago, the area was covered by a series of lava flows. The area was also faulted by the action of the caldera before the eruption. The canyon is the result of this faulting, which allows erosion to proceed at an accelerated rate. Rhyolite lava flows, extensive faulting, and heat beneath the surface all contribute to the chemical and heat action of the geyser basin. This causes rhyolite rock to become hydrothermally altered, making it very soft and brittle and more easily erodible. The present canyon is no more than 10-14 thousand years old. The Yellowstone River is the force that created the canyon and the falls. It is the longest undammed river in the continental U.S.</li> </ul>

	<p>The colors in the canyon are the result of hydrothermal alteration. The rhyolite in the canyon contains a variety of different iron compounds. The “cooking” of the rock causes chemical alterations in these iron compounds. Exposure to the elements causes 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.</p> <ul style="list-style-type: none"> <li>○ (~8:00 am) <b>Brink of the Lower Falls</b> (1½ miles) – Depending on the time of year, anywhere between 5,000 – 60,000 gallons per second of water plunges over the Falls.</li> <li>AND/OR</li> <li>○ <b>Lookout Point and Red Rock Point</b> (~1 mile)</li> <li>• (~11:00 am) <b>Mud Volcano and Sulphur Caldron areas</b> – (~ 1-mile boardwalk).       <ul style="list-style-type: none"> <li>○ The <b>Mud Volcano</b> is the location of several acidic, iron sulfide mud pots. Observe the density difference of the various mud pots.</li> <li>○ The <b>sulfur caldron</b> has a pH of 1.2 and a specific bacterium lives in this environment that produces a yellow-color which contrasts to the dark-gray or black of the iron sulfide springs.</li> </ul> </li> <li>• (~12:30) <b>Hayden Valley – Eat Lunch</b> at Nez Perce Ford Picnic Area. Some feel that Hayden Valley is the “heart” of the Yellowstone plateau. The largest valley in the park, it is really an old lake bed. Named after the geologist, Dr. Ferdinand Hayden.</li> <li>• (~2:00) <b>South Rim of the Grand Canyon of the Yellowstone</b> <ul style="list-style-type: none"> <li>○ <b>Artist Point</b> – A spectacular view of the canyon; the sheer walls drop 700 feet to the bottom of the canyon. The canyon walls are predominantly yellow but colors of blue, red, orange and brown are also seen. The colors are ever changing and especially intensified when the sun shines after a rain. Painter Thomas Moran sketched his famous 1872 depiction of the falls.</li> </ul> </li> <li>• (~4:00) <b>Canyon Village</b> – Visitor Center (if open)</li> <li>• (~5:30 pm) <b>Gibbon Falls</b> – where the Gibbon River plunges over the caldera rim. Because rhyolite is poor in nutrients, it weathers to a poor, dry soil that only lodgepole pines can tolerate.</li> <li>• (~6:30 pm) Arrive back in West Yellowstone</li> </ul>
<p><b>Thursday May 27</b></p>	<p><b>Travel to the upper loop and Mammoth Hot Springs area of Yellowstone</b></p> <ul style="list-style-type: none"> <li>• (7:00 am) leave West Yellowstone</li> <li>• (9:00 am) <b>Mammoth Hot Spring Terraces</b> –Travertine terraces are formed from limestone. Thermal water rises through the limestone, carrying high amounts of the dissolved limestone (CaCO<sub>3</sub>). At the surface, CO<sub>2</sub> is released and CaCO<sub>3</sub> is deposited, forming travertine, a chalky white mineral forming the rock of the terraces. Colorful stripes are formed by thermophiles. A large fault system runs between Norris Geyser Basin and Mammoth, which allows thermal water to flow between the two places.</li> </ul> <p><b>Ranger Talks: Native American Talk and Hot Springs Talk</b></p> <ul style="list-style-type: none"> <li>• 9:00 – 9:30 am – Group A: meets with Ranger1 for the Native American talk (lawn by the Visitor Center)</li> <li>• 9:00 – 9:30 am – Group B: meets with Ranger2 for the Hot Springs talk (near Hyman terrace, near bathrooms)</li> <li>• 9:45 – 10:15 am – Group A: meets with Ranger2 for the Hot Springs talk (near Hyman terrace, near bathrooms)</li> <li>• 9:45 – 10:15 am – Group B: meets with Ranger1 for the Native American talk (lawn by the Visitor Center)</li> <li>• (10:30 am) – <b>Water testing and Terrace walk</b> (two groups)       <ul style="list-style-type: none"> <li>○ Group 1 Water Testing while Group 2 participates in the Terrace Loop Walk, then</li> <li>○ Group 2 Water Testing while Group 1participates in the Terrace Loop Walk</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• (~12:00 am) <b>Eat lunch at Mammoth Hot Springs area</b> – Albright Visitor Center Lawn (visit with Yellowstone Ranger (blinded))</li> <li>• (~2:00 pm) <b>Roosevelt Arch, North Entrance (Gardiner, MT)</b> – Constructed under the supervision of the US Army and President Theodore Roosevelt in 1902. Be sure to read the top of the arch.</li> <li>• (~4:00 pm) <b>Artists Paintpots</b> – 1-mile trail through mineral and heat-loving microorganisms creating the full spectrum of colors</li> <li>• (~6:30 pm) arrive back at West Yellowstone</li> </ul>
<b>Friday May 28</b>	<p><b>Travel to lower loop west side, stop at Grand Prismatic on way out of Yellowstone</b></p> <ul style="list-style-type: none"> <li>• <b>Grand Prismatic</b> Overlook; Opened in July 2017. Deeper than a 10-story building. Very hot water travels 121 feet from a crack in the Earth to reach the surface of the spring. The third largest spring in the world, the Grand Prismatic is bigger than a football field. The hot spring has bright bands of orange, yellow, and green ring the deep blue waters. The multicolored layers get their hues from different species of thermophile bacteria living in the progressively cooler water around the spring. The deep blue center is caused by the fact that water scatters the blue wavelengths of light more than others, reflecting blues back to our eyes.</li> <li>• Leave Yellowstone through the south entrance – Safe travels home!</li> </ul>