Yellowstone Loadout Package

Yellowstone National Park "Heart Lake & Snake River" Expedition Loadout Package

By the AcadianX Outdoor Adventure Group

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Adventure Summary

First of it's Kind

"The Yelowstone Park is something absolutely unique in the world...This Park was created and is now administered for the benefit and enjoyment of the people...it is the property of Uncle Sam and therefore of us all."

- President Theodore Roosevelt - Speech dedicating the North Entrance Arch, April 1903.

Heart Lake/Snake River Trail

The Heart Lake - Snake River Loop is a diverse hike in the southern half of Yellowstone featuring incredible natural history, thermal activity, wildlife viewing opportunities, soaking in hot springs, and an ascent of Mount Sheridan.

Wildlife and Geology

Yellowstone National Park is the centerpiece of the 20 million acre/31,250 square-mile (8,093,712 ha/80,937 km2) Greater Yellowstone Ecosystem, a region that includes Grand Teton National Park, adjacent National Forests and expansive wilderness areas in those forests. The ecosystem is the largest remaining continuous stretch of mostly undeveloped pristine land in the contiguous United States, considered the world's largest intact ecosystem in the northern temperate zone. With the successful wolf reintroduction program, which began in the 1990s, virtually all the original faunal species known to inhabit the region when white explorers first entered the area can still be found there.

Fees & Permits

Fees need to be paid for the park entrance and to secure a backcountry itinerary. Entrance fees are paid on arrival whereas backcountry permits need to be paid and applied for at the Backcountry office prior to your trip beginning.

Regulations and Safety Considerations

When planning a backcountry trip, remember that many of Yellowstone's trails are more than 7,000 feet above sea level. Most areas retain snow until late May or early June, and some (especially mountain passes) are snow-covered until late July. Also, many routes require fording rivers that can be 25 feet wide, 3 to 6 feet deep, extremely cold, and swiftly running during our late spring runoff. It's hard to tell from a map whether a stream will be a raging torrent or merely a swollen creek.

Routes and Topography

We have packed in to this loadout a trove of maps and detailed descriptions for you to educate yourself on the layout of the expedition. Study and review the details so that you may know your way in case you are separated from your team.

Trekking/Camping Essentials and Gear

A complete list of essential gear and clothing are included in this loadout. To further assist you we have also included a checklist so that you may keep track of your acquired gear as well as manage your total weight.

Logistics

The logistics section provides spaces for you to inter the relevant logistics information when they become available. This information can include flight details, hotel information, and car rental details.

Preparation and Training

A short guide on how to prepare and considerations during the months leading up to your expedition. Also included are physical training advice and tips in order to physically prepare you for the challenges you may face.

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About Yellowstone National Park

General Information

Yellowstone National Park is an American national park located in Wyoming, Montana, and Idaho. It was established by the U.S. Congress and signed into law by President Ulysses S. Grant on March 1, 1872. Yellowstone was the first national park in the U.S. and is also widely held to be the first national park in the world. The park is known for its wildlife and its many geothermal features, especially Old Faithful geyser, one of its most popular features. It has many types of ecosystems, but the subalpine forest is the most abundant. It is part of the South Central Rockies forests ecoregion.

Native Americans have lived in the Yellowstone region for at least 11,000 years. Aside from visits by mountain men during the early-to-mid-19th century, organized exploration did not begin until the late 1860s. Management and control of the park originally fell under the jurisdiction of the Secretary of the Interior, the first being Columbus Delano. However, the U.S. Army was subsequently commissioned to oversee management of Yellowstone for a 30-year period between 1886 and 1916. In 1917, administration of the park was transferred to the National Park Service, which had been created the previous year. Hundreds of structures have been built and are protected for their architectural and historical significance, and researchers have examined more than a thousand archaeological sites.

Yellowstone National Park spans an area of 3,468.4 square miles (8,983 km2), comprising lakes, canyons, rivers and mountain ranges. Yellowstone Lake is one of the largest high-elevation lakes in North America and is centered over the Yellowstone Caldera, the largest super-volcano on the continent. The caldera is considered an active volcano. It has erupted with tremendous force several times in the last two million years. Half of the world's geysers and hydrothermal features are in Yellowstone, fueled by this ongoing volcanism. Lava flows and rocks from volcanic eruptions cover most of the land area of Yellowstone. The park is the centerpiece of the Greater Yellowstone Ecosystem, the largest remaining nearly-intact ecosystem in the Earth's northern temperate zone. In 1978, Yellowstone was named a UNESCO World Heritage Site.

Hundreds of species of mammals, birds, fish, and reptiles have been documented, including several that are either endangered or threatened. The vast forests and grasslands also include unique species of plants. Yellowstone Park is the largest and most famous megafauna location in the contiguous United States. Grizzly bears, wolves, and free-ranging herds of bison and elk live in this park. The Yellowstone Park bison herd is the oldest and largest public bison herd in the United States. Forest fires occur in the park each year; in the large forest fires of 1988, nearly one third of the park was burnt. Yellowstone has numerous recreational opportunities, including hiking, camping, boating, fishing and sightseeing. Paved roads provide close access to the major geothermal areas as well as some of the lakes and waterfalls. During the winter, visitors often access the park by way of guided tours that use either snow coaches or snowmobiles.

Hiking and Camping

Yellowstone National Park is one of America's premier wilderness areas. The park encompasses more than 2.2 million acres, has more than 900 miles (1,449 km) of hiking trails, and is primarily managed as wilderness. Beyond the developed areas, Yellowstone offers a diverse, mountainous landscape that invites exploration by foot, pack stock, and boat. Hundreds of miles of trails and over 300 designated backcountry campsites facilitate travel throughout the park, and permits are required for all overnight stays.

When planning a backcountry trip, remember that many of Yellowstone's trails are more than 7,000 feet above sea level. Most areas retain snow until late May or early June, and some (especially mountain passes) are snow-covered

until late July. Also, many routes require fording rivers that can be 25 feet wide, 3 to 6 feet deep, extremely cold, and swiftly running during our late spring runoff. It's hard to tell from a map whether a stream will be a raging torrent or merely a swollen creek.

History

The park contains the headwaters of the Yellowstone River, from which it takes its historical name. Near the end of the 18th century, French trappers named the river Roche Jaune, which is probably a translation of the Hidatsa name Mi tsi a-da-zi ("Yellow Rock River"). Later, American trappers rendered the French name in English as "Yellow Stone". Although it is commonly believed that the river was named for the yellow rocks seen in the Grand Canyon of the Yellowstone, the Native American name source is unclear.

The human history of the park begins at least 11,000 years ago when Native Americans began to hunt and fish in the region. During the construction of the post office in Gardiner, Montana, in the 1950s, an obsidian projectile point of Clovis origin was found that dated from approximately 11,000 years ago. These Paleo-Indians, of the Clovis culture, used the significant amounts of obsidian found in the park to make cutting tools and weapons. Arrowheads made of Yellowstone obsidian have been found as far away as the Mississippi Valley, indicating that a regular obsidian trade existed between local tribes and tribes farther east. By the time white explorers first entered the region during the Lewis and Clark Expedition in 1805, they encountered the Nez Perce, Crow, and Shoshone tribes. While passing through present day Montana, the expedition members heard of the Yellowstone region to the south, but they did not investigate it.

In 1806, John Colter, a member of the Lewis and Clark Expedition, left to join a group of fur trappers. After splitting up with the other trappers in 1807, Colter passed through a portion of what later became the park, during the winter of 1807–1808. He observed at least one geothermal area in the northeastern section of the park, near Tower Fall. After surviving wounds he suffered in a battle with members of the Crow and Blackfoot tribes in 1809, Colter described a place of "fire and brimstone" that most people dismissed as delirium; the supposedly imaginary place was nicknamed "Colter's Hell". Over the next 40 years, numerous reports from mountain men and trappers told of boiling mud, steaming rivers, and petrified trees, yet most of these reports were believed at the time to be myth.

Ferdinand V. Hayden (1829–1887) American geologist who convinced Congress to make Yellowstone a national park in 1872.

After an 1856 exploration, mountain man Jim Bridger (also believed to be the first or second European American to have seen the Great Salt Lake) reported observing boiling springs, spouting water, and a mountain of glass and yellow rock. These reports were largely ignored because Bridger was a known "spinner of yarns". In 1859, a U.S. Army Surveyor named Captain William F. Raynolds embarked on a two-year survey of the northern Rockies. After wintering in Wyoming, in May 1860, Raynolds and his party—which included naturalist Ferdinand Vandeveer Hayden and guide Jim Bridger—attempted to cross the Continental Divide over Two Ocean Plateau from the Wind River drainage in northwest Wyoming. Heavy spring snows prevented their passage, but had they been able to traverse the divide, the party would have been the first organized survey to enter the Yellowstone region. The American Civil War hampered further organized explorations until the late 1860s.

The first detailed expedition to the Yellowstone area was the Cook–Folsom–Peterson Expedition of 1869, which consisted of three privately funded explorers. The Folsom party followed the Yellowstone River to Yellowstone Lake. The members of the Folsom party kept a journal and based on the information it reported, a party of Montana residents organized the Washburn–Langford–Doane Expedition in 1870. It was headed by the surveyor-general

of Montana Henry Washburn, and included Nathaniel P. Langford (who later became known as "National Park" Langford) and a U.S. Army detachment commanded by Lt. Gustavus Doane.

The expedition spent about a month exploring the region, collecting specimens and naming sites of interest. A Montana writer and lawyer named Cornelius Hedges, who had been a member of the Washburn expedition, proposed that the region should be set aside and protected as a national park; he wrote detailed articles about his observations for the Helena Herald newspaper between 1870 and 1871. Hedges essentially restated comments made in October 1865 by acting Montana Territorial Governor Thomas Francis Meagher, who had previously commented that the region should be protected. Others made similar suggestions. In an 1871 letter from Jay Cooke to Ferdinand V. Hayden, Cooke wrote that his friend, Congressman William D. Kelley had also suggested "Congress pass a bill reserving the Great Geyser Basin as a public park forever".

Park Creation

In 1871, eleven years after his failed first effort, Ferdinand V. Hayden was finally able to explore the region. With government sponsorship, he returned to the region with a second, larger expedition, the Hayden Geological Survey of 1871. He compiled a comprehensive report, including large-format photographs by William Henry Jackson and paintings by Thomas Moran. The report helped to convince the U.S. Congress to withdraw this region from public auction. On March 1, 1872, President Ulysses S. Grant signed The Act of Dedication law that created Yellowstone National Park.

Hayden, while not the only person to have thought of creating a park in the region, was its first and most enthusiastic advocate. He believed in "setting aside the area as a pleasure ground for the benefit and enjoyment of the people" and warned that there were those who would come and "make merchandise of these beautiful specimens". Worrying the area could face the same fate as Niagara Falls, he concluded the site should "be as free as the air or Water." In his report to the Committee on Public Lands, he concluded that if the bill failed to become law, "the vandals who are now waiting to enter into this wonder-land, will in a single season despoil, beyond recovery, these remarkable curiosities, which have required all the cunning skill of nature thousands of years to prepare".

Hayden and his 1871 party recognized Yellowstone as a priceless treasure that would become rarer with time. He wished for others to see and experience it as well. Eventually the railroads and, sometime after that, the automobile would make that possible. The Park was not set aside strictly for ecological purposes; however, the designation "pleasure ground" was not an invitation to create an amusement park. Hayden imagined something akin to the scenic resorts and baths in England, Germany, and Switzerland.

THE ACT OF DEDICATION

AN ACT to set apart a certain tract of land lying near the headwaters of the Yellowstone River as a public park. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the tract of land in the Territories of Montana and Wyoming ... is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park or pleasuring ground for the benefit and enjoyment of the people; and all persons who shall locate, or settle upon, or occupy the same or any part thereof, except as hereinafter provided, shall be considered trespassers and removed there from ...

Approved March 1, 1872.

Signed by:

ULYSSES S. GRANT, President of the United States.

SCHUYLER COLFAX, Vice-President of the United States and President of the Senate.

JAMES G. BLAINE, Speaker of the House

There was considerable local opposition to the Yellowstone National Park during its early years. Some of the locals feared that the regional economy would be unable to thrive if there remained strict federal prohibitions against resource development or settlement within park boundaries and local entrepreneurs advocated reducing the size of the park so that mining, hunting, and logging activities could be developed. To

this end, numerous bills were introduced into Congress by Montana representatives who sought to remove the federal land-use restrictions.

After the park's official formation, Nathaniel Langford was appointed as the park's first superintendent in 1872 by Secretary of Interior Columbus Delano, the first overseer and controller of the park. Langford served for five years but was denied a salary, funding, and staff. Langford lacked the means to improve the land or properly protect the park, and without formal policy or regulations, he had few legal methods to enforce such protection. This left Yellowstone vulnerable to poachers, vandals, and others seeking to raid its resources. He addressed the practical problems park administrators faced in the 1872 Report to the Secretary of the Interior and correctly predicted that Yellowstone would become a major international attraction deserving the continuing stewardship of the government. In 1874, both Langford and Delano advocated the creation of a federal agency to protect the vast park, but Congress refused. In 1875, Colonel William Ludlow, who had previously explored areas of Montana under the command of George Armstrong Custer, was assigned to organize and lead an expedition to Montana and the newly established Yellowstone Park. Observations about the lawlessness and exploitation of park resources were included in Ludlow's Report of a Reconnaissance to the Yellowstone National Park. The report included letters and attachments by other expedition members, including naturalist and mineralogist George Bird Grinnell.

Grinnell documented the poaching of buffalo, deer, elk, and antelope for hides. "It is estimated that during the winter of 1874–1875, not less than 3,000 buffalo and mule deer suffer even more severely than the elk, and the antelope nearly as much."

As a result, Langford was forced to step down in 1877. Having traveled through Yellowstone and witnessed land management problems first hand, Philetus Norris volunteered for the position following Langford's exit. Congress finally saw fit to implement a salary for the position, as well as to provide a minimal funding to operate the park. Norris used these funds to expand access to the park, building numerous crude roads and facilities.

In 1880, Harry Yount was appointed as a gamekeeper to control poaching and vandalism in the park. Yount had previously spent decades exploring the mountain country of present-day Wyoming, including the Grand Tetons, after joining F V. Hayden's Geological Survey in 1873. Yount is the first national park ranger, and Yount's Peak, at the head of the Yellowstone River, was named in his honor. However, these measures still proved to be insufficient in protecting the park, as neither Norris, nor the three superintendents who followed, were given sufficient manpower or resources.

The Northern Pacific Railroad built a train station in Livingston, Montana, connecting to the northern entrance in the early 1880s, which helped to increase visitation from 300 in 1872 to 5,000 in 1883. Visitors in these early years faced poor roads and limited services, and most access into the park was on horse or via stagecoach. By 1908 visitation increased enough to attract a Union Pacific Railroad connection to West Yellowstone, though rail visitation fell off considerably by World War II and ceased around the 1960s. Much of the railroad line was converted to nature trails, among them the Yellowstone Branch Line Trail.

During the 1870s and 1880s Native American tribes were effectively excluded from the national park. Under a half-dozen tribes had made seasonal use of the Yellowstone area, but the only year-round residents were small bands of Eastern Shoshone known as "Sheepeaters". They left the area under the assurances of a treaty negotiated in 1868, under which the Sheepeaters ceded their lands but retained the right to hunt in Yellowstone. The United States never ratified the treaty and refused to recognize the claims of the Sheepeaters or any other tribe that had used Yellowstone.

The Nez Perce band associated with Chief Joseph, numbering about 750 people, passed through Yellowstone National Park in thirteen days during late August 1877. They were being pursued by the U.S. Army and entered the national park about two weeks after the Battle of the Big Hole. Some of the Nez Perce were friendly to the tourists and other people they encountered in the park; some were not. Nine park visitors were briefly taken captive. Despite Joseph and other chiefs ordering that no one should be harmed, at least two people were killed and several wounded. One of the areas where encounters occurred was in Lower Geyser Basin and east along a branch of the Firehole River to Mary Mountain and beyond. That stream is still known as Nez Perce Creek. A group of Bannocks entered the park in 1878, alarming park Superintendent Philetus Norris. In the aftermath of the Sheepeater Indian War of 1879, Norris built a fort to prevent Native Americans from entering the national park.

Ongoing poaching and destruction of natural resources continued unabated until the U.S. Army arrived at Mammoth Hot Springs in 1886 and built Camp Sheridan. Over the next 22 years the army constructed permanent structures, and Camp Sheridan was renamed Fort Yellowstone. On May 7, 1894, the Boone and Crockett Club, acting through the personality of George G. Vest, Arnold Hague, William Hallett Phillips, W. A. Wadsworth, Archibald Rogers, Theodore Roosevelt, and George Bird Grinnell were successful in carrying through the Park

Protection Act, which saved the park. The Lacey Act of 1900 provided legal support for the officials prosecuting poachers. With the funding and manpower necessary to keep a diligent watch, the army developed their own policies and regulations that permitted public access while protecting park wildlife and natural resources. When the National Park Service was created in 1916, many of the management principles developed by the army were adopted by the new agency. The army turned control over to the National Park Service on October 31, 1918.

In 1898, the naturalist John Muir described the park as follows: "However orderly your excursions or aimless, again and again amid the calmest, stillest scenery you will be brought to a standstill hushed and awe-stricken before phenomena wholly new to you. Boiling springs and huge deep pools of purest green and azure water, thousands of them, are plashing and heaving in these high, cool mountains as if a fierce furnace fire were burning beneath each one of them; and a hundred geysers, white torrents of boiling water and steam, like inverted waterfalls, are ever and anon rushing up out of the hot, black underworld."

Later History

Park Superintendent Horace M. Albright and dinner guests, 1922. The feeding of black bears was popular with tourists in the early days of the park, but led to 527 injuries between 1931 and 1939.

By 1915, 1,000 automobiles per year were entering the park, resulting in conflicts with horses and horse-drawn transportation. Horse travel on roads was eventually prohibited.

The Civilian Conservation Corps (CCC), a New Deal relief agency for young men, played a major role between 1933 and 1942 in developing Yellowstone facilities. CCC projects included reforestation, campground development of many of the park's trails and campgrounds, trail construction, fire hazard reduction, and fire-fighting work. The CCC built the majority of the early visitor centers, campgrounds and the current system of park roads.

During World War II, tourist travel fell sharply, staffing was cut, and many facilities fell into disrepair. By the 1950s, visitation increased tremendously in Yellowstone and other national parks. To accommodate the increased visitation, park officials implemented Mission 66, an effort to modernize and expand park service facilities. Planned to be completed by 1966, in honor of the 50th anniversary of the founding of the National Park Service, Mission 66 construction diverged from the traditional log cabin style with design features of a modern style. During the late 1980s, most construction styles in Yellowstone reverted to the more traditional designs. After the enormous forest fires of 1988 damaged much of Grant Village, structures there were rebuilt in the traditional style. The visitor center at Canyon Village, which opened in 2006, incorporates a more traditional design as well.

The 1959 Hebgen Lake earthquake just west of Yellowstone at Hebgen Lake damaged roads and some structures in the park. In the northwest section of the park, new geysers were found, and many existing hot springs became turbid. It was the most powerful earthquake to hit the region in recorded history.

In 1963, after several years of public controversy regarding the forced reduction of the elk population in Yellowstone, United States Secretary of the Interior Stewart Udall appointed an advisory board to collect scientific data to inform future wildlife management of the national parks. In a paper known as the Leopold Report, the committee observed that culling programs at other national parks had been ineffective, and recommended management of Yellowstone's elk population.

