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Explore Your World



Kings Canyon Loadout Package 2020



Kings Canyon National Park Trekking Expedition via the Rae-Lakes Loop Route

Information Compiled by the AcadianX Outdoor Adventure Group



Kings Canyon National Park

Kings Canyon National Park is an American national park in the southern Sierra Nevada, in Fresno and Tulare Counties, California. Originally established in 1890 as General Grant National Park, the park was greatly expanded and renamed to Kings Canyon National Park on March 4, 1940. The park's namesake, Kings Canyon, is a rugged glacier-carved valley more than a mile (1,600 m) deep. Other natural features include multiple 14,000-foot (4,300 m) peaks, high mountain meadows, swift-flowing rivers, and some of the world's largest stands of giant sequoia trees. Kings Canyon is north of and contiguous with Sequoia National Park, and both parks are jointly administered by the National Park Service as the Sequoia and Kings Canyon National Parks.

The Rae-Lakes Loop

The Rae Lakes Loop is one of the most popular hikes in Sequoia and Kings Canyon, if not in the entire Sierra. If you are planning to do this hike during the summer, it is wise to make reservations, as trailhead quotas often fill up. Wilderness permits for the Rae Lakes Loop are issued at the Roads End station, 5.5 miles beyond Cedar Grove. Even if you have a reservation, you must still check in and pick up your permit prior to starting your trip. The loop is 41.4 miles long and climbs from 5035' (1535m) at the trailhead to 11,978' (3651m) at Glen Pass. High water at stream crossings can be a problem in May and early June. Glen Pass may be impassable to hikers until mid-late July and even later for stock.

Ecosystems

Extreme topographic differences and a striking elevation gradient (ranging from 1,360 feet (412 m) in the foothills to 14,494 feet (4,417 m) along the Sierran crest) create a rich tapestry of environments, from the hot, dry lowlands along the western boundary to the stark and snow-covered alpine high country. This topographic diversity in turn supports over 1,200 species (and more than 1,550 taxa, including subspecies and varieties) of vascular plants, which make up dozens of unique plant communities. These include not only the renowned groves of massive giant sequoia, but also vast tracts of montane forests, spectacular alpine habitats, and oak woodlands and chaparral.

Geography

Kings Canyon National Park, located on the western slope of the Sierra Nevada to the east of the San Joaquin Valley, is divided into two distinct sections. The smaller and older western section centers around Grant Grove – home of many of the park's sequoias – and has most of the visitor facilities. The larger eastern section, which accounts for the majority of the park's area, is almost entirely wilderness, and contains the deep canyons of the Middle and South Forks of the Kings River. Cedar Grove, located at the bottom of the Kings Canyon, is the only part of the park's vast eastern portion accessible by road (via Highway

180). Although most of the park is forested, much of the eastern section consists of alpine regions above the tree line. Usually snow free only from late June until late October, the high country is accessible solely via foot and horse trails.

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 through the backcountry office the day before or on the day of the start of your trip. Advanced reservations can be made by applying for permits either by fax or mail at least 4 months before your planned trip.

Regulations and Safety Considerations

The national parks are home to a variety of wildlife, including some animals and plants with the potential to harm humans. Weather poses the greatest danger to hikers. Check the forecast and heat indexes before departing. Prepare for a variety of conditions -- from chilling rains to blistering heat. With all the beauty that this treasure has to offer there are many considerations you need to be aware of. Refer to the regulations and safety section of this loadout to make yourself fully aware of what to expect and rules you need to follow in order to preserve the beauty of the park.

Routes and Topography

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

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.

Logistics

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

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About Kings Canyon National Park

General Information

Kings Canyon National Park is an American national park in the southern Sierra Nevada, in Fresno and Tulare Counties, California. Originally established in 1890 as General Grant National Park, the park was greatly expanded and renamed to Kings Canyon National Park on March 4, 1940. The park's namesake, Kings Canyon, is a rugged glacier-carved valley more than a mile (1,600 m) deep. Other natural features include multiple 14,000-foot (4,300 m) peaks, high mountain meadows, swift-flowing rivers, and some of the world's largest stands of giant sequoia trees. Kings Canyon is north of and contiguous with Sequoia National Park, and both parks are jointly administered by the National Park Service as the Sequoia and Kings Canyon National Parks.



Figure 1: Kings Canyon from Mist Falls trail.

Much of the 461,901-acre (186,925 ha) park, drained by the Middle and South Forks of the Kings River and many smaller streams, is designated wilderness. Tourist facilities are concentrated in two areas: Grant Grove, home to General Grant (the second largest tree in the world, measured by trunk volume) and Cedar Grove, located in the heart of Kings Canyon. Overnight hiking is required to access most of the park's backcountry, or high country, which for much of the year is covered in deep snow. The

combined Pacific Crest Trail/John Muir Trail, a backpacking route, traverses the entire length of the park from north to south.