The wildfires during the summer of 1988 were the largest in the history of the park. Approximately 793,880 acres (321,272 ha; 1,240 sq mi) or 36% of the parkland was impacted by the fires, leading to a systematic re-evaluation of fire management policies. The fire season of 1988 was considered normal until a combination of drought and heat by mid-July contributed to an extreme fire danger. On "Black Saturday", August 20, 1988, strong winds expanded the fires rapidly, and more than 150,000 acres (61,000 ha; 230 sq mi) burned.

The expansive cultural history of the park has been documented by the 1,000 archeological sites that have been discovered. The park has 1,106 historic structures and features, and of these Obsidian Cliff and five buildings have been designated National Historic Landmarks. Yellowstone was designated an International Biosphere Reserve on October 26, 1976, and a UN World Heritage

Site on September 8, 1978. The park was placed on the List of World Heritage in Danger from 1995 to 2003 due to the effects of tourism, infection of wildlife, and issues with invasive species. In 2010, Yellowstone National Park was honored with its own quarter under the America the Beautiful Quarters Program.

Justin Ferrell explores three moral sensibilities that motivated activists in dealing with Yellowstone. First came the utilitarian vision of maximum exploitation of natural resources, characteristic of developers in the late 19th century. Second was the spiritual vision of nature inspired by the Romanticism and the transcendentalists in the mid-19th century. The twentieth century saw the biocentric moral vision that focuses on the health of the ecosystem as theorized by Aldo Leopold, which led to the expansion of federally protected areas and to the surrounding ecosystems.

The Heart Lake & Snake River Trail

Heart Lake Trail has two sections. The 1st half -- trailhead to Heart Lake and along the lake's western shore comprises one of the best, most popular trails in the park. The 2nd half -- south from Heart Lake to the Snake River is seldom traveled.

The trail begins gently rising through lodgepole forests and occasional meadows. This area was partially burned in 1988. Lodgepoles have an unusual way of coping with fire. Besides their annual seed cones, they produce a special "serotinous cone," which only opens at 113 F, allowing the forest to reseed following fire.

At the 4.5-mile mark, the trail breaks suddenly open and affords one of the most memorable vistas in all of Yellowstone. Hydrothermal activity is evident beneath you. As you peer down Witch Creek drainage, Heart Lake appears deceivingly close. In the next mile, the trail descends 500 feet through forests heavily burned by the 1988 fires.

At the 8-mile mark, the trail passes Heart Lake Ranger Station and reaches a junction with the Trail Creek Trail on the shores of Heart Lake. The Heart Lake Trail continues right (south) and follows the western shore. There are excellent campsites in the area.

Heart Lake covers 2150 acres and has a depth of 180 feet. It has a healthy population of native cutthroat trout and large lake trout. Less than 0.5 miles past the trail junction a large thermal area is spotted across a small meadow. To avoid marshy areas continue south on the trail until you pass the springs and reach the trees. Then follow the tree line out.

There are several geysers and a beautiful spring (Columbia Spring) in this group. Rustic Geyser, dormant since 1984, is the largest (25-to-30-foot) and most famous in Heart Lake Geyser Basin. Since 1984, the new star of the basin is Composite Geyser. Its 20-foot eruptions occur at intervals of 1 to 3 hours. Kickback and wait awhile. It's quite a thrill to have a geyser play just for you! A short distance beyond the geyser basin, the trail passes the Mount Sheridan Trail, then parallels the lake's western shore for several miles.

The 2nd half of the trail leaves Heart Lake, travels up and down, gradually descending 500 feet to the Snake River, passing Sheridan Lake at 11.5 mi., a junction with Basin Creek Cutoff Trail at 13 mi., and Basin Creek Lake at 14.5 mi. The final three miles of the trail follow Red Creek to its confluence with the Snake River. After fording the Snake, the trail terminates at a junction with the South Boundary Trail.

Wildlife

Yellowstone National Park is the centerpiece of the 20 million acre/31,250 square-mile (8,093,712 ha/80,937 km2) Greater Yellowstone Ecosystem, a region that includes Grand Teton National Park, adjacent National Forests and expansive wilderness areas in those forests. The ecosystem is the largest remaining continuous stretch of mostly undeveloped pristine land in the contiguous United States, considered the world's largest intact ecosystem in the northern temperate zone. With the successful wolf reintroduction program, which began in the 1990s, virtually all the original faunal species known to inhabit the region when white explorers first entered the area can still be found there.

Yellowstone is widely considered to be the finest megafauna wildlife habitat in the lower 48 states. There are almost 60 species of mammals in the park, including the timber wolf, coyote, the threatened Canadian lynx, and grizzly bears. Other large mammals include the bison (often referred to as buffalo), black bear, elk, moose, mule deer, white-tailed deer, mountain goat, pronghorn, bighorn sheep, and cougar.

American bison

The Yellowstone Park bison herd is the largest public herd of American bison in the United States. The relatively large bison populations are a concern for ranchers, who fear that the species can transmit bovine diseases to their domesticated cousins. In fact, about half of Yellowstone's bison have been exposed to brucellosis, a bacterial disease that came to North America with European cattle that may cause cattle to miscarry. The disease has little effect on park bison, and no reported case of transmission from wild bison to domestic livestock has been filed. However, the Animal and Plant Health Inspection Service (APHIS) has stated that bison are the "likely source" of the spread of the disease in cattle in Wyoming and North Dakota. Elk also carry the disease and are believed to have transmitted the infection to horses and cattle. Bison once numbered between 30 and 60 million individuals throughout North America, and Yellowstone remains one of their last strongholds. Their populations had increased from less than 50 in the park in 1902 to 4,000 by 2003. The Yellowstone Park bison herd reached a peak in 2005 with 4,900 animals. Despite a summer estimated population of 4,700 in 2007, the number dropped to 3,000 in 2008 after a harsh winter and controversial brucellosis management sending hundreds to slaughter. The Yellowstone Park bison herd is believed to be one of only four free roaming and genetically pure herds on public lands in North America. The other three herds are the Henry Mountains bison herd of Utah, at Wind Cave National Park in South Dakota and in Elk Island National Park in Alberta.

Elk mother nursing her calf.

To combat the perceived threat of brucellosis transmission to cattle, national park personnel regularly harass bison herds back into the park when they venture outside of the area's borders. During the winter of 1996–97, the bison herd was so large that 1,079 bison that had exited the park were shot or sent to slaughter. Animal rights activists argue that this is a cruel practice and that the possibility for disease transmission is not as great as some ranchers maintain. Ecologists point out that the bison are merely traveling to seasonal grazing areas that lie within the Greater Yellowstone Ecosystem that have

been converted to cattle grazing, some of which are within National Forests and are leased to private ranchers. APHIS has stated that with vaccinations and other means, brucellosis can be eliminated from the bison and elk herds throughout Yellowstone.

A reintroduced wolf in Yellowstone National Park

Starting in 1914, in an effort to protect elk populations, the U.S. Congress appropriated funds to be used for the purposes of "destroying wolves, prairie dogs, and other animals injurious to agriculture and animal husbandry" on public lands. Park Service hunters carried out these orders, and by 1926 they had killed 136 wolves, and wolves were virtually eliminated from Yellowstone. Further exterminations continued until the National Park Service ended the practice in 1935. With the passing of the Endangered Species Act in 1973, the wolf was one of the first mammal species listed. After the wolves were extirpated from Yellowstone, the coyote then became the park's top canine predator. However, the coyote is not able to bring down large animals, and the result of this lack of a top predator on these populations was a marked increase in lame and sick megafauna.

By the 1990s, the Federal government had reversed its views on wolves. In a controversial decision by the U.S. Fish and Wildlife Service (which oversees threatened and endangered species), northwestern wolves imported from Canada were reintroduced into the park. Reintroduction efforts have been successful with populations remaining relatively stable. A survey conducted in 2005 reported that there were 13 wolf packs, totaling 118 individuals in Yellowstone and 326 in the entire ecosystem. These park figures were lower than those reported in 2004 but may be attributable to wolf migration to other nearby areas as suggested by the substantial increase in the Montana population during that interval. Almost all the wolves documented were descended from the 66 wolves reintroduced in 1995–96. The recovery of populations throughout the states of Wyoming, Montana and Idaho has been so successful that on February 27, 2008, the U.S. Fish and Wildlife Service removed the Northern Rocky Mountain wolf population from the endangered species list.

Black bear and cub near Tower Fall

Black bears are common in the park and were a park symbol due to visitor interaction with the bears starting in 1910. Feeding and close contact with bears has not been permitted since the 1960s to reduce their desire for human foods. Yellowstone is one of the few places in the United States where black bears can be seen coexisting with grizzly bears. Black bear observations occur most often in the park's northern ranges and in the Bechler area which is in the park's southwestern corner.

As of 2017, an estimated 700 grizzly bears were living in the Greater Yellowstone Ecosystem, with about 150 grizzlies living wholly or partially within Yellowstone National Park. The grizzly was initially listed as a threatened species in the contiguous United States on July 28, 1975 by the Fish and Wildlife Service. The grizzly bear was taken off the endangered species list in 2007. Opponents of delisting the grizzly expressed concerns that states might once again allow hunting and that better conservation measures were needed to ensure a sustainable population. A federal district judge overturned the delisting ruling in 2009, reinstating the grizzly; however, the grizzly was once again removed from the list in 2017. In September 2018, a US district judge ruled that the grizzly's protections must be restored in full, arguing the Fish and Wildlife Service was mistaken in removing the bear from the threatened status list. Regardless of the rulings, hunting is prohibited within Yellowstone National Park. Hunters who legally hunt

animals outside park boundaries may transport the carcass through the park with a permit.

Elk in Hayden Valley

Population figures for elk are in excess of 30,000—the largest population of any large mammal species in Yellowstone. The northern herd has decreased enormously since the mid-1990s; this has been attributed to wolf predation and causal effects such as elk using more forested regions to evade predation, consequently making it harder for researchers to accurately count them. The northern herd migrates west into southwestern Montana in the winter. The southern herd migrates southward, and the majority of these elk winter on the National Elk Refuge, immediately southeast of Grand Teton National Park. The southern herd migration is the largest mammalian migration remaining in the U.S. outside of Alaska.

In 2003 the tracks of one female lynx and her cub were spotted and followed for over 2 miles (3.2 km). Fecal material and other evidence obtained were tested and confirmed to be those of a lynx. No visual confirmation was made, however. Lynx have not been seen in Yellowstone since 1998, though DNA taken from hair samples obtained in 2001 confirmed that lynx were at least transient to the park. Other less commonly seen mammals include the mountain lion and wolverine. The mountain lion has an estimated population of only 25 individuals park wide. The wolverine is another rare park mammal, and accurate population figures for this species are not known. These uncommon and rare mammals provide insight into the health of protected lands such as Yellowstone and help managers make determinations as to how best to preserve habitats.

Eighteen species of fish live in Yellowstone, including the core range of the Yellowstone cutthroat trout—a fish highly sought by anglers. The Yellowstone cutthroat trout has faced several threats since the 1980s, including the suspected illegal introduction into Yellowstone Lake of lake trout, an invasive species which consume the smaller cutthroat trout. Although lake trout were established in Shoshone and Lewis lakes in the Snake River drainage from U.S. Government stocking operations in 1890, it was never officially introduced into the Yellowstone River drainage. The cutthroat trout has also faced an ongoing drought, as well as the accidental introduction of a parasite—whirling disease—which causes a terminal nervous system disease in younger fish. Since 2001, all native sport fish species caught in Yellowstone waterways are subject to a catch and release law. Yellowstone is also home to six species of reptiles, such as the painted turtle and Prairie rattlesnake, and four species of amphibians, including the Boreal Chorus Frog.

311 species of birds have been reported, almost half of which nest in Yellowstone. In 1999, twenty-six pairs of nesting bald eagles were documented. Extremely rare sightings of whooping cranes have been recorded, however only three examples of this species are known to live in the Rocky Mountains, out of 385 known worldwide. Other birds, considered to be species of special concern because of their rarity in Yellowstone, include the common loon, harlequin duck, osprey, peregrine falcon and the trumpeter swan.

Geography and Geology

Geography

Approximately 96 percent of the land area of Yellowstone National Park is located within the state of Wyoming.[8] Another three percent is within Montana, with the remaining one percent in Idaho. The park is 63 miles (101 km) north to south, and 54 miles (87 km) west to east by air. Yellowstone is 2,219,789 acres (898,317 ha; 3,468 sq mi; 8,983 km2)[2] in area, larger than the states of Rhode Island or Delaware. Rivers and lakes cover five percent of the land area, with the largest water body being Yellowstone Lake at 87,040 acres (35,224 ha; 136 sq mi; 352 km2). Yellowstone Lake is up to 400 feet (120 m) deep and has 110 miles (180 km) of shoreline. At an elevation of 7,733 feet (2,357 m) above sea level, Yellowstone Lake is the largest high elevation lake in North America. Forests comprise 80 percent of the land area of the park; most of the rest is grassland.[8]

The Continental Divide of North America runs diagonally through the southwestern part of the park. The divide is a topographic feature that separates Pacific Ocean and Atlantic Ocean water drainages. About one third of the park lies on the west side of the divide. The origins of the Yellowstone and Snake Rivers are near each other but on opposite sides of the divide. As a result, the waters of the Snake River flow to the Pacific Ocean, while those of the Yellowstone find their way to the Atlantic Ocean via the Gulf of Mexico.

The park sits on the Yellowstone Plateau, at an average elevation of 8,000 feet (2,400 m) above sea level. The plateau is bounded on nearly all sides by mountain ranges of the Middle Rocky Mountains, which range from 9,000 to 11,000 feet (2,700 to 3,400 m) in elevation. The highest point in the park is atop Eagle Peak (11,358 feet or 3,462 metres) and the lowest is along Reese Creek (5,282 feet or 1,610 metres).[8] Nearby mountain ranges include the Gallatin Range to the northwest, the Beartooth Mountains in the north, the Absaroka Range to the east, the Teton Range to the south, and the Madison Range to the west. The most prominent summit on the Yellowstone Plateau is Mount Washburn at 10,243 feet (3,122 m).

Yellowstone National Park has one of the world's largest petrified forests, trees which were long ago buried by ash and soil and transformed from wood to mineral materials. This ash and other volcanic debris are believed to have come from the park area itself as the central part of Yellowstone is the massive caldera of a supervolcano. The park contains 290 waterfalls of at least 15 feet (4.6 m), the highest being the Lower Falls of the Yellowstone River at 308 feet (94 m).[8]

Three deep canyons are located in the park, cut through the volcanic tuff of the Yellowstone Plateau by rivers over the last 640,000 years. The Lewis River flows through Lewis Canyon in the south, and the Yellowstone River has carved two colorful canyons, the Grand Canyon of the Yellowstone and the Black Canyon of the Yellowstone in its journey north.

Geology

Volcanism

Yellowstone is at the northeastern end of the Snake River Plain, a great U-shaped arc through the mountains that extends from Boise, Idaho some 400 miles (640 km) to the west.

The volcanism of Yellowstone is believed to be linked to the somewhat older volcanism of Snake River plain.

Yellowstone is thus the active part of a hotspot that has moved northeast over time. The origin of this hotspot volcanism is disputed. One theory holds that a mantle plume has caused the Yellowstone hotspot to migrate northeast, while another theory explains migrating hotspot volcanism as the result of the fragmentation and dynamics of the subducted Farallon Plate in Earth's interior.

The Yellowstone Caldera is the largest volcanic system in North America. It has been termed a "supervolcano" because the caldera was formed by exceptionally large explosive eruptions. The magma chamber that lies under Yellowstone is estimated to be a single connected chamber, about 37 miles (60 km) long, 18 miles (29 km) wide, and 3 to 7 miles (5 to 12 km) deep. The current caldera was created by a cataclysmic eruption that occurred 640,000 years ago, which released more than 240 cubic miles (1,000 km³) of ash, rock and pyroclastic materials. This eruption was more than 1,000 times larger than the 1980 eruption of Mount St. Helens. It produced a caldera nearly five eighths of a mile (1 km) deep and 45 by 28 miles (72 by 45 km) in area and deposited the Lava Creek Tuff, a welded tuff geologic formation. The most violent known eruption, which occurred 2.1 million years ago, ejected 588 cubic miles (2,450 km³) of volcanic material and created the rock formation known as the Huckleberry Ridge Tuff and created the Island Park Caldera. A smaller eruption ejected 67 cubic miles (280 km³) of material 1.3 million years ago, forming the Henry's Fork Caldera and depositing the Mesa Falls Tuff.

Each of the three climactic eruptions released vast amounts of ash that blanketed much of central North America, falling many hundreds of miles away. The amount of ash and gases released into the atmosphere probably caused significant impacts to world weather patterns and led to the extinction of some species, primarily in North America.

A subsequent caldera-forming eruption occurred about 160,000 years ago. It formed the relatively small caldera that contains the West Thumb of Yellowstone Lake. Since the last supereruption, a series of smaller eruptive cycles between 640,000 and 70,000 years ago, has nearly filled in the Yellowstone Caldera with 80 different eruptions of rhyolitic lavas such as those that can be seen at Obsidian Cliffs and basaltic lavas which can be viewed at Sheepeater Cliff. Lava strata are most easily seen at the Grand Canyon of the Yellowstone, where the Yellowstone River continues to carve into the ancient lava flows. The canyon is a classic V-shaped valley, indicative of river-type erosion rather than erosion caused by glaciation.

Each eruption is part of an eruptive cycle that climaxes with the partial collapse of the roof of the volcano's partially emptied magma chamber. This creates a collapsed depression, called a caldera, and releases vast amounts of volcanic material, usually through fissures that ring the caldera. The time between the last three cataclysmic eruptions in the Yellowstone area has ranged from 600,000 to 800,000 years, but the small number of such climactic eruptions cannot be used to make an accurate prediction for future volcanic events.

Geysers and the Hydrothermal System

The most famous geyser in the park, and perhaps the world, is Old Faithful geyser, located in Upper Geyser Basin. Castle Geyser, Lion Geyser and Beehive Geyser are in the same basin. The park contains the largest active geyser in the world—Steamboat Geyser in the Norris Geyser Basin. A study that was completed in 2011 found that at least 1283 geysers have erupted in Yellowstone. Of these, an average of 465 are active in a given year.

Yellowstone contains at least 10,000 thermal features altogether. Half of the world's geysers and hydrothermal features are concentrated in Yellowstone.

In May 2001, the U.S. Geological Survey, Yellowstone National Park, and the University of Utah created the Yellowstone Volcano Observatory (YVO), a partnership for long-term monitoring of the geological processes of the Yellowstone Plateau volcanic field, for disseminating information concerning the potential hazards of this geologically active region.

In 2003, changes at the Norris Geyser Basin resulted in the temporary closure of some trails in the basin. New fumaroles were observed, and several geysers showed enhanced activity and increasing water temperatures. Several geysers became so hot that they were transformed into purely steaming features; the water had become superheated and they could no longer erupt normally. This coincided with the release of reports of a multiple year United States Geological Survey research project which mapped the bottom of Yellowstone Lake and identified a structural dome that had uplifted at some time in the past. Research indicated that these uplifts posed no immediate threat of a volcanic eruption, since they may have developed long ago, and there had been no temperature increase found near the uplifts. On March 10, 2004, a biologist discovered 5 dead bison which apparently had inhaled toxic geothermal gases trapped in the Norris Geyser Basin by a seasonal atmospheric inversion. This was closely followed by an upsurge of earthquake activity in April 2004. In 2006, it was reported that the Mallard Lake Dome and the Sour Creek Dome—areas that have long been known to show significant changes in their ground movement—had risen at a rate of 1.5 to 2.4 inches (3.8 to 6.1 cm) per year from mid–2004 through 2006. As of late 2007, the uplift has continued at a reduced rate. These events inspired a great deal of media attention and speculation about the geologic future of the region. Experts responded to the conjecture by informing the public that there was no increased risk of a volcanic eruption in the near future. However, these changes demonstrate the dynamic nature of the Yellowstone hydrothermal system.

Earthquakes

Yellowstone experiences thousands of small earthquakes every year, virtually all of which are undetectable to people. There have been six earthquakes with at least magnitude 6 or greater in historical times, including the 7.2-magnitude Hebgen Lake earthquake which occurred just outside the northwest boundary of the park in 1959. This quake triggered a huge landslide, which caused a partial dam collapse on Hebgen Lake; immediately downstream, the sediment from the landslide dammed the river and created a new lake, known as Earthquake Lake. Twenty-eight people were killed, and property damage was extensive in the immediate region. The earthquake caused some geysers in the northwestern section of the park to erupt, large cracks in the ground formed and emitted steam, and some hot springs that normally have clear water turned muddy. A 6.1-magnitude earthquake struck inside the park on June 30, 1975, but damage was minimal.

For three months in 1985, 3,000 minor earthquakes were detected in the northwestern section of the park, during what has been referred to as an earthquake swarm, and has been attributed to minor subsidence of the Yellowstone caldera. Beginning on April 30, 2007, 16 small earthquakes with magnitudes up to 2.7 occurred in the Yellowstone Caldera for several days. These swarms of earthquakes are common, and there have been 70 such swarms between 1983 and 2008. In December 2008, over 250 earthquakes were measured over a four-day span under Yellowstone Lake, the largest measuring a magnitude of 3.9. In January 2010, more than 250 earthquakes were detected over a two-day period. Seismic activity in Yellowstone National Park continues and is reported hourly by the Earthquake Hazards Program of the U.S. Geological Survey.

On March 30, 2014, a magnitude 4.8 earthquake struck almost the very middle of Yellowstone near the Norris Basin at 6:34 am; reports indicated no damage. This was the largest earthquake to hit the park since February 22, 1980.

Park Entrance Fees

Entrance Fee by car - 7 day permit

$35.00
(Winter Rate - $25.00, November 1 to April 30)

This is a entrance fee for all persons traveling in a single, private, non-commercial vehicle (car/truck/van). The permit is non-transferable. Visitors can enter the park at any time, if the entrance station is not staffed, a self-registration area is available for purchasing a 7-day park permit.

Entrance Fee - single entry

$20.00
(Winter Rate - $15.00, November 1 to April 30)

This is a per person entrance fee for a visitor traveling on foot, bicycle, or for individuals traveling together in a vehicle as a non-commercial, organized group. The permit is non-transferable.

Backcountry Permits

Walk-in Permits

Permits are required for all overnight stays and must be obtained in person no more than 48 hours in advance of a trip. From June through August, permits are available seven days a week from 8 am to 4:30 pm at the following locations:

Bechler Ranger Station

Bridge Bay Ranger Station

Canyon Visitor Center

Grant Village Visitor Center

Mammoth Visitor Center

Old Faithful Ranger Station

South Entrance Ranger Station

Tower Backcountry Office

West Yellowstone Visitor Information Center

To obtain the best information on trail conditions, pick up your permit at the office closest to where your trip begins. Backcountry permits for boating trips must be obtained at the Bridge Bay, Grant Village, or South Entrance backcountry offices.

During spring, fall, and winter, ranger stations and visitor centers do not have set hours. Contact the Central Backcountry Office (see below) for details on where to obtain a permit during these seasons.

Permit Fees

The following nightly fees are charged for trips between Memorial Day and September 10:

Backpackers/Boaters: $3/person/night (with a max of $15/night)

Stock Parties (horses/mules/llamas): $5/person/night (no max/night)

Permit fees are collected when you pick up your permit. Nightly fees are not charged for trips beginning outside of these dates. Nightly fees only apply for group members age 9 and older.

Annual Backcountry Pass

For individuals taking several or extended overnight trips in Yellowstone's backcountry, we offer an Annual Backcountry Pass for $25. Valid for one season (Memorial Day to September 10), the Annual Backcountry pass exempts individuals from the per-person per-night fee. You must present both the pass and photo ID for permit fees to be waived. The pass does not cover advanced reservations.

Advanced Permit Reservation

A portion of the park's 300+ backcountry campsites may be reserved in advance. Reservation are accepted from

January 1 to October 31 of each calendar year. Reservations received by March 31 will be processed in random order starting April 1. Reservations received on or after April 1 will be processed in the order they're received after the random lottery is complete.

We strongly encourage you to develop a second itinerary that may explore some less popular areas, in the event your first choice is not available. If you are camping with stock or requesting sites in one of our more popular areas such as Slough Creek or Yellowstone and Shoshone lakes, your chances of getting your first choices are best if you submit your request by April 1. Please submit only one request per party per trip. Duplicate applications slow down the reservation process and may result in duplicate charges, overlapping itineraries, and unused campsites.

Requests for reservations must be submitted by mail, fax, or in person. They cannot be made over the phone or by email. A confirmation notice (not a permit) will be emailed to you. This confirmation notice must be converted to the actual permit not more than 48 hours in advance of the first date on your itinerary.

A flat, nonrefundable fee of $25 is charged for each reservation. To make a reservation, download the Backcountry Permit Reservation Application or write to:

Backcountry Office
P.O. Box 168
Yellowstone National Park, WY 82190
307-344-2166 (fax)

Campsites

Each designated campsite has a maximum limit for the number of people and stock allowed per night. The maximum stay per campsite varies from 1 to 3 nights per trip. Group size limits range from 4 to 12 people. With the exception of four campsites, we allow only one group at each campsite. If your group size exceeds the campsite limit, you'll need to obtain a second permit and cook and sleep as separate groups. A food storage pole is provided at every campsite so that food and attractants may be secured from bears. Some sites have fire pits

Planning, Regulations, and Safety

Trip Planning

Beyond the developed areas, Yellowstone offers a diverse, mountainous landscape that invites exploration by foot, pack stock, and boat. Hundreds of miles of trails and over 300 designated backcountry campsites facilitate travel throughout the park, and permits are required for all overnight stays.

When planning a backcountry trip, remember that many of Yellowstone's trails are more than 7,000 feet above sea level. Most areas retain snow until late May or early June, and some (especially mountain passes) are snow-covered until late July. Also, many routes require fording rivers that can be 25 feet wide, 3 to 6 feet deep, extremely cold, and swiftly running during our late spring runoff. It's hard to tell from a map whether a stream will be a raging torrent or merely a swollen creek.

Trail Conditions

Trail conditions change frequently throughout the year, but the Yellowstone National Park's **Backcountry Situation Report** offer some seasonal generalizations as well as specific trail condition updates throughout the summer season, that will help you know what to expect in the backcountry.

Trail Closures

Hazardous or emergency conditions may make it necessary to close a trail segment. These closures may effect your planned itinerary. Backcountry rangers will make an effort to contact you on the trail to let you know your options and assist with route changes. It may take a while for everyone to be contacted. Do not enter any closed trail, even if it was part of your planned itinerary. See the **backcountry situation report.**

Backcountry Regulations

While in the backcountry, protect yourself and your park the following these regulations:

- Backcountry permits are required for all overnight stays in the backcountry. A Permit is valid only for the dates, sites and number of people listed on the permit.
- Camping outside designated sites, at sites for which you are not permitted, or within 100 feet of water sources is prohibited. Digging a trench or leveling the ground is prohibited.
- When not in use, secure all food and other smelly items by hanging them from the food poles provided at backcountry campsites (you'll need at least 35 feet of rope for this). Everything should hang 10 feet above ground and 4 feet away from tree trunks. Food storage lockers are provided at some sites.
- Certain portable bear resistant food containers (BRFCs) may be used for food storage in lieu of hanging. BRFCs can be hung or left on the ground underneath the food pole or in the cooking area. Make sure all food and odorous items will fit into a container before starting your trip.
- Carry out your trash: if you pack it in, pack it out.
- Bury human waste at least 100 feet from a water source, campsite, or trail. Putting items other than human waste and toilet paper in composting or pit toilets is prohibited.
- Open wood fires are permitted only in established fire rings at designated campsites. Use only dead and down wood which is wrist size or smaller so that it can be burned completely before you leave the campsite. Make certain the fire is cold before leaving your site. Restrictions may be in place due to dry conditions and forest fire danger. At some sites fires are not permitted any time of year; backpacking stoves are allowed at all campsites.

- Bathing, soaking or swimming in water entirely of thermal origin is prohibited.
- Polluting or contaminating any water source (with any soap, waste, food, etc.) is prohibited.
- Tossing, throwing, or rolling rocks or other items inside caverns, into valleys, canyons, or caves, down hillsides or mountain sides, or into thermal features is prohibited.
- Bicycles, wheeled vehicles (except wheelchairs), and motorized equipment are prohibited in the backcountry.
- Feeding or intentionally disturbing wildlife is prohibited.
- Pets are prohibited on all park trails, boardwalks, and in the backcounty.
- Weapons other than legally permitted firearms, and traps are prohibited in the backcountry.
- Collecting or disturbing natural features, plants, rocks, antlers, cultural, or archeological resources is prohibited.
- Impeding or disturbing horses or pack animals is prohibited.

Leave No Trace

Many of Glacier's backcountry camping regulations are based on Leave No Trace (LNT) outdoor ethics. LNT tells us that by concentrating impacts, including eating, sleeping, and human waste disposal, we prevent degradation of a broader area. Concentrating impacts essentially creates small pockets of impact and leaves nearly pristine conditions over larger areas. For more information **visit LNT.org.**

Backcountry Safety

Terrain Safety

Mountainous Terrain

Many accidents occur when people fall after stepping off trails or roadsides, or by venturing onto very steep slopes. Stay on designated trails and don't go beyond protective fencing or guard rails. Supervise children closely in such areas. At upper elevations, trails should be followed carefully, noting directions given by trail signs and markers.

Snow and Ice

Snowfields and glaciers present serious hazards. Snowbridges may conceal deep crevasses on glaciers or large hidden cavities under snowfields, and collapse under the weight of an unsuspecting hiker. Don't slide on snowbanks. People often lose control and slide into rocks or trees. Exercise caution around any snowfield.

Along the Roads

There are many great places to pull off to view wildlife and to take pictures. Along the sides of roads, please be careful of moving, alternating traffic. Also be careful of pedestrian crossings and visitors walking along the sides of roads as you drive by.

Weather

Yellowstone can experience winter-like weather any time of year. Calm, sunny mornings can abruptly turn into fierce, stormy days. Gusty, south-to-southwest winds are common in the afternoon. Rain and lightning often follow. If you're hiking or boating when storms approach, get off the water, ridges, and open places. Thick forests of equal height offer better protection from lightning than meadows. Nighttime temperatures can drop into the 30s and 40s. Depending on elevation, temperatures may even fall into the 20s with a light freeze...even in July. Summer daytime temperatures are usually in the 70s and 80s. June can be cool and rainy. July and August tend to be drier, with afternoon thundershowers common.

Thermal Features & Geyser Basins

Burns from thermal features are a common cause of serious injury and death in the park. Check at a ranger station before you go exploring. Foot travel in all thermal areas must be confined to boardwalks or maintained trails that are marked by official signs. Don't approach or shortcut through geyser basins after dark when there is

greater danger of stepping into a hot spring. For your safety and for the protection of thermal features in Yellowstone, it is illegal to swim or bathe in any water that is entirely of thermal origin. Hot springs contain algae, bacteria, and fungi found nowhere else in the world: soaking or wading in springs can destroy these life forms. Throwing objects like rocks or sticks into thermal features is prohibited since doing so can clog vents and alter the flow and temperature of the water. Food and smoking are not allowed in thermal areas.

Water Safety

Water is the number one cause of fatalities in Yellowstone National Park. Please use extreme caution near water. Swift, cold glacial streams and rivers, moss-covered rocks, and slippery logs all present dangers. Children, photographers, boaters, rafters, swimmers, and fishermen have fallen victim to these rapid, frigid streams and deep glacial lakes. Avoid wading in or fording swift streams. Never walk, play, or climb on slippery rocks and logs, especially around waterfalls. When boating, don't stand up or lean over the side, and always wear a lifejacket.

Stream Crossings

Few of Yellowstone's rivers or streams have bridges, and many cannot be crossed until July or later. Even in late summer, water levels can rise quickly after rainstorms or from snowmelt in the high country on warm afternoons. The water can be cold, fast, and more than thigh-deep, making any attempt to cross perilous. Trying to ford deep, swift water has resulted in loss of gear, injury, and death. Carefully check your itinerary on a topographic map for stream crossings, and ask about river conditions at a ranger station before beginning your trip. Don't be afraid to turn around if conditions are dangerous. Before you ford a river, make sure everyone in your group is comfortable doing so.

Hypothermia

Hypothermia, the "progressive physical collapse and reduced mental capacity resulting from the chilling of the inner core of the human body," can occur even at temperatures above freezing. Temperatures can drop rapidly. Exposure to frigid bodies of water and sudden mountain storms can turn a pleasant day into a bitterly cold and life-threatening experience. People in poor physical condition or who are exhausted are particularly at risk.

Preventing Hypothermia

- Avoid hypothermia by using water-resistant clothing before you become wet.
- Wear clothing that wicks moisture away.
- Minimize wind exposure and if your clothes become wet, replace them.
- Avoid sweating by dressing in layers, rather than in a single bulky garment.
- Pack a sweater, warm hat, and raingear for any hike.

The Warning Signs

- Uncontrolled shivering, slow or slurred speech, memory lapses and incoherence, lack of coordination such as immobile or fumbling hands, stumbling, a lurching gait, drowsiness, and exhaustion.

Immediate Treatment

- Seek shelter from weather and get the victim into dry clothes.
- Give warm non-alcoholic drinks.
- Build a fire and keep victim awake.
- Strip victim and yourself, and get into sleeping bag making skin-to-skin contact.
- If victim is semi-conscious or worse, get professional help immediately.

Drowning

Sudden immersion in cold water (below 80° F, 27° C) may trigger the "mammalian diving reflex." This reflex restricts blood from outlying areas of the body and routes it to vital organs like the heart, lungs, and brain. The colder the water, the younger the victim, and the quicker the rescue, the better the chance for survival. Some cold-water drowning victims have survived with no brain damage after being submerged for over 30 minutes.

Giardia

Giardiasis is caused by a parasite (*Giardia lamblia*) found in lakes and streams. Persistent, severe diarrhea,

abdominal cramps, and nausea are symptoms of this disease. If you experience any symptoms, contact a physician. When hiking, carry water from one of the park's treated water systems. If you plan to camp in the backcountry, follow recommendations received with your permit. Bring water to a boil or use an approved filter.

Wildlife Hazards

Yellowstone provides a wonderful opportunity to view animals in their natural setting. Along with this opportunity comes a special obligation for park visitors. With just a little planning and forethought, visitors can help ensure the survival of a threatened or endangered species. Always enjoy wildlife from the safety of your car or from a safe distance. Do not approach wildlife to take photographs. Every year visitors get too close to wildlife in order to get a picture. Sadly, injuries have occurred as a result. Use a telephoto lens instead. This will not only insure your safety, but the safety of the animal. And never approach a bear or get out of your car to get a picture of a bear.

Feeding, harassing, or molesting wildlife is strictly prohibited and subject to fine. Bears, mountain lions, goats, deer, or any other species of wildlife can present a real and painful threat, especially females with young.

For most wildlife, like moose, elk, bighorn sheep mountain goats, deer, and coyotes, visitors are to be at least 75 feet (25 yards/23 meters) away. For wolves, grizzly and black bears, visitors need to be at least 300 feet (100 yards/91.4 meters) away.

Ticks

From mid-March to mid-July, grassy, brushy, low elevation areas (4,000–6,500 feet) are ideal tick habitat in Yellowstone. Wear repellent even on shoes, socks, cuffs, and pant legs. Tuck your pant legs into your socks and your shirt into your pants. Check your clothes and your body often. During the June and July, mosquitoes may be widespread around lakes and streams, especially in wet areas. Mosquitoes tend to diminish in mid-to-late August. Repellents, netting, and wearing clothing with long pants and sleeves are the best options for enduring insects in Yellowstone.

Rodents and Hantavirus

Deer mice are possible carriers of Hantavirus. The most likely source of infection is from rodent urine and droppings inhaled as aerosols or dust. Initial symptoms are almost identical to the onset of flu. If you have potentially been exposed and exhibit flu-like symptoms, you should seek medical care immediately. Avoid rodent infested areas. Camp away from possible rodent burrows or shelters (garbage dumps and woodpiles), and keep food in rodent-proof containers. To prevent the spread of dust in the air, spray the affected areas with a water and bleach solution (1½ cups bleach to one gallon of water).

Bear Safety

It is quite reasonable to fear bears, but be aware that many bear stories are greatly exaggerated. Your chances of being injured on the way to the backcountry are actually far greater than being injured by a bear. However, people have been injured and killed by bears in the wild. Your safety is not guaranteed. Read the information below to learn good bear avoidance behavior. Most attacks are caused by surprising a bear, getting between a mother bear and her cubs, or getting too close to a bear with food. The chances of being attacked by a bear can be reduced by avoiding the above situations and taking the following precautions:

- **Be alert.** Watch for tracks, excrement, diggings or other bear sign. Carry binoculars and scan ahead periodically. If you see a bear cub, the mother is close by.
- **Don't hike alone or at night.** Bears travel (often on the trails) and feed mainly at dawn, dusk, and at night. Statistics show that parties of three or more are safer than solo hikers. Groups tend to make more noise and appear more formidable to a bear. Also, if there is an attack, members of the group can assist the injured while others go for help.
- **Make noise.** Talk, sing, clap your hands, shake pebbles in a can, anything to let a bear know you are present. Don't rely on bells; usually they are too quiet. Shout often, especially when traveling upwind, near streams, or in thick brush.
- **Stay on designated trails.** You increase your risk of surprising a bear when hiking off-trail.
- **Avoid carcasses.** Never camp in a campsite that has a carcass nearby. It is very risky to approach a carcass; a bear may be out of sight guarding its food. Report dead animals near a trail or campsite to the nearest ranger station.
- **Avoid bringing smelly food.** A bear's acute sense of smell can detect odors from great distances. Leave bacon, tuna, ham, scented deodorants and other odorous items behind. Dry foods are lighter to carry and not as aromatic.

If you encounter a bear:

- Stay calm
- Do not run or make sudden movements
- Back away slowly
- Talk quietly to the bear, do not shout
- Do not drop your pack
- Avoid looking directly at the bear

If you encounter a bear and it does not see you, keep out of sight and detour as far away as possible behind and downwind of the bear. Climbing a tree is popular advice, but not always practical. All black bears, all grizzly cubs, and some adult grizzlies can climb trees if the spacing of the branches is right. Climb a tree only if the bear is far away, the tree is nearby, and one in which you can climb at least 15 feet. Running to a tree may provoke a bear to chase you. You cannot outrun a bear!

If the bear charges you, stand your ground and use bear spray if you have it. Some bears may bluff charge, then veer off or stop abruptly, allowing you to slowly back away. If the bear makes physical contact, drop to the ground, lie face down, and clasp your hands behind your neck; your pack may shield your body. It may take all the courage you have, but lie still and remain silent, resistance will only provoke the bear. Before moving listen and look around carefully to make sure that the bear is no longer nearby.

In exceptionally rare circumstances a bear may come to view humans as prey. This is often a hiker's biggest fear, but this type of encounter is extremely rare. If you feel that a bear has been following you, be firm and aggressive, look big, yell, throw rocks or sticks, and use bear spray.

Night attacks on tents are extremely rare, but if this happens you should defend yourself aggressively. Any bear entering your tent at night doesn't have good intentions; if it attacks fight back with any resource you have available to show that you are not easy prey.

Food and Bears

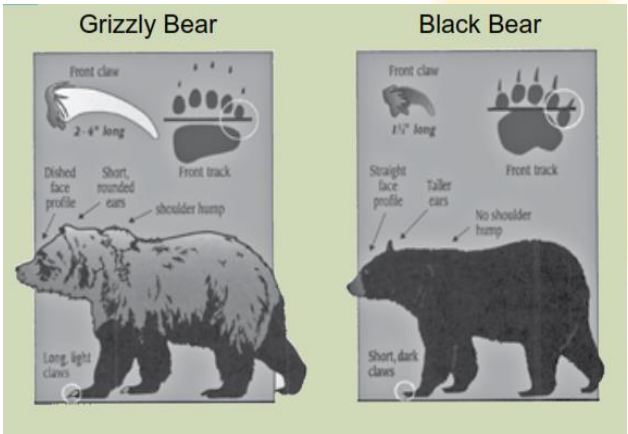
Don't let your actions cause a bear or other animal to be destroyed. A bear has an acute sense of smell. If you leave food out and unattended, you are inviting a bear into your camp. Just one incident of a bear obtaining human food may mean a dead bear. Why? A bear conditioned to human food is more likely to be aggressive and, subsequently, to injure or kill people in an attempt to obtain this easy source of food. When such a bear poses a risk of injuring someone, it is often necessary to destroy that bear.

Samples of odorous items which you are required to hang include all food, garbage, empty or full beverage cans, coolers, lip balm, sunscreens and lotions, toothpaste, food panniers, horse feed, some medications, clothes worn while cooking, eating utensils which have not been properly cleaned, and any article that has an odor. Keep all food and odorous items out of sleeping bags, tents, and their stuff sacks.

Before starting a day hike or backcountry trip check at a Visitor Center or Ranger Station for any recent bear sightings or warnings. Look for posted warning signs at the trailhead. Report bear sightings or encounters to the nearest Ranger Station or Visitor Center.

Do You Know Your Bears?

A line drawn under the big toe across the top of the pad runs through the top half of the little toe on black bear tracks and through or below the bottom half of the little toe on grizzly tracks.



Bear Pepper Sprays

The best way to avoid being injured by a bear is to take all the necessary precautions. However, if these measures fail and you are charged by a bear, your reactions can, in many cases, defuse the situation. Bear spray is a good last line of defense that has been highly effective in the reported cases where it was used. The use of bear spray is especially appropriate if you are attacked in your tent at night. If you successfully used pepper spray to stop a bear, leave the area immediately. The spray is effective for a short time and is less effective the second time around. Bear Spray is effective only at distances of 10 – 30 feet and is adversely affected by wind, cold temperatures, and age. Carefully read the instructions, know how to use the spray and aware of its limitations. Be sure to check the expiration date. If you decide to carry bear spray the canister must be immediately available, not in your pack.

In choosing a pepper spray please consider the following: Purchase only products clearly labeled "for deterring attacks by bears." Concentration should be between 1 and 2% capsaicin. The minimum net weight should be 225 grams or 7.9 oz. The spray should be delivered in a shotgun-cloud pattern at a minimum range of 25 feet and EPA approved.

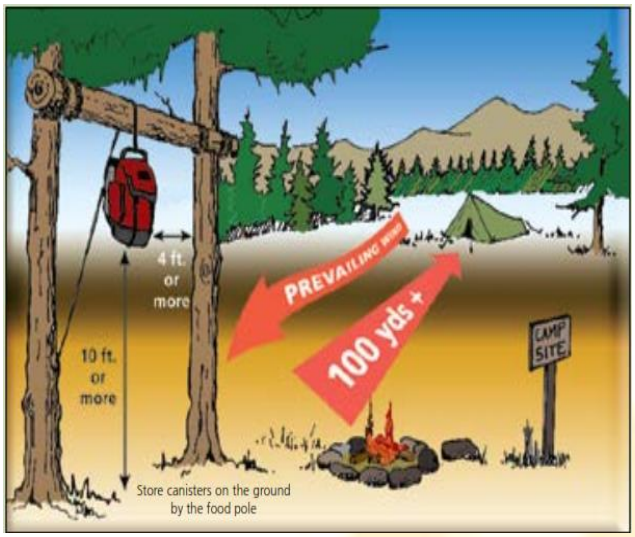
Although bear sprays have been highly effective at stopping charging bears, there are some indications that the residue from some oil-based sprays may possibly act as a bear attractant. Use your spray only as a last ditch deterrent on the bear. Do not spray around your campsite, tent, camping gear, or in any bear habitat.

Recommended Camp Set Up in Bear Country

Keep your sleeping area at least 100 yards from the cooking and food-storage area. A food storage pole is provided at most campsites, so that food and other attractants can be suspended. You need to provide your own rope (35 feet recommended).

- Suspend items 10 feet above ground and 4 feet out from tree trunks.
- Certain portable bear resistant food containers (BRFCs) may be used for food storage in lieu of hanging. A list of approved containers is available from park backcountry offices.
- BRFCs must be left on the ground underneath the food pole or in the cooking area.
- Make sure all food and odorous items will fit into a container before starting your trip. Store your food immediately upon entering camp and keep all food and trash secured any time they're not in use.
- Store all odorous items including food, trash, toothpaste, deodorant and lotion.
- Keep a clean camp; remove any food scraps and trash from the fire pit. Pack out all trash.
- Strain food particles from dishwater and pack out with trash. Scatter dishwater at least 100 yards from tent site.
- Never eat or store food in your tent. Sleep in a tent, not under the stars.

- Avoid placing your tent near dead standing trees.



Mountain Lion Safety

A glimpse of one of these magnificent cats would be a vacation highlight, but you need to take precautions to protect you and your children from an accidental encounter.

- Don't hike alone.
- Make noise to avoid surprising a lion and keep children close to you at all times.
- If you do encounter a lion, do not run. Talk calmly, avert your gaze, stand tall, and back away. Unlike with bears, if attack seems imminent, act aggressively. Do not crouch and do not turn away. Lions may be scared away by being struck with rocks or sticks, or by being kicked or hit.

Lions are primarily nocturnal, but they have attacked in broad daylight. They rarely prey on humans, but such behavior occasionally does occur. Children and small adults are particularly vulnerable. Report all mountain lion encounters immediately!

Leave No Trace

Developed by the National Outdoor Leadership School, the principles of Leave No Trace are an extension of the National Park Service mission to preserve a vast system of resources "unimpaired for the enjoyment of future generations" that challenge individuals to become active stewards in its preservation. The Program builds awareness, appreciation, and respect for the land, and provides a foundation for applying minimum-impact techniques.

Plan Ahead and Prepare

- Know the regulations and restrictions for the area you visit.
- Prepare for extreme weather, hazards, and emergencies.
- Select terrain and mileage based on what your group can handle.
- Schedule your trip to avoid times of high use.
- As you look through the campsite list in this planner, please note the party size limit that pertains to each campsite. If your group size exceeds these limits, you will need to camp and cook as smaller groups in separate campsites with separate permits.
- Repackage food to minimize waste.

Travel and Camp on Durable Surfaces

- To prevent erosion, avoid shortcuts and switchbacks.
- Walk single file in the middle of the trail, even when wet or muddy.
- Camp in designated campsites.
- Protect riparian areas by camping at least 100 feet from lakes and streams.
- Keep campsites small. Focus activity in areas where vegetation is absent. Avoid leveling the tent site.

Dispose of Waste Properly

- Pack it in, pack it out. Inspect your campsite and rest areas for trash or spilled foods. Never bury it or dump it in pit toilets. Pack out all trash, leftover food, and litter.
- To wash yourself or your dishes, carry water 100 feet away from streams or lakes and use small

amounts of biodegradable soap. Scatter strained dishwater.

- Deposit solid human waste in catholes dug 6 to 8 inches deep at least 100 feet from water, camp, and trails. Cover and disguise the cathole when finished.
- Pack out toilet paper and hygiene products.

Respect Wildlife

- Do not approach wildlife. All wild animals are potentially dangerous. Observe Wildlife from a distance. If your presence causes an animal to move away, you are too close.
- Never feed or harass animals. Feeding wildlife damages their health, alters natural behaviors, and exposes them to predators and other dangers.
- Protect wildlife and your food by storing rations and trash securely.
- Avoid wildlife during sensitive times: mating, nesting, raising young, or winter.

Minimize Campfire Impacts

- Campfires can cause lasting impacts to the backcountry. Use a lightweight stove for cooking and enjoy a candle lantern for light.
- Where fires are permitted, use established fire rings, fire pans, or mound fires. Campfires are only permitted in specified campsites in designated fire rings.
- Keep fires small. Burn only small diameter dead and down wood. Do not break, cut or saw branches from any standing tree (dead or alive).
- Burn all wood and coals to ash, put out campfires completely. Fires must be completely extinguished before you leave the site.

Leave What You Find

- Avoid introducing or transporting non-native species.
- Do not build structures, furniture, or dig trenches.
- Federal law prohibits: collecting antlers; removing any plant, animal, or mineral substance; and disturbing or removing archeological or historical items. Leave natural objects as you find them.

Be Considerate of Other Visitors

- Respect other visitors and protect the quality of their experience.
- Be courteous. Yield to other users on the trail.
- Step to the downhill side of the trail when encountering pack stock.
- Take breaks and camp away from trails and other visitors.
- Let nature's sounds prevail. Avoid loud voices and noises.

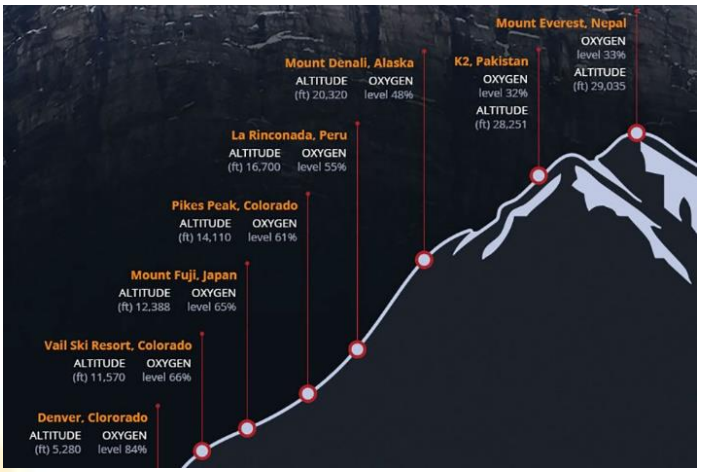
Altitude Sickness

Altitude sickness, the mildest form being acute mountain sickness (AMS), is the negative health effect of high altitude, caused by rapid exposure to low amounts of oxygen at high elevation. Symptoms may include headaches, vomiting, tiredness, trouble sleeping, and dizziness. Acute mountain sickness can progress to high altitude pulmonary edema (HAPE) with associated shortness of breath or high altitude cerebral edema (HACE) with associated confusion. Chronic mountain sickness may occur after long term exposure to high altitude.

Altitude sickness typically occurs only above 2,500 meters (8,000 ft), though some are affected at lower altitudes such as 6,000 feet. Risk factors include a prior episode of altitude sickness, a high degree of activity, and a rapid increase in elevation. Diagnosis is based on symptoms and is supported in those who have more than a minor reduction in activities. It is recommended that at high-altitude any symptoms of headache, nausea, shortness of breath, or vomiting be assumed to be altitude sickness.

Prevention is by gradually increasing elevation by no more than 300 meters (1,000 ft) per day. Pre-medicating with the drug acetazolamide (trade name Diamox) may help some people making a rapid ascent to sleeping altitude above 2,700 meters (9,000 ft), and it may also be effective if started early in the course of AMS. Acetazolamide can be taken before symptoms appear as a preventive measure at a dose of 125 mg twice daily. Consult with your doctor to explore this option. Being physically fit does not decrease the risk. Treatment is generally by descending to a lower altitude and sufficient fluids. Mild cases may be helped by ibuprofen, acetazolamide, or dexamethasone. Prior to the onset of altitude sickness, ibuprofen is a suggested non-steroidal anti-inflammatory and painkiller that can help alleviate both the headache and nausea associated with AMS. Severe cases may benefit from oxygen therapy and a portable hyperbaric bag may be used if descent is not possible.

AMS occurs in about 20% of people after rapidly going to 2,500 meters (8,000 ft) and 40% of people going to 3,000 meters (10,000 ft). While AMS and HACE occurs equally frequently in males and females, HAPE occurs more often in males.



Weather

Since most of the park lies at an elevation of 6,000 feet (1829 m) above sea level or higher, unpredictability characterizes Yellowstone's weather. Expect big temperature swings, rain, or snow during every month of the year. No matter when you visit, bring a warm jacket, rain gear, and lots of layers.

Spring & Fall

Daytime temperatures range from 30°F to the 60°F (0°C to 20°C) with overnight lows in the teens to single digits (-5°C to -20°C). Snow is common in the spring and fall with regular accumulations of 12 inches (30.5 cm) in a 24-hour period.

Summer

Daytime temperatures are often around 70°F (25°C) and occasionally 80°F (30°C) at lower elevations. Nights are usually cool and temperatures may drop below freezing at higher elevations. Thunderstorms are common in the afternoons.

Winter

Temperatures range from zero to 20°F (-20°C to -5°C) throughout the day. Sub-zero temperatures are common, especially at night and at higher elevations. The record low temperature is -66°F (-54°C). Snowfall is highly variable. While the average is 150 inches (381 cm) a year, it is not uncommon for higher elevations to get twice that amount.

Forecasts

The weather in Yellowstone can change quickly and can deviate considerably from the forecast, so prepare for all conditions when planning your adventure. For additional details or other forecasts, visit the **National Weather Service**.

Climate

Climate consists of the long-term averages of daily weather, usually in 30-year periods. Learn how the **climate is changing** in Yellowstone.

- **Yellowstone Climate At-A-Glance**

YELLOWSTONE PARK, WYOMING (489905)

Period of Record Monthly Climate Summary

Period of Record : 8/ 1/1948 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	29.5	34.0	40.1	49.6	60.4	69.5	80.2	78.7	68.0	55.5	38.8	30.6	52.9
Average Min. Temperature (F)	10.2	12.9	17.8	26.0	34.2	41.2	47.0	45.4	37.4	29.4	19.4	12.2	27.8
Average Total Precipitation (in.)	1.05	0.70	1.05	1.18	1.94	2.07	1.43	1.34	1.23	1.00	1.02	0.96	14.97
Average Total SnowFall (in.)	14.6	9.7	12.6	6.0	1.5	0.2	0.0	0.0	0.5	3.3	9.5	13.0	70.9
Average Snow Depth (in.)	8	8	5	1	0	0	0	0	0	0	2	4	2

Percent of possible observations for period of record.
Max. Temp.: 93.3% Min. Temp.: 93.6% Precipitation: 95.1% Snowfall: 90.7% Snow Depth: 86.9%

SNAKE RIVER, WYOMING (488315)

Period of Record Monthly Climate Summary

Period of Record : 8/ 1/1948 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	26.0	31.0	37.6	46.9	56.9	67.3	77.3	76.4	66.6	52.8	35.9	26.5	50.1
Average Min. Temperature (F)	0.3	0.6	8.1	18.5	27.1	33.4	37.5	35.3	27.1	19.9	9.8	0.5	18.2
Average Total Precipitation (in.)	4.22	3.12	2.77	2.31	2.62	2.41	1.58	1.61	1.69	2.08	3.21	4.29	31.91
Average Total SnowFall (in.)	55.7	45.3	35.8	18.9	6.4	0.9	0.0	0.0	0.7	9.5	37.0	58.5	268.6
Average Snow Depth (in.)	43	55	57	42	10	0	0	0	0	1	9	28	20

Percent of possible observations for period of record.
Max. Temp.: 75.8% Min. Temp.: 75.9% Precipitation: 76.2% Snowfall: 74.7% Snow Depth: 75.1%

Yellowstone Monthly Averages

	Average High Temperature		Average Low Temperature		Average Precipitation		Average Total Snow Fall	
Month	**°F**	**°C**	**°F**	**°C**	**Inches**	**cm**	**Inches**	**cm**
January	28.6	-1.9	9.6	-12.4	1.1	2.8	14.5	36.8
February	34.0	1.1	13.0	-10.6	0.75	1.9	10.4	26.4
March	39.6	4.2	17.2	-8.2	1.1	2.8	13.1	33.3
April	49.4	9.7	26.0	-3.3	1.2	3.0	5.9	15.0
May	60.4	15.8	34.3	1.3	2.0	5.1	1.5	3.8
June	70.0	21.1	41.2	5.1	1.5	3.8	0.1	0.3
July	79.6	26.4	46.7	8.2	1.5	3.8	0.0	0
August	78.3	25.7	45.3	7.4	1.4	3.6	0.0	0
September	67.8	19.9	37.0	2.8	1.3	3.3	0.5	1.3
October	55.7	13.2	29.4	-1.4	1.0	2.5	3.7	9.4
November	38.7	3.7	19.2	-7.1	1.0	2.5	9.0	22.9
December	30.5	-0.8	11.8	-11.2	1.0	2.5	13.5	34.3
Annual	52.8°F	11.6°C	27.6°F	-2.4°C	15.4"	39.1 cm	72.1	183.1 cm

The Expedition

Adventurer Charles Cook, on an 1869 expedition to the Yellowstone Country observed: "I sat there in amazement, while my companions came up, and after that it seemed to me it was five minutes before anyone spoke. Language is inadequate to convey a just conception of the grandeur and sublimity of this masterpiece of nature's handiwork."

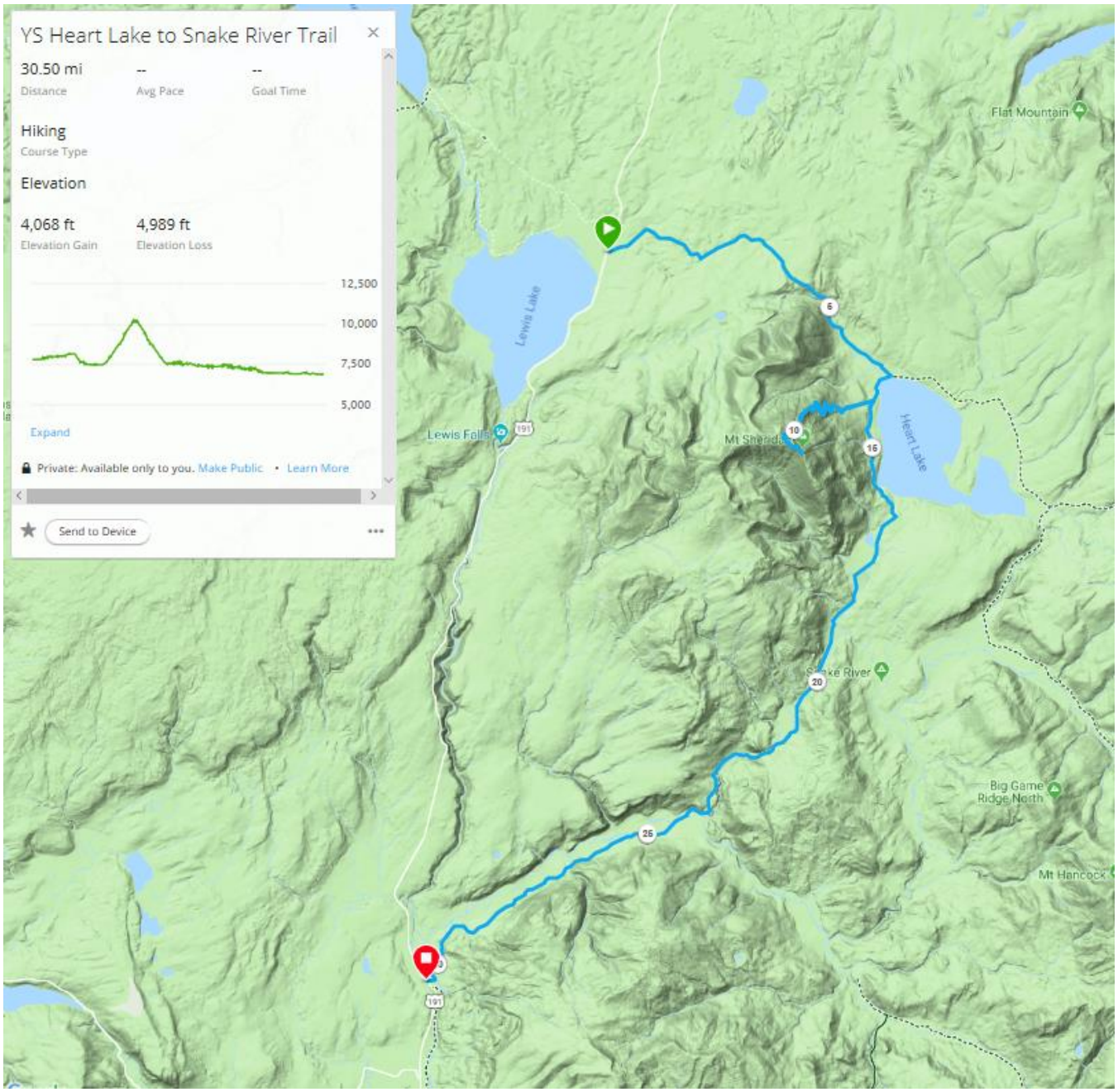
A masterpiece indeed, three years later President Ulysses S. Grant signed the world's first national park into existence. Today, at 2.2 million acres, the park is home to two-thirds of the world's geysers and geothermal features, and represents the most biologically diverse mid-latitude mountain ecosystem on the planet. Of course it's also important as a living legacy to this country's extraordinary beauty and richness.

The Heart Lake - Snake River Loop is a diverse hike in the southern half of Yellowstone featuring incredible natural history, thermal activity, wildlife viewing opportunities, soaking in hot springs, and an ascent of Mount Sheridan.

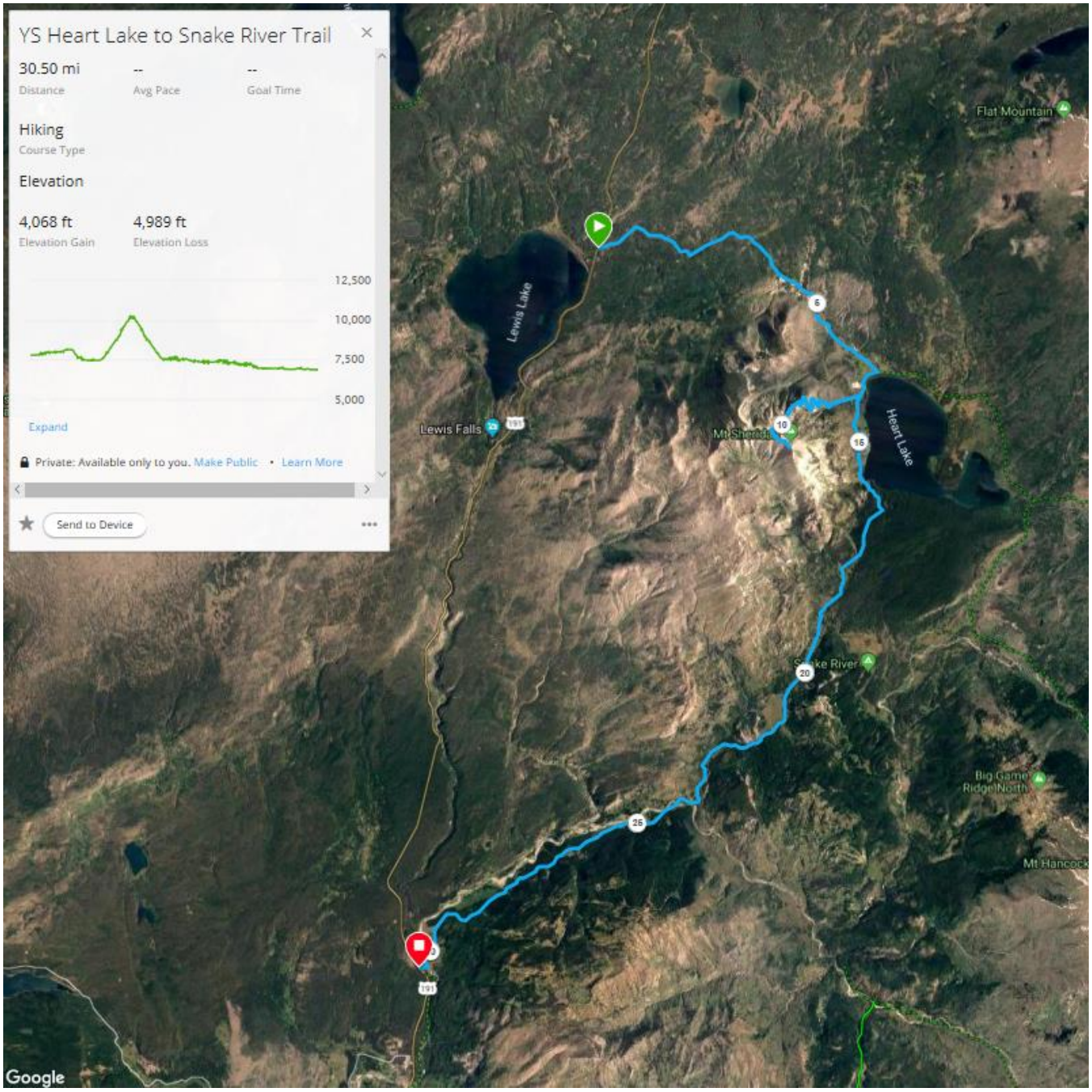
Itinerary

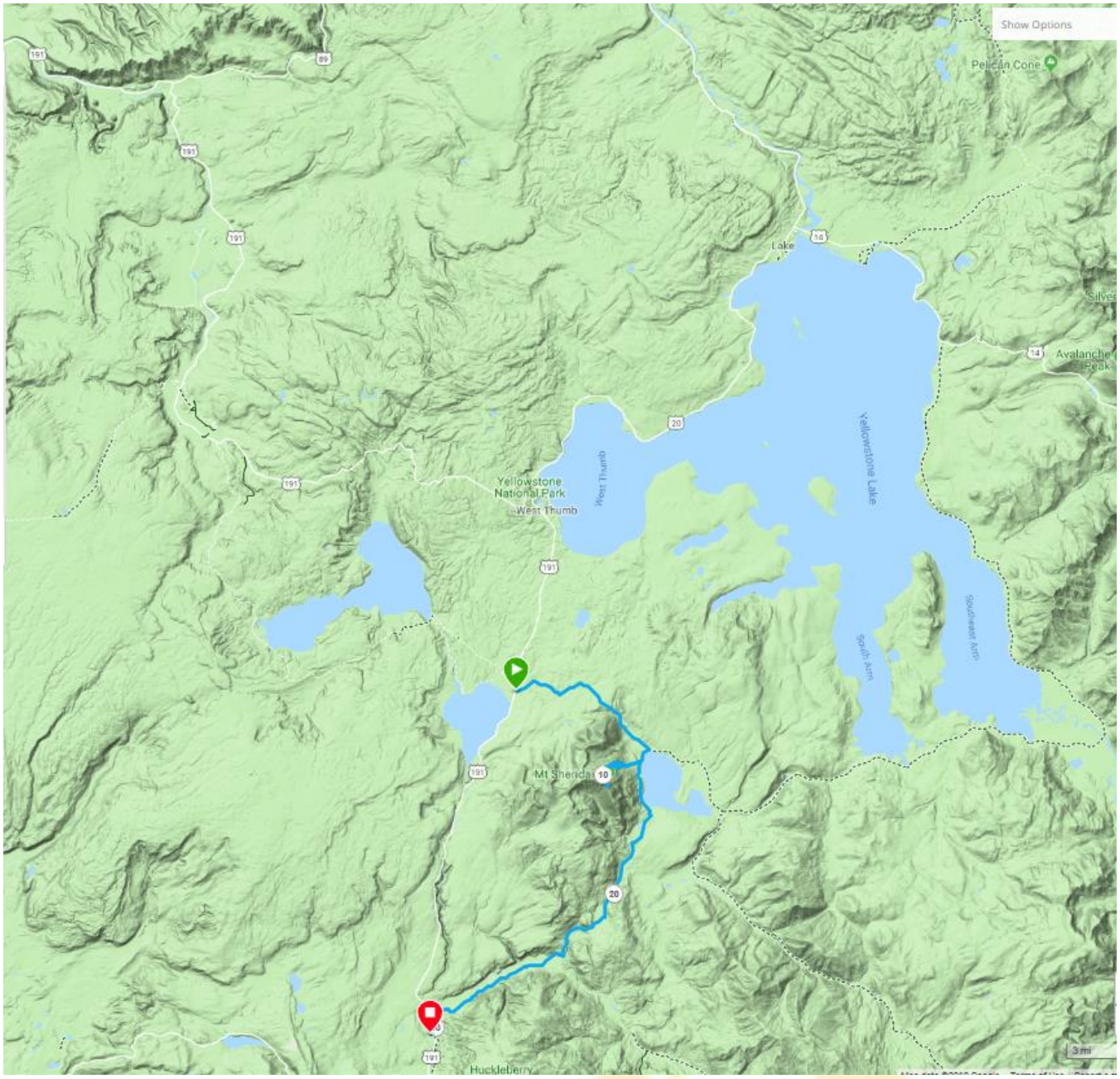
YELLOWSTONE ITENERARY FOR 10/2019						
Date	**Day/Activity**	**Night/Camp**	**Distance**	**Positive Gain**	**Negative Gain**	**Overall Gain**
10/21/2019	Fly in to Bozeman, MT. Supply Run	Madison Hotel in West Yellowstone				
10/22/2019	Begin Hike at Heart Lake Trailhead and hike to 8H4	Heart Lake West Shore 8H4 Campsite	7.65 mi.	433 ft.	-711 ft.	-278 ft.
10/23/2019	Summit Mt. Sheridan	Heart Lake West Shore 8H4 Campsite	6.63 mi.	2952 ft.	-2952 ft.	0 ft.
10/24/2019	Hike to Snake River	Snake River Hot Springs 8C1 Campsite	10.94 mi.	607 ft.	-1172 ft.	-565 ft.
10/25/2019	Hike out to South Park Entrance	Madison Hotel	5.41 mi.	112 ft.	-195 ft.	-83 ft.
10/26/2019	Tour Park then Drive to Bozeman	Hotel in Bozeman				
10/27/2019	Fly home					
		Totals	**30.93 mi.**	**4104** ft.	**-5030 ft.**	**-926 ft.**

Topographical Map of the Northern Traverse



Satellite Map of the Northern Traverse



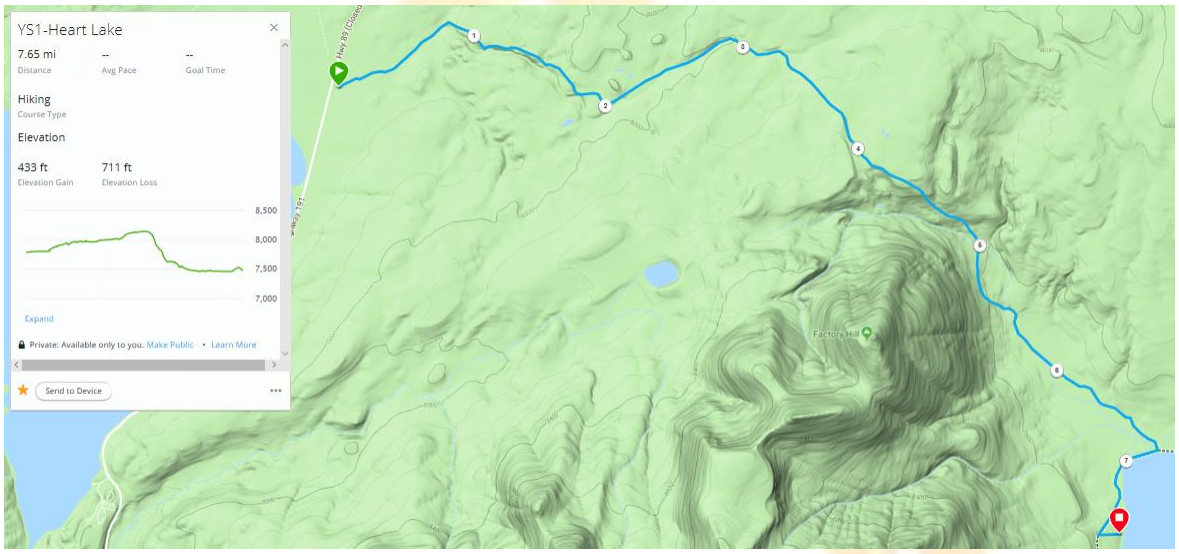

Show Options
Pelican Cone
Lake
Yellowstone Lake
West Thumb
Yellowstone National Park
West Thumb
South Arm
Southeast Arm
Mt Sheridan
Huckleberry
3 mi

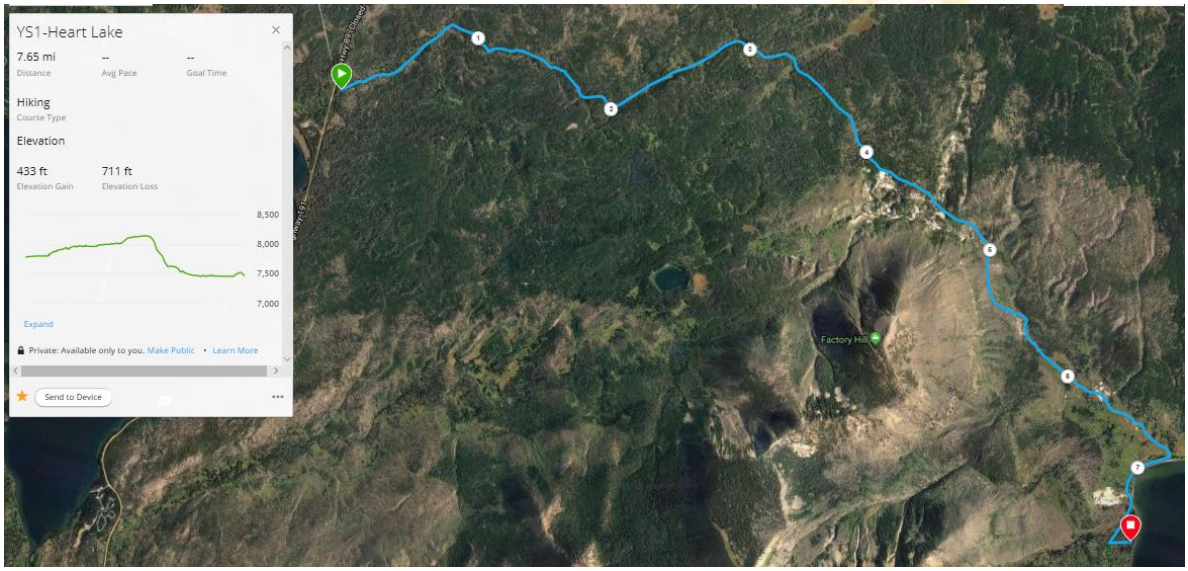
Trekking Routes

Day 1

Hiking from Heart Lake Trailhead to the base of Mt. Sheridan on the west shore of Heart Lake (10.84 miles).

Beginning from the Heart Lake Trailhead we'll enter a burn area from the 1988 fires. Now over a quarter century old, the cleansing, regenerative effects of the fire are clearly evident. Factory Hill (9,607') dominates the southern view as we ascend a gentle plateau overlooking Witch Creek and Heart Lake. A number of hot springs pour into the creek, raising its temperature to nearly 200-degrees Fahrenheit! The trail follows Witch Creek through another burn area and then enters a meadow before joining Heart Lake. The largest trout ever caught in Yellowstone (a 43-lb. lake trout) was caught here. Along the lake's western shore is Rustic Geyser, which is occasionally active.





Day 2

Hiking to the Summit of Mt. Sheridan and back to camp (6.63 miles)

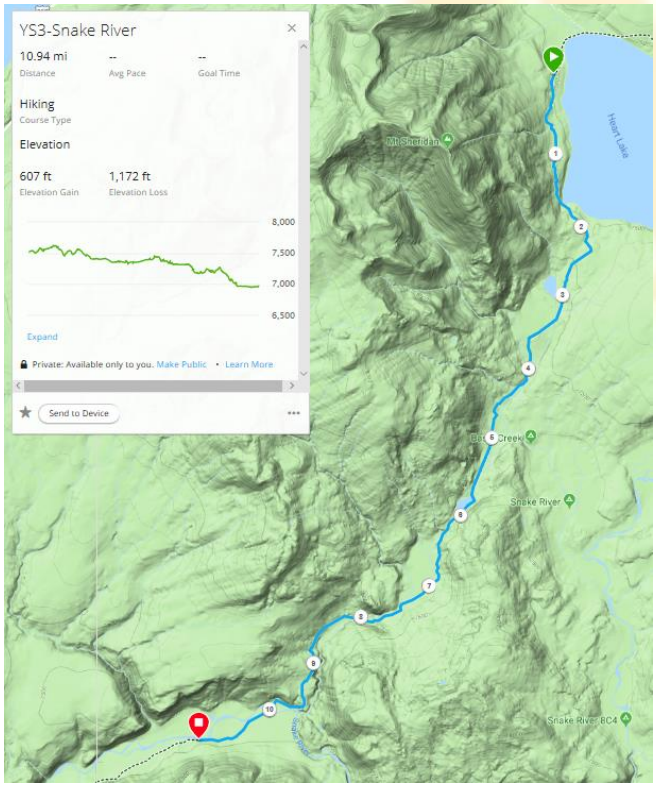
The second day will be spent hiking to the summit of Mount Sheridan. Mount Sheridan was named in 1871 by Captain Barlow after General Philip H. Sheridan, a distinguished soldier who often visited the park and worked in its interest. At 10,308 feet the peak lies a whopping 2,858 feet above Heart Lake. The trail winds its way through meadows and forests up the northwestern shoulder of the mountain. Once atop the peak there are spectacular 360º views of the Grand Teton, Lewis Lake, the Absaroka Mountains, and Yellowstone Lake. Also atop the summit is a fire-lookout - hard to imagine living up here through the summer thunderstorms!

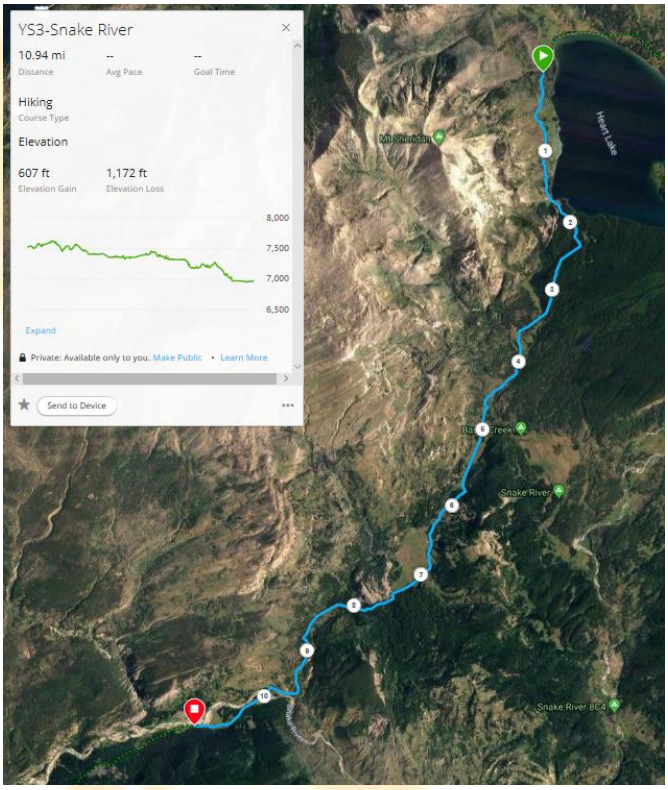
Day 3

Hiking from Heart Lake to the Snake River Campground on the banks of the Snake River (10.94 miles)

Following a hearty breakfast we'll proceed south along Heart Lake's western shore through open country where wildflowers abound. Hiking directly beneath Mount Sheridan we'll see a number of characteristic avalanche chutes that exhibit precisely where massive avalanches have swept down on the lake. It is no wonder forests struggle to take hold here.

Once south of the lake we'll hike through thick forest to the open and marshy glen that holds Sheridan Lake. After passing another lake (the picturesque Basin Creek Lake) we'll descend to our camp on the Snake River near a number of thermal springs. One of these springs flows with a surprisingly high volume and contains beautiful blue algae accustomed to extreme temperature. The spring continues for approximately 1/4 mile before flowing into the Snake River - a fantastic spot for soaking. Those who wish may take advantage of soaking in the springs with a spectacular view of the surrounding canyon.

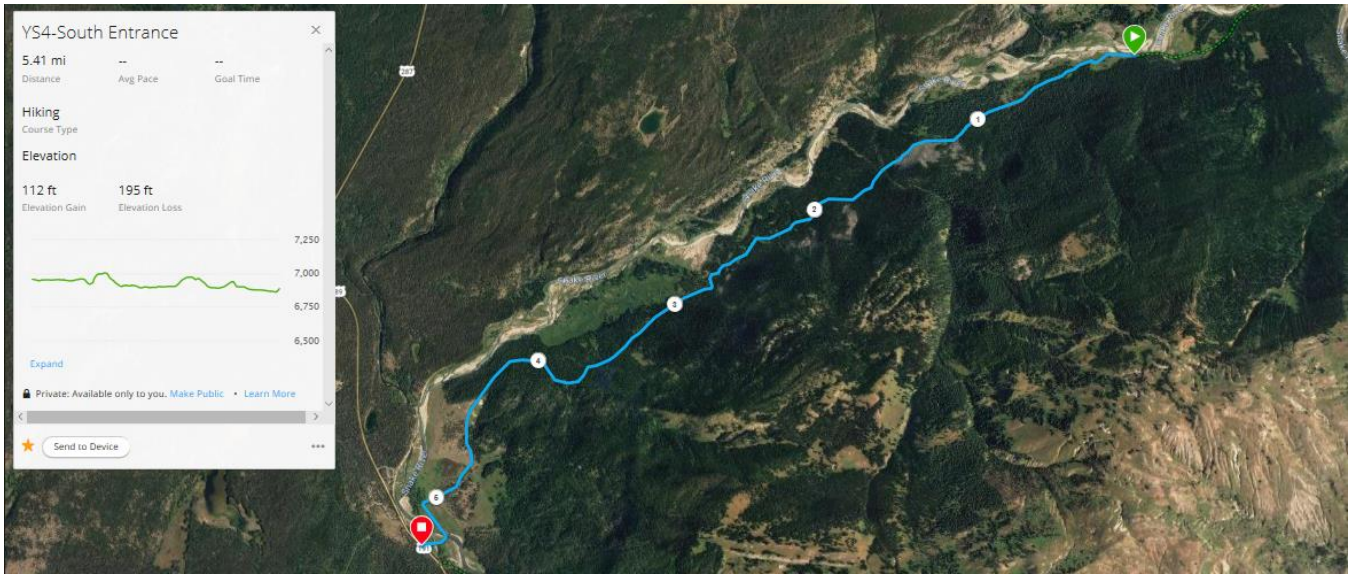




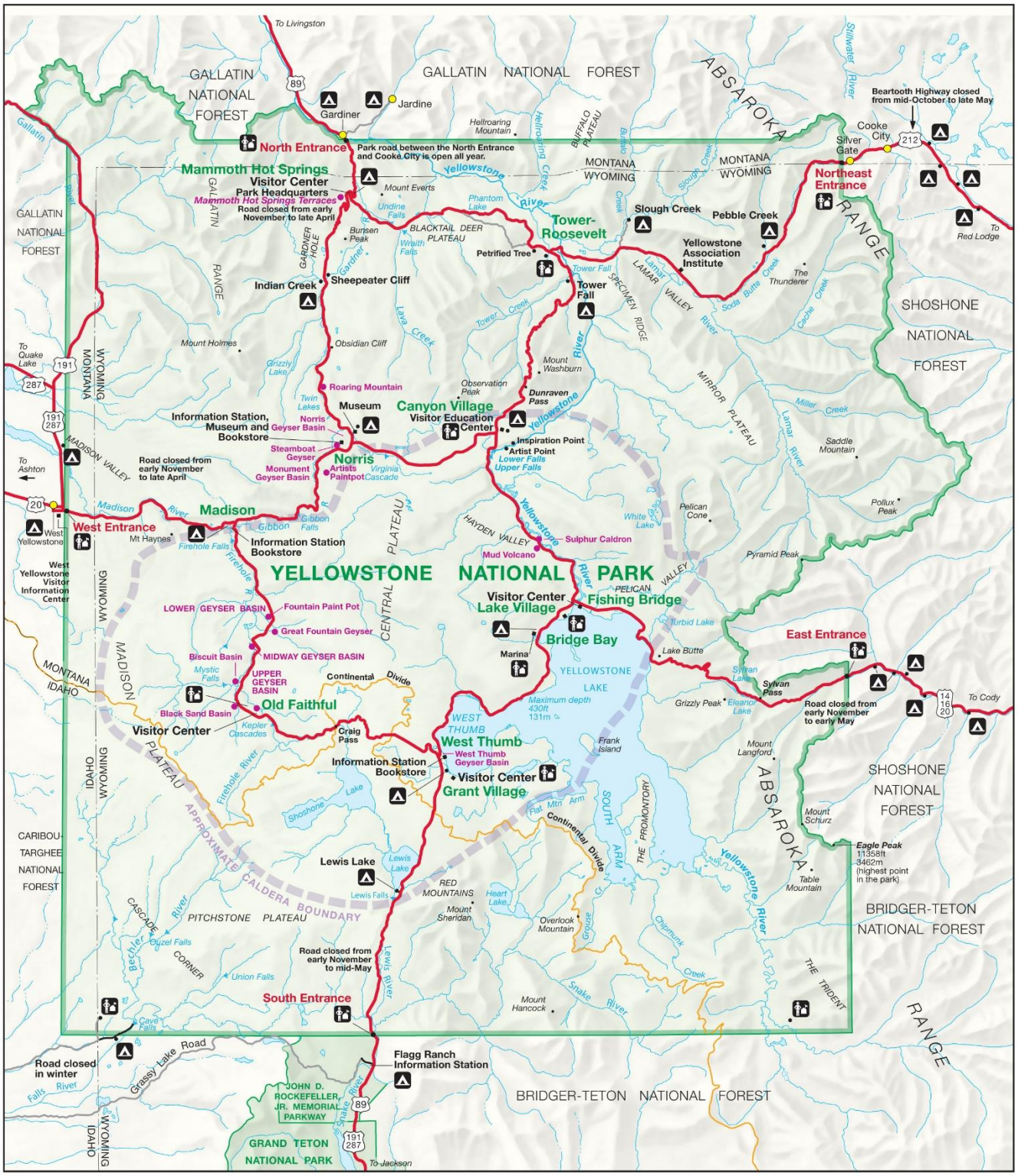
Day 4

Hiking along the Snake River to Yellowstone South Gate Entrance (5.41 miles)

The final day we'll hike out along the Snake River to the South Entrance. It is a beautiful 5.5-mile hike through stands of lodgepole pine, spruce, and fir with potential wildlife viewing.



Topography & Maps


To Livingston
GALLATIN NATIONAL FOREST
GALLATIN NATIONAL FOREST
ABSAROKA
Gardiner
Jardine
North Entrance
Park road between the North Entrance and Cooke City is open all year.
Mammoth Hot Springs
Visitor Center
Park Headquarters
Mammoth Hot Springs Terraces
Road closed from early November to late April
Mount Everts
Hellroaring Mountain
BUFFALO PLATEAU
MONTANA
WYOMING
Yellowstone River
Phantom Lake
Undine Falls
Bunsen Peak
BLACKTAIL DEER PLATEAU
Wraith Falls
Tower-Roosevelt
Petrified Tree
Slough Creek
Pebble Creek
Yellowstone Association Institute
Beartooth Highway closed from mid-October to late May
Silver Gate
Cooke City
Northeast Entrance
To Red Lodge
Stillwater River
The Thunderer
Indian Creek
Sheepeater Cliff
Tower Fall
Tower Creek
Lava Creek
Obsidian Cliff
Mount Holmes
Grizzly Lake
To Quake Lake
Roaring Mountain
Twin Lakes
Museum
Canyon Village
Visitor Education Center
Observation Peak
Dunraven Pass
Mount Washburn
Information Station, Museum and Bookstore
Norris Geyser Basin
Steamboat Geyser
Monument Geyser Basin
Norris
Artists Paintpot
Virginia Cascade
Road closed from early November to late April
Inspiration Point
Artist Point
Lower Falls
Upper Falls
SHOSHONE NATIONAL FOREST
MIRROR PLATEAU
Miller Creek
Saddle Mountain
Pollux Peak
Pelican Cone
To Ashton
Madison
Madison River
West Entrance
West Yellowstone
Mt Haynes
Firehole Falls
Gibbon Falls
Information Station Bookstore
West Yellowstone Visitor Information Center
MADISON VALLEY
HAYDEN VALLEY
Sulphur Caldron
Mud Volcano
White Lake
Pyramid Peak
YELLOWSTONE NATIONAL PARK
CENTRAL PLATEAU
LOWER GEYSER BASIN
Fountain Paint Pot
Great Fountain Geyser
Visitor Center
Lake Village
Fishing Bridge
PELICAN VALLEY
Turbid Lake
Bridge Bay
Marina
East Entrance
Lake Butte
Biscuit Basin
MIDWAY GEYSER BASIN
Mystic Falls
UPPER GEYSER BASIN
Continental Divide
Old Faithful
Black Sand Basin
Kepler Cascades
Visitor Center
YELLOWSTONE LAKE
Maximum depth 430ft 131m
Sylvan Lake
Sylvan Pass
Grizzly Peak
Eleanor Lake
Road closed from early November to early May
To Cody
Craig Pass
WEST THUMB
West Thumb
West Thumb Geyser Basin
Information Station Bookstore
Visitor Center
Grant Village
Frank Island
Mount Langford
SHOSHONE NATIONAL FOREST
ABSAROKA
Mount Schurz
Eagle Peak 11358ft 3462m (highest point in the park)
Table Mountain
BRIDGER-TETON NATIONAL FOREST
THE PROMONTORY
SOUTH ARM
Flat Mtn Arm
Lewis Lake
Lewis Falls
RED MOUNTAINS
Mount Sheridan
Heart Lake
Overlook Mountain
APPROXIMATE CALDERA BOUNDARY
PITCHSTONE PLATEAU
CARIBOU-TARGHEE NATIONAL FOREST
Cascade Falls
Union Falls
Road closed from early November to mid-May
South Entrance
Mount Hancock
Snake River
THE TRIDENT
Cave Falls
Road closed in winter
Grassy Lake Road
Flagg Ranch Information Station
JOHN D. ROCKEFELLER, JR. MEMORIAL PARKWAY
GRAND TETON NATIONAL PARK
To Jackson
BRIDGER-TETON NATIONAL FOREST
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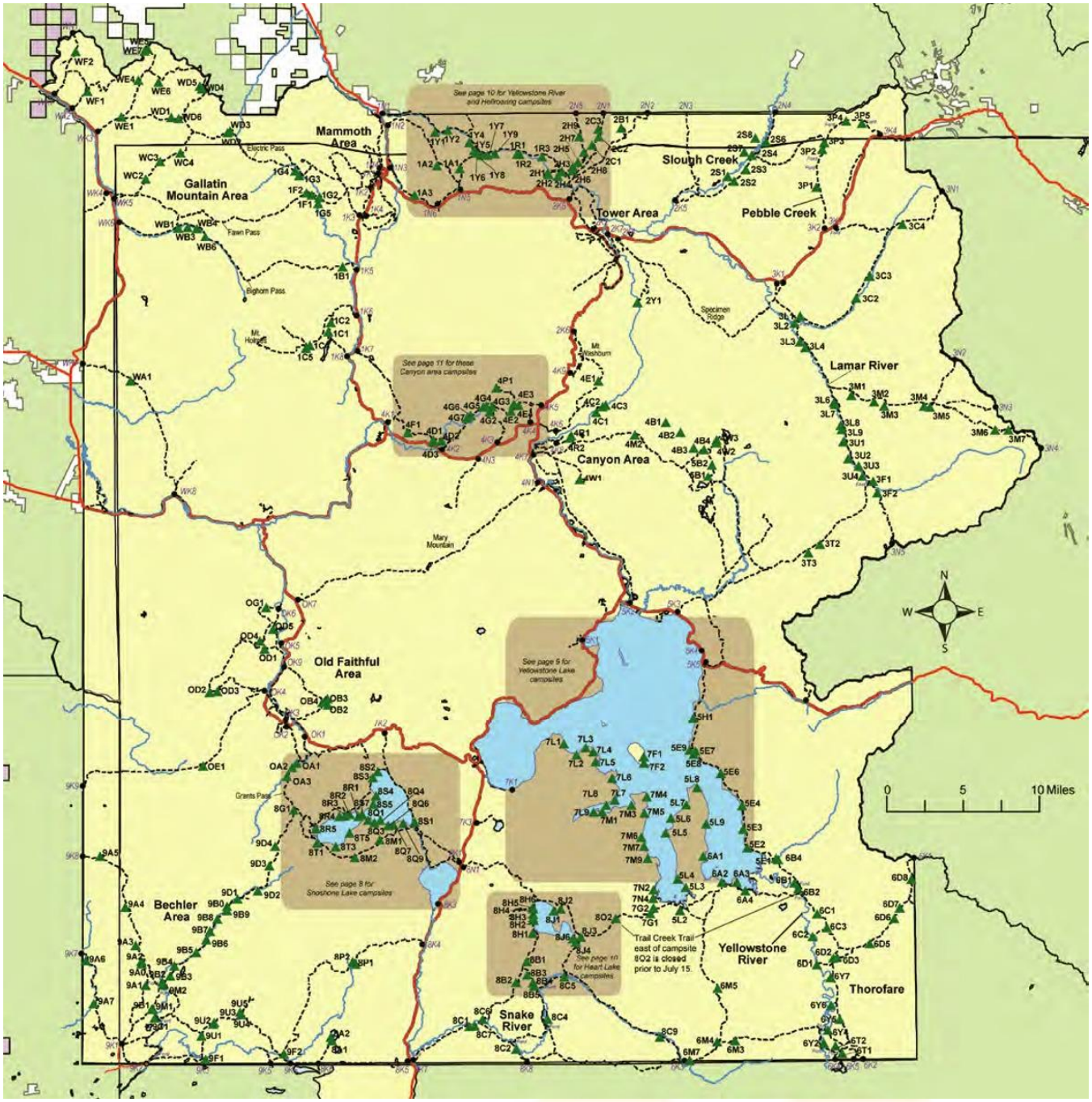
Mammoth Area
Gallatin Mountain Area
Slough Creek
Tower Area
Pebble Creek
Lamar River
Canyon Area
Old Faithful Area
Bechler Area
Snake River
Yellowstone River
Thorofare
Trail Creek Trail east of campsite 8O2 is closed prior to July 15.
0 5 10 Miles
N
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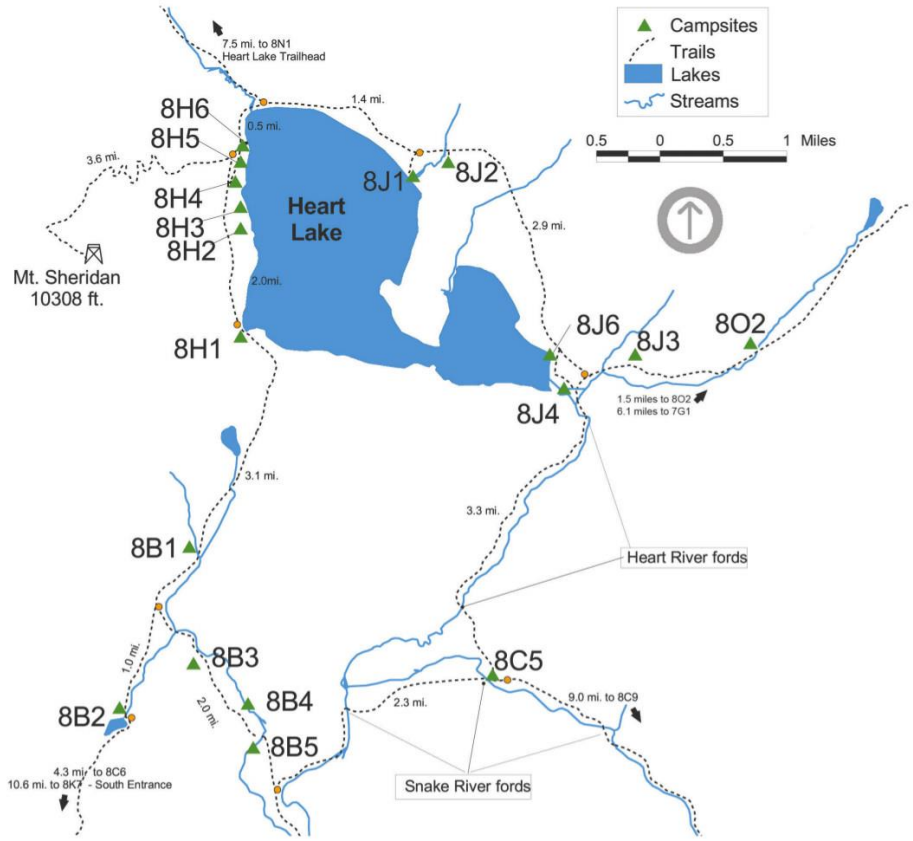
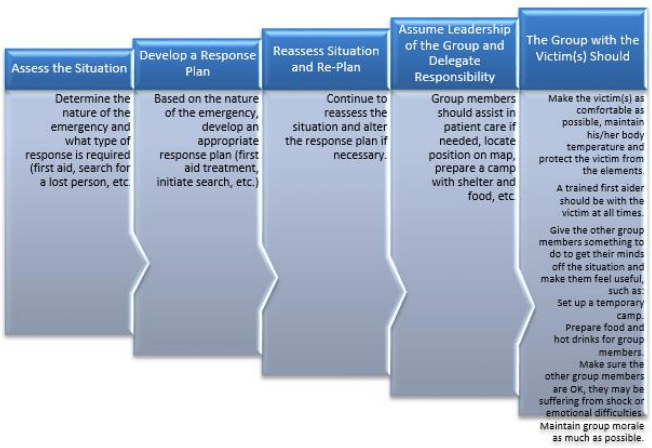


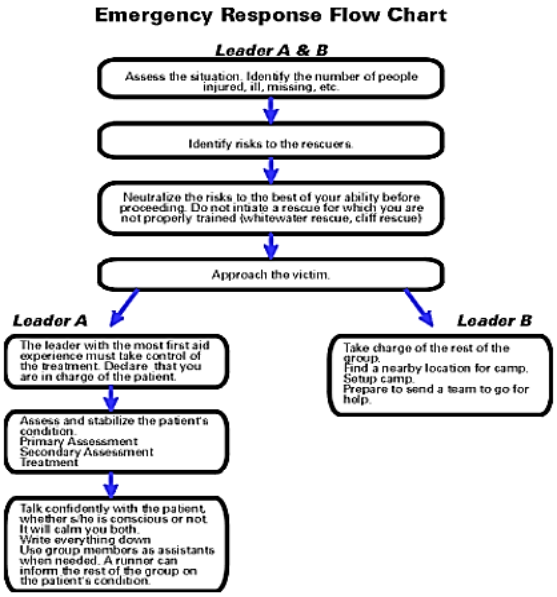
Site	Capacity	Stock	Campsite name/restrictions
All sites listed below are closed 4/1–6/30. (Heart Lake Bear Management Area - O)			
8B1	4	0	Basin Creek
8B2	12	6	Basin Creek Lake
8B3	12	20	Basin Creek • Stock Parties Only • Unavailable if 8B4 occupied
8B4	12	20	Basin Creek • Stock Parties Only • Unavailable if 8B3 occupied
8B5	8	0	Basin Creek
8C5	12	10	Snake River
8H1*	8	0	South Bay • NWF
8H2*	6	0	Sheridan Creek
8H3*	4	0	Hideaway

Site	Capacity	Stock	Campsite name/restrictions
8H4*	8	0	West Shore • NWF
8H5*	6	0	Sheridan Trail • NWF
8H6*	6	0	Rustic • NWF
8J1*	8	0	Beaver Creek
* All 8H sites and 8J1 have a limit of 2 nights per trip from 7/1 to 9/1			
8J2	12	25	Beaver Creek Meadow • Stock Parties Only • 2 night limit
8J3	8	0	Surprise Creek
8J4	8	0	Heart River
8J6	4	0	E Shore
8O2	6	0	Outlet Creek • No travel east of Outlet Lk. before 7/15
NWF = No Wood Fires			

Emergency Action Plan (EAP)

Since each situation is unique, trip leaders must remain flexible in their response. The key to properly responding to an emergency is to remain calm, assess things carefully before acting, and continue to reassess your strategy throughout. There are two basic things to be done, care for the victim and care for the rest of the group. The more severe the situation, the more both populations will need your care and support. A basic approach to handling emergency situations is shown in flowchart form in the figure below.





Evacuation Procedures

When to Evacuate

Evacuation is used as a general term for transporting someone from a trip. In most cases we think of this as caused by a medical problem. It can also be the result of psychological problems, a family emergency, or the assessment of the trip leaders that the person's behavior poses a threat to themselves or others in the group. Specific evacuation protocols for first aid situations will be determined by the group leaders.

If someone needs to be evacuated due to injury or illness, the primary concern is for the safety and health of the patient. When assessing the need for an evacuation, think both about the patient's condition and how rapidly medical attention is needed. For example, it may take 2 hours for the patient to walk out on their own. Whereas to send two people out for help (2 hours), get a rescue squad to the trailhead (1 hour), hike back in (2 hours - unless driving in is possible), and hike back out (2 hours+) will mean over 7 hours before the patient is evacuated. Their injury may need treatment sooner than that. You also consider your resources, do you have the necessary equipment, manpower, and experience to safely evacuate the person given the current trail and weather conditions. If you do evacuate the person, take the time to plan out the best route keeping in mind patient condition, distance, terrain, etc. Depending on the situation, you might chose the shortest route, the quickest route, or a longer route that poses less threat to the patient's condition. Use the evacuation flow chart to determine how to deal with an evacuation situation.

Possible Evacuation Scenarios

Person Can Walk Out On Own Power	Person Can Walk Out with Assisstance	Person Cannot Walk Out
• The person's medical condition would not be compromised by walking out. This may necessitate taking all the person's equipment. Ex. Stomach ailment, mild allergic reaction, minor laceration.	• If the distance is not too great, the person may be able to hike out if carrying no weight and with assistance. This is to be attempted only as long as it does not aggravate the individual's condition. The person must be constantly monitored.	•The injury/illness would be aggravated by walking out or movement is contraindicated. Do not attempt a litter evacuation unless you have the necessary equipment, experience, and manpower, otherwise you risk additional injury to your patient as well as placing other members of the group at risk (see Dynamics of Accidents Model page 00). In this case a litter evacuation by skilled rescue personnel (rangers, first aid squad, etc.) is required. Send for help

Choosing to Evacuate

If you have determined that it is medically appropriate to evacuate your patient, you need to determine whether or not you have the skills, the time and the manpower to perform the evacuation safely. Ask yourself these questions.

_____ How much daylight do you have?

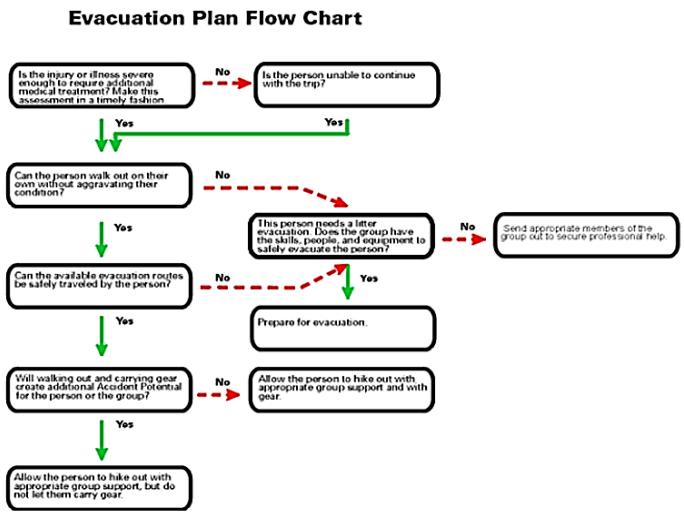
_____ What is the weather? Is it changing? For the worse?

_____ Can you continue to provide the necessary first aid treatment and monitoring during the evacuation?

_____ What if your patient's condition deteriorates? Would it be more difficult to treat him/her once you start hiking out?

_____ How many people do you have to do the evacuation? For a litter evacuation you should plan to have a minimum of 3 teams of 6-8 people rotating through the litter carry.

Evacuation Flow Chart



Emergency Call – Ins

In the event of an emergency one of the most important components is how you handle the incoming call. You need to gather sufficient information to determine the nature of the problem and to select the most appropriate responses.

In order to categorize the nature of the response we use an adaptation of the International Scale of River Difficulty which is used to rate whitewater rivers on a scale from Class I to Class V. As you will see below, we use this scale to establish responses levels for Evacuation, Medical Response, and Notification.

Identify caller

Identify exact location and phone number. Can you call back? If not determine a time or plan for the caller to contact you again.

Interview caller to determine problem

Leaders may underestimate the nature of the problem so a conservative medical response is the best course of action.

Triage problem

Class I - minor medical problem. Person can remain on the trip.

Class II - minor medical problem. Person must be treated or evaluated at medical facility. Discharge and return to trip likely. Anything

above Class II requires a call to McCosh Health Center.

Class III - moderate medical problem. Person must be treated or evaluated at medical facility. Discharge and return to trip uncertain.

Class IV - serious medical problem. Person must be treated or evaluated at medical facility. Discharge and return to trip unlikely.

Determine appropriate evacuation response

Class I - hikes out on own power
How long will this take?
What if it takes longer?
What if patient's condition deteriorates?

Class II - hikes out with assistance
How long will this take?
What if it takes longer?
What if patient's condition deteriorates?

Class III - needs to be picked up by vehicle
How long will this take?
What if it takes longer?
What if patient's condition deteriorates?

Class IV - needs litter evacuation
How long will this take?
What if it takes longer?
What if patient's condition deteriorates?

Class V - needs helicopter airlift
How long will this take?
What if it takes longer?
What if patient's condition deteriorates?

Determine appropriate professional medical response

Class I - person seen on return to campus

Class II - leaders or support drives person to hospital

Class III - EMS meets groups at trailhead

•

Class IV - EMS sent in to group

Class V - Advanced Rescue Team or helicopter required

Notifications (each higher level is cumulative of the levels beneath)

Family members

Follow-up

How is the group doing? Do they need to be evacuated for emotional support?

Will the group need follow-up support and/or counseling upon return to campus?

Will the leaders need follow-up support and/or counseling upon return to campus?

Triage

The purpose of Triage is to determine the nature and extent of injury or illness. In the case of multiple victims, it is used to prioritize treatment. As you take an emergency phone call, you need to gather information to do your own triage of the situation.

1. Get full SOAP Note from Leader
   - History
   - Vitals
   - Problem list
   - Anticipated Problem list
2. Determine exact location of the group.
   - Where was the group when the messengers left?
   - How far are they from the trailhead?
   - What other options are there for reaching the patient? What is the group doing (staying put or hiking out?)
   - How will the time lengths of different evacuation modes affect the medical condition/treatment?
3. Contact outside experts as needed to develop emergency response plan
   - Based on problem as defined in #1 and #2 determine the "need for speed."
   - Implement the appropriate professional medical response as indicated above

Communications and Navigation

Recommended Communication Equipment

Motorola T600 H20 2-Way Radio

Group will be equipped with two way radios for communications and emergency procedures. Range of up to 35 miles (may vary depending on terrain and conditions); compatible with any radio regardless of brand.

Motorola T600 H20 2-way radios will keep you in contact with your adventure partners on land or water, thanks to a 35-mile range and a floating, waterproof design and LEDs that light up in water.An emergency alert button transmits an alert siren followed by spoken or incidental sounds to warn others of your peril, and has a built-in LED flashlight for emergencies.

Push-To-Talk (PTT) power boost allows you to extend the transmission range by increasing the transmitter power output.

Hands-free communication is provided by iVOX/VOX, which acts like a speakerphone to keep your hands free as you hike

Emergency Frequency:	
Ranger Frequency:	

Recommended Tracking & Emergency Signal Devices

Garmin Rino 755t

We will have one Rino device for navigation, gps tracking and emergency communications. High-sensitivity GPS with GLONASS satellite reception tracks satellites in more challenging environments than GPS alone.

Powerful, 5 watt FRS/GMRS 2-way radio lets you communicate by voice call or unit-to-unit text messaging. 3 in. color touch-screen with dual orientation and sunlight-readable display.

Bluetooth® connectivity supports a wireless headset (not included) for improved voice communication. 3-axis compass with accelerometer and barometric altimeter sensors.

NOAA weather radio, Active Weather forecasts and animated weather tracking help you stay one step ahead of changing conditions.

Geocaching Live connects with with Geocaching.com to download the caches you want while you're on the go.

Position Reporting shows you the location of other Rino users on the same channel and lets you alert them if you need help.

Garmin inReach Mini

inReach Mini is your go-to connection for maintaining off-the-grid contact. It's our palm-sized satellite communicator for adventures where size and weight matter. inReach Mini lets you send and receive text messages, track and share your journey and, if necessary, trigger an SOS alert to contact the GEOS 24/7 emergency response team. With inReach connectivity, your family and friends will know they can stay in touch globally.

- Small, rugged, lightweight satellite communicator enables two-way text messaging using the 100% global Iridium network (satellite subscription required)
- Trigger an interactive SOS to the 24/7 search and rescue monitoring center (satellite subscription required)
- Access downloadable maps, U.S. NOAA charts, color aerial imagery and more by using the free Garmin Earthmate app and compatible devices
- Optional inReach weather forecast service provides detailed updates directly to your inReach Mini or paired device; basic and premium weather packages available
- Send and receive inReach messages through compatible Garmin devices, including connected wearables and handhelds

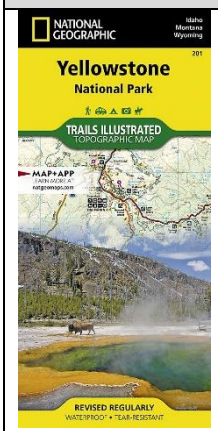
Garmin Link for Tracking:	

Note: AcadianX Guides are equipped with all mentioned gear.

Recommended Navigation Tools

Topographic Trail Map

National Geographic Trails Illustrated Topo Map



Learning how to navigate with a paper map is an essential skill. A topographic map is designed to show the physical features and terrain of an area, which is what makes them ideal for backpackers. They're different from other maps because they show the three-dimensional landscape: its contours, elevations, topographic features, bodies of water, and vegetation. Simplified trail maps—like the JPEG images you might find on a national park's website— don't include all the information you need in order to navigate. No elevation data, no magnetic declination, and much fewer symbols. If you get lost, these trail maps won't help you find your way out. A topographic map offers a wealth of orienteering information—not just elevation and distance, but changes in vegetation and even human-made structures. It's enough to plan an entire trip in advance or to find your way in a pinch.

Handheld Navigation Device

Garmin Rino 755t

Whether you're hunting, hiking, climbing or paddling, the rugged Rino 700 navigator is your go-to for any adventure. Offering an affordable entry point to our navigator/communicator lineup, it retains the core functionality of our more feature-rich Rino 750 and 755t handhelds. And its powerful two-way radio is fully compatible with them as well. So, it's easy to stay in touch with other Rino-carrying members of your group.

- 5 W GMRS two-way radio offers extended range, up to 20 miles; communicate by voice or unit-to-unit text messaging
- High-sensitivity GPS and GLONASS satellite reception; tracks in more challenging environments than GPS alone
- Rechargeable internal lithium-ion battery can provide up to 13 hours of battery life
- Position reporting feature shows locations of other Rino users on the same channel
- Worldwide basemap shows position and supports basic navigation

Navigation Enabled Watch

Garmin Fenix

- Ultimate multisport GPS watch with full-color TOPO U.S. mapping, routable cycling maps and other outdoor navigation features
- Fit for adventure with rugged design that features stainless steel bezel, buttons and rear case: Physical size 5.1 x 5.1 x 1.8 cm;Weight - silicone band: 98 g ; metal band: 196 g
- Built-in navigation sensors include GPS and GLONASS capability to track in more challenging environments than GPS alone as well as 3-axis compass, gyroscope and barometric altimeter
- Preloaded run profiles: running, treadmill running, trail running. Put key stats at your fingertips with the performance widget that shows your training status, training load and more
- Provides built-in mapping and navigation features to help keep you oriented and on course. Full-color TOPO mapping comes preloaded with map data optimized for at-a-glance navigation and location tracking.
- Features multinetwork (GPS, GLONASS and Galileo) satellite reception to track in more challenging environments than GPS alone. In addition to map-based guidance, each watch also provides a set of ABC (altimeter, barometer and compass) sensors for outdoor navigation. The built-in altimeter provides elevation data to accurately monitor ascent and descent for activities such as hiking, while the tilt-compensated three-axis electronic compass keeps your bearing — whether you're moving or not.

Note: AcadianX Guides are equipped with all mentioned gear.

Clothing Essentials

Layering Basics

When you step outdoors, the ancient art of layering becomes your smart-technology thermostat. This tried-and-true strategy lets you regulate comfort by slipping layers on and off as your activity level or the weather changes.

How to layer: To understand layering your clothing for outdoor activities, you need to know the function of each layer:

1. **Base layer** (underwear layer): wicks sweat off your skin
2. **Middle layer** (insulating layer): retains body heat to protect you from the cold
3. **Outer layer** (shell layer): shields you from wind and rain

Even if you don't wear all three layers at the outset, it's a good idea to take all layers on every outing: You can peel off layers if things heat up, but you can't put on layers that you didn't bring along.

Cold, Rainy and Hot Layering Examples

We're often asked about how to layer for certain weather. Any suggestions based solely on weather, though, overlook key considerations, like exertion level and personal metabolism. The examples below are for a hypothetical person who doesn't run particularly hot or cold, who is going on an intermediate-level half-day hike:

Cold-weather layers:

Midweight polyester long underwear top and bottom; a jacket with synthetic insulation; midweight fleece pants; waterproof/breathable rain jacket and pants.

Rainy-weather layers (cool temps):

Lightweight polyester long underwear top and bottom; lightweight fleece jacket; synthetic hiking pants; lightweight waterproof/breathable rain jacket and pants (with plenty of vents).

Hot-weather layers:

Polyester briefs and a short-sleeve synthetic Tee; convertible nylon hiking pants; lightweight wind jacket.

You have literally dozens of alternatives and options for each of these layers. The trick is to go with options that make the most sense for where you're headed, what you're doing and what you're able to spend.

It's also key that you take the time to adjust layers as conditions change. If the rain and wind let up, remove your shell. If hiking alone isn't warming you up, add a middle layer. And many people add a middle layer (on top) and/or outer layer at every rest stop, just to avoid getting chilled.

Base Layer: Moisture Management

As the next-to-skin layer, a base layer's job is moving perspiration away from your skin, aka "wicking." In cool or cold conditions, wicking long-underwear-style base layers are needed to keep your skin dry. That's essential because it helps to keep you from becoming chilled or worse—hypothermic.

Base layer materials: You have a wide range of fabric options, including synthetics like polyester and nylon, or natural fibers like merino wool and silk. Though there are subtle differences in wicking and drying for each material, and in odor retention and durability, a lot people simply go with their personal fabric preference.

Base layer weights: Your options are straightforward—lightweight, midweight and heavyweight—though you might also see terms like "ultralightweight" on one end of the spectrum or "expedition weight" at the other. Generally, heavier (thicker) fabrics keep you warmer, though that's not really the primary purpose of a base layer (wicking is).

Warm-weather base layers: Long underwear might not be appealing when temperatures soar, but having dry skin generally makes you more comfortable in all conditions. (No one likes having clammy, drippy skin.) Here are some other warm-weather base-layer considerations:

- Any summer shirt is really a base layer, so look for ones that offer wicking.
- Some shirts designed for warm weather spread the moisture out through the fabric, where evaporation helps with cooling. They won't really be marketed as a base layer, but as your next-to-skin layer they can increase your comfort in hot conditions.
- Underwear like briefs, boxers and bras should also wick (the same is true when you wear it under your long underwear in winter).
- UPF-rated base layers give you added sun protection.
- Cotton, considered a no-no in winter because it sponges up water and can chill you, can be okay if you're outside on a super-dry, scorching summer day.
- Emerging fabric technologies, like wool infused with ceramic particles, will offer base layers that literally cool your skin for greater comfort.

Middle Layer: Insulation

The insulating layer helps you retain the heat that's radiated by your body. The more efficiently this layer traps that heat, the warmer you'll be.

Middle layer materials: Just as with base layers, you have a broad range of options, both synthetic and natural. In general, thicker (or puffier) equals warmer, though the efficiency of the insulating material is also important. Below are some common middle layer materials, though other options, like wool and wool-blend tops, are also available.

Here are some of your primary choices for middle layers:

Polyester fleece: Available in lightweight, mid-weight and heavyweight fabrics (sometimes marketed as 100, 200 and 300 weight), fleece stays warm even if gets damp, and it dries fast. Fleece also breathes well, so you're less likely to overheat in it.

The flipside of breathability, though, is that wind blows right through, which can steal warmth. That's why you need to have a shell layer with you if you're going with a fleece middle layer. (Another option is to wear wind fleece, which includes an inner wind-blocking membrane.)

Down insulated jackets: Highly compressible for easy packing, down offers more warmth for its weight than any other insulating material. The efficiency of down is measured in fill power—from 450 to 900. Because down is always inside a shell material, down jackets also offer some water and wind resistance. The drawback to down is that it loses insulating efficiency when damp.

Synthetic insulated jackets: Synthetic insulations have long tried to mimic down's efficiency, coming closer to that standard every year. And, while synthetics don't compress as well as down, they're a popular option for rainy conditions because they retain insulating ability when they get damp. And, like down, synthetic insulation is always inside a shell material that offers added water- and wind resistance.

Outer Layer: Rain and Wind Protection (Shell)

The outer layer (or shell layer) protects you from wind, rain and snow. Shells range from pricey mountaineering jackets to simple wind-resistant jackets. Most allow at least some perspiration to escape; virtually all are treated with a durable water repellent (DWR) finish to make water bead up and roll off the fabric.

Your outer shell is an important piece in stormy weather, because if wind and water are allowed to penetrate to inner layers, you can get seriously chilled.

Shells can be lumped into the following categories:

Waterproof/breathable shells: Your most functional (and expensive) choice, this type of shell is your best option for full-on squall conditions. Generally, pricier equals drier, though higher priced shells are often more durable as well.

Water-resistant/breathable shells: These are more suited to drizzly, breezy conditions and high activity levels. More affordable than waterproof/breathable shells, they're typically made of tightly woven nylon or polyester fabrics that block light wind and light rain.

Soft shells: These emphasize breathability. Most feature stretch fabric or fabric panels for added comfort during aerobic activities. Many combine light rain and wind protection with light insulation, so they in effect combine two layers into a single jacket.

Waterproof/nonbreathable shells: These bare-bones shells are okay for rainy days with light to no activity (e.g., fishing, spectating). They are typically made of a coated nylon, which is water- and windproof. If you exert yourself while wearing one, you'll probably end up saturating your underneath layers with perspiration.

Recommended Clothing Brands and Considerations

Clothing Type	Style	Brands	Notes
Hiking Shoe/Boot		**Salomon** **Merrel** **Obre**	Some people like to wear a pair of light trail running shoes instead of boots. Most prefer boots in order to keep ankle stable. Feet will get wet so Gor-tex lined are recommended.
Base Layers	*Torso*	**Tesla** **Under Armor**	Must wick away moisture.
	Legs	**Tesla** **Under Armor**	Must wick away moisture.
Middle Layer	*Torso*	**Mountain Hardware** **REI Co-Op**	Insulation layer for thermal protection.
	Legs	**Under Armor**	Insulation layer for thermal protection.
Outer Layer	*Torso*	**Kuhl** **Outdoor Research** **Mountain Hardware**	Should be durable, moisture resistant, quick drying and light weight.
	Legs	**Kuhl** **Outdoor Research**	Should be durable, moisture resistant, quick drying and light weight.
Briefs/Boxers		**Exoficcio** **Saxx**	Needs to be synthetic, anti-microbial, breathable, and moisture wicking. At least 3 pairs.
Socks		**Smart Wool** **Darn Tough**	Good hiking socks are a must. We recommend either Darn Tough" or "Smart Wool". You will need at least 3 pairs.
Head Gear	*Beanie*	**Smartwool** **Outdoor Research**	Should be snug on your head and keep you warm.

	Neck Gaiter/ Cravat	**Buff**	Most versatile piece of clothing you will have. A must on the trail.
Gloves	***Hiking***		Gloves - a good pair of biking gloves will help prevent blisters when using trekking poles.
	Thermal	**Outdoor Research** **Black Diamond** **Manzella** **Sealskinz**	Waterproof is preferable. Need to keep you warm even when wet outside.
Rain Shell		**REI Co-Op** **Arc'teryx** **Outdoor Research**	The rain shell needs to breathe properly allowing heat to escape. If not you will become overheated when hiking.

Recommended Clothing Retailers and Websites

Below is a list of suggested retailers where you can find your gear and websites to help you research and choose your best option:

1. REI Co-Op https://www.rei.com/
2. Backcountry.com https://www.backcountry.com/
3. Amazon https://www.amazon.com/
4. Outdoor Gearlab https://www.outdoorgearlab.com/

Gear Essentials

Gear Basics

Camping is like staying in a primitive cabin, minus the cabin itself. So, in addition to your tent, pack as though you're going to stay someplace where there's little or no furniture, no electricity, no stove or refrigerator, and the cupboards are bare. In a developed campground you will have running water and a community bathroom a few hundred yards away. A typical campsite has a table (if not, you'll want to bring one), a place to park a car and a place to pitch a tent.

You can keep your initial investment low if you borrow or rent the priciest items—the tent and your sleeping bags and pads. That's a better strategy than paying bottom dollar for something that might not even last for a single camping trip. That said, if you are ready to invest in your very own camping gear, here are a few tips to help you decide exactly what to buy.

- **The tent:** If your budget can go a little bigger, then go bigger with your tent: A 3-person tent gives a cozy couple a little extra breathing room, and a family of four can more easily achieve harmony in a 6-person tent. You can also check the tent's peak height if you want a tent that you can stand up in (that can make getting dressed and moving around easier to do). Vestibules outside the doors are nice for stowing muddy shoes and having two doors can help you avoid climbing over sleeping tentmates for late-night bathroom breaks.

Tip: Practice setting up your tent at home first. And don't forget a properly sized footprint—if you have a ground sheet that's too small, it won't fully protect your tent floor, and if you have one that's too big, it can catch rainwater and pool it underneath your tent.

- **The sleeping bag:** When selecting your bag, temperature rating is a good place to start. If you're planning on only going fair-weather camping, a summer bag is probably all you'll need, but a 3-season bag will give you more leeway for unpredictable shoulder-season weather. If you're always cold (or always hot), adjust accordingly. And no need to go with a super-snug mummy bag like backpackers use, when a rectangular camping bag will give your body more room to roam.

- **The sleeping pad:** A good sleeping pad is like the mattress on a bed, but it also has high-tech insulation to prevent you from losing body heat on the cold ground. Big air mattresses, like what your guests sleep on at home, might look temptingly plush, but their lack of insulation will likely leave you feeling cold. Take a look at specs when comparing sleeping pads—if one is thicker, longer or wider and has a higher insulation value (known as the R-value) — it will be more comfortable and warmer.

Tip: Set your tent, bag and pad up early, so you don't have to do it in the dark.

- **Lighting:** Campsites don't have illumination, so you have to bring your own. A flashlight is OK, but a headlamp frees up your hands for camp tasks. A lantern is nice for ambient light. (You can also build a campfire, but watch for fire restrictions.)

- **Stove:** A classic single-burner propane camp stove should do the trick. You won't spend a fortune and you can cook breakfast and prepare your morning brew at the same time. Bring at least a couple of fuel canisters and a lighter, and fire it up once at home to be sure you know how it works.

- **Pots, plates, cups and sporks:** You gotta bring everything necessary for food prep and consumption. You can raid your home kitchen, just don't bring the fine china. And, unless you plan to take dirty dishes home, you'll need a scrubber, biodegradable soap, a towel and a small washtub or two (one for dirty, one for clean).

Tip: Pack all your kitchen gear in a large clear plastic bin with a lid. It's easy to store away at home and everything will be ready next time you want to camp.

- **Camp Chairs:** These are optional if you can sit at the camp picnic table, but downtime will be a little more enjoyable when you have a comfy place to perch. (And a hammock is even better, especially for afternoon naps.)

Tip: Mesh camp chairs let water drain easily and they dry quickly if left out in the rain or morning dew.

Recommended Gear Brands

Category	Gear	Brands	Notes
Packing	*Backpack*	**Osprey**	Pack size is dependent on trip length. For a 3 to 6 day hike a 60 L or larger pack is preferred. Look for good suspension with a breathable back. Should support hydration system.
	Daypack	**Osprey**	A good hydration system is key.
	Compression/Stuff Sacks	**Sea to Summit**	These will protect your gear within your pack and help to keep it organized.
	Pack Cover	**Osprey**	Make sure the cover fits completely around your pack when fully loaded.
Shelter	*Tent*	**REI Co-Op** **Big Agnes** **Nemo** **Kelty**	1 man tent is recommended but a 2 man is nice if you prefer the extra room. Pay attention to the total weight.
Sleep System	*Sleeping Bag*	**Big Agnes** **Marmot** **REI Co-Op** **Nemo**	20 degree rating is preferred. Major differences are between down or synthetic. Each has its benefits.
	Sleeping Pad	**Therm-a-Rest** **Klymit** **Nemo**	Pay attention to thermal rating. Should come with patch kit.
	Camp Pillow	**Sea to Summit** **Klymit**	Optional.
Kitchen	*Stove*	**Jetboil**	Need to be light and compact. Single burner is sufficient.
	Utensils		Light weight with a long reaching handle work best
Health, Hygiene & Safety	*First Aid Kit*		Should be compact, water resistant container.
	Wipes	**Dude Wipes**	Must be biodegradable
	Water Filter	**Sawyer** **Lifestraw** **Platypus**	Gravity fed filter style work best.
Personal Gear	*Gaiters*	**Outdoor Research**	
	Trekking Poles	**Black Diamond**	Needs to be dependable and durable.
	Camp Chair	**Helinox** **REI-Co Op**	Optional. Lighter the better

Navigation/Electronics	***Radio***	**Motorola**	Optional. Only needed if in a group. Allows you to talk to one another. Only works if you have line of sight.
	Battery Pack Charger	**Anker**	
	Solar Power	**Goal Zero**	Optional
	GPS	**Garmin**	Wrist device such as the Garmin Fenix work well. A hand held will offer more options but not necessary.
	PLB & Satellite Messaging	**Garmin**	The Garmin inReach series are the best on the market.

Recommended Gear Retailers and Websites

Below is a list of suggested retailers where you can find your gear and websites to help you research and choose your best option:

1. REI Co-Op https://www.rei.com/
2. Backcountry.com https://www.backcountry.com/
3. Amazon https://www.amazon.com/
4. Outdoor Gearlab https://www.outdoorgearlab.com/

Gear Checklist

*Optional depending on temperature and weather conditions.

Packing Gear:

- ☐ Backpack _____lbs.
- ☐ Daypack _____lbs.
- ☐ Compression/Stuff Sack _____lbs.
- ☐ Pack/Rain Cover _____lbs.

Shelter:

- ☐ Tent _____lbs.
- ☐ Tent Pad _____lbs.

Sleep System:

- ☐ Sleeping Bag _____lbs.
- ☐ Sleeping Pad _____lbs.
- ☐ Camp Pillow _____lbs.

Kitchen:

- ☐ Stove/Burner _____lbs.
- ☐ Fuel _____lbs.
- ☐ Pot/Cup _____lbs.
- ☐ Utensil _____lbs.

Personal Gear:

- ☐ Trekking Poles _____lbs.
- ☐ Gaiters _____lbs.
- ☐ Camp Chair _____lbs.
- ☐ Flashlight/lamp _____lbs.
- ☐ Headlamp _____lbs.
- ☐ Knife _____lbs.
- ☐ Multi-tool _____lbs.
- ☐ Parachute Cord 50 ft. _____lbs.
- ☐ Extra Batteries _____lbs.
- ☐ Camp Shoes _____lbs.

Navigation and Electronics

- ☐ Map _____lbs.
- ☐ Compass _____lbs.
- ☐ GPS _____lbs.
- ☐ PLB & Sat. Messaging _____lbs.
- ☐ Handheld Radio _____lbs.
- ☐ Battery Charger _____lbs.
- ☐ Phone _____lbs.

Health, Hygiene, and Safety:

- ☐ First Aid Kit _____lbs.
- ☐ Water Filter _____lbs.
- ☐ Personal Wipes _____lbs.
- ☐ Sunscreen _____lbs.
- ☐ Lip Balm _____lbs.
- ☐ Insect Repellant _____lbs.
- ☐ Personal Medication _____lbs.
- ☐ Sunglasses _____lbs.
- ☐ Camp Towel _____lbs.

Clothing:

- ☐ Base Layer – Torso
- ☐ Base Layer – Legs
- ☐ Mid Layer – Torso*
- ☐ Mid Layer – Legs*
- ☐ Outer Layer – Torso
- ☐ Outer Layer – Legs
- ☐ Briefs x 3
- ☐ Socks x 3 pair
- ☐ Hiking Boots
- ☐ Belt
- ☐ Hat
- ☐ Beanie*
- ☐ Neck Gaiter*
- ☐ Hiking Gloves
- ☐ Thermal Gloves*
- ☐ Rain Shell
- ☐ Sleep Clothes

Logistics

Travel

You can travel to Yellowstone by either plane or vehicle. The nearest airport to the park is the Gallatin Field Airport in Bozeman, Mt.

Departure Flight

Route: Lafayette (LFT) to Bozeman (BZN)

Date: _____

Depart Time: _____

Arrival Time: _____

Flight Number: _____

Return Flight

Route: Bozeman (BZN) to Lafayette (LFT)

Date: _____

Depart Time: _____

Arrival Time: _____

Flight Number: _____

Lodging

There is plenty of available lodging in the Yellowstone National Park area. Lodging information here:

Hotel Name: _____ Check-In Date: _____

Transportation:

Vehicle needs to fit all members of the expedition with enough room to also haul all your gear and supplies.

Rental Service: _____ Pickup Location: _____

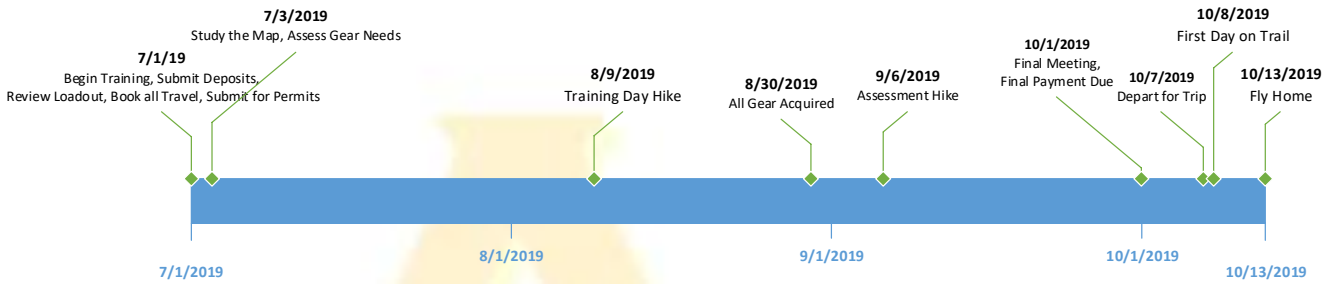
Type of Vehicle: _____

Shuttle Plan:

Shuttle Service: _____ Pickup Date/Time: _____

Preparation & Training

Timeline



Study the map

Provided in this loadout are maps of the route which you can use to familiarize with the journey. Study the layout of the land and all the significant land features. Use mapping tools such as Google Earth to help visualize your journey.

Submit Permit requests

You need to know when permits are being accepted and to be sure to submit them as soon as you can in order to secure the desired sites. Refer to the Fees and Passes section of this loadout for more details.

Book travel and lodging arrangements

Travel and lodging arrangements should be made 3 months prior to departure. Ensure your vehicle has the capability to hold all your gear and get you where you're going. You can input your travel details in the Logistics section of this loadout once you have them.

Trip Insurance

For your protection, we strongly recommend the purchase of trip insurance. It will protect you against financial loss in the event of trip cancellation or interruption, medical expenses, travel delay, emergency evacuation or other circumstances. Follow the following link to find out more:

https://www.imglobal.com/travel-insurance

Gear up

Begin purchasing needed gear. Refer to the Gear Loadout section of this loadout to determine your gear needs. Use the gear checklist to determine the total weight of your gear. For a multi-day trip your gear should be within the 30 to 35 lb. range without food and water. Assume 20 lbs. for water.

Learn your gear

Know how to setup and use your gear. Pull all your gear out, ensure it all works, and calculate the total weight (you can use the Gear Checklist to record weights). Become familiar with your pack. Find an efficient way to pack it that works for you.

Physical Self-Assessment

Request the AcadianX "MOUNTAINEERING PHYSICAL ASSESSMENT & BACKCOUNTRY READINESS QUESTIONNAIRE" to assess yourself.

Training

You need to prepare your body for carrying a heavy load for long periods of time. The "3 Way Training" program is a good basic program to help you meet that goal. This consists of training for three days a week doing 3 different exercises for a span of 3 months.

Day 1: Leg Training & Trail Run

Begin with leg training. This can consist of calisthenics, plyometrics, and strength training. Then follow up with a 2 – 3 mile trail run. Work on improving your time.

Day 2: Tower Day

This day consists of using a weighted pack or vest that is equivalent to the amount of weight you will be carrying and to climb a local parking tower. You can alternate between the ramps and the stairs or for more of a challenge you can use the stairs exclusively.

Day 3: Hiking Day

On this day grab your weighted vest or pack and head to the trail. Again you should have enough weight to match the weight you will carry on your trip. Refrain from using trekking poles because you don't want to train your body to become dependent on them. Again go for 2 to 3 miles or more at a time and pay attention to pace. Maintaining between a 2 – 3 mile and hour pace is ideal.

For more in-depth advice on training and ways to physically prepare yourself for the mountains follow the link below:

Physical Training Fundamentals for Mountaineering

Assessment Hike

When training to go on a long distance trek or a summit attempt it is good practice to go on an overnight hiking trip in full gear at least one month before your scheduled adventure. This is a great way for you to assess your performance and break-in or test out your gear. Try to at least simulate the distances you will cover in a single day. For example when training for the Zion Traverse Trek, I took our group on an overnight hiking trip to Chicot State Park. This hike featured a 20 mile loop that was close to home (we are Cajuns from South Louisiana) with a hilly topography that was ideal for assessing our performance. Because our average daily distance planned for Zion was 9 miles, the Chicot loop gave us an ideal proving ground by offering similar hiking distances. When the hike was over, based on the group's performance, I was confident this team was ready to tackle highlands and canyons of Zion National Park.