General Grant National Park was initially created to protect a small area of giant sequoias from logging. Although John Muir's visits brought public attention to the huge wilderness area to the east, it took more than fifty years for the rest of Kings Canyon to be designated a national park. Environmental groups, park visitors and many local politicians wanted to see the area preserved; however, development interests wanted to build hydroelectric dams in the canyon. Even after President Franklin D. Roosevelt expanded the park in 1940, the fight continued until 1965, when the Cedar Grove and Tehipite Valley dam sites were finally annexed into the park.

As visitation rose post–World War II, further debate took place over whether the park should be developed as a tourist resort or retained as a more natural environment restricted to simpler recreation such as hiking and camping. Ultimately, the preservation lobby prevailed and today, the park has only limited services and lodgings despite its size. Due to this and the lack of road access to most of the park, Kings Canyon remains the least visited of the major Sierra parks, with just under 700,000 visitors in 2017 compared to 1.3 million visitors at Sequoia and over 4 million at Yosemite.

(Wikipedia contributors, 2020)

Recreation

Grant Grove, the only vehicular entrance to the park, is 60 miles (97 km) east of Fresno via Highway 180.[94] In addition to Highway 180 from the west, Highway 198, the Generals Highway, provides access from Sequoia National Park in the south.[51]:19 The roads converge in Grant Grove Village, from where Highway 180 continues another 35 miles (56 km) northeast to Cedar Grove. There is no vehicular access from Highway 395 on the eastern side of the park. There is currently no public transportation to

Kings Canyon National Park; the Big Trees Shuttle, which originally operated between Sequoia National Park and Grant Grove, is no longer in service.



Figure 2: A forested area of Kings Canyon National Park near Grant Grove, the original park established in 1890.

The National Park Service maintains visitor centers at Grant Grove and Cedar Grove. Grant Grove Village is the most developed part of the park and includes the 36-room John Muir Lodge (the park's largest hotel), visitor cabins, a restaurant and a general store. Cedar Grove also has a small market, but overall, the facilities there are much more limited. Barring extreme weather, the Grant Grove section is open year-round; Cedar Grove is closed in winter. Highway 180 is plowed only as far as Princess Meadow, the junction with the Hume Lake Road, which remains open to Hume Lake in winter.

Due to its limited road access, Kings Canyon receives much fewer visitors than its neighboring national parks, Sequoia and Yosemite. The overall decline in national park visitation in the late 1990s hit Kings Canyon considerably harder than the other parks; from 1970 to 1990 it averaged almost a million visitors per year, but in the 21st century, it has averaged just 560,000. In 2016, it saw an increase to 607,479 visitors, which (with the exception of 2009) was the highest count since 1995. Since records began in 1904, an approximate total of 53 million people have visited Kings Canyon.

Hiking & Campgrounds

In Grant Grove, the three major campgrounds are Azalea, Crystal Springs and Sunset, with 319 sites in total. With the

exception of Sunset, they operate on a first-come, first-served basis. Cedar Grove has 314 sites in the Sentinel, Sheep Creek and Moraine Campgrounds, which are also first-come, first-served; sites at the Canyon View group camp must be reserved. During high demand periods, additional campsites may be placed on a reservation system. All campgrounds have flush toilets and showers, although water use may be restricted depending on the season.

There are a number of day hikes in the parts of Kings Canyon National Park accessible by road. In the Grant Grove area a one-mile (1.6 km) trail leads to the General Grant Tree, and several longer trails reach nearby points of interest such as Redwood Mountain, the largest sequoia grove. In Cedar Grove, easy hikes include the boardwalk path through Zumwalt Meadow – providing broad views of Kings Canyon – and the short walk to Roaring River Falls; there are also many longer day hikes such as an 8-mile (13 km) round trip to Mist Falls, and the 13-mile (21 km) round trip climb to Lookout Peak above Kings Canyon.



Figure 3: Roaring River Falls, 40 feet (12 m) high, is easily accessed via a short hike in Cedar Grove.

A number of historical sites in the park are easily accessible via short walks, including Gamlin Cabin, built circa 1872 by the Gamlin brothers who had a timber claim at Grant Grove before it became a national park. It is believed to be the first permanent structure built in the park area. Knapp Cabin, listed on the National Register of Historic Places, is the oldest surviving structure in Cedar Grove, dating back to 1925. Another point of interest is the extensive Boyden Cavern system whose entrance is

located just outside the park's western boundary, in the Monarch Wilderness. As of 2016, the cave was closed due to damage from the Rough Fire.

Backcountry Travel

Since most of Kings Canyon is wilderness and roads extend only a small distance into the park, backpacking (and less commonly, horsepacking) are the only way to see most of the park. Unlike day hikers, overnight backpackers must obtain a wilderness permit from a ranger station or visitor center. During the peak tourist season (typically between May and September), a quota applies for wilderness permits, of which 75 percent are set aside for prior reservations, with the remainder for walk-ins. Outside the quota period permits are still required, although the limit no longer applies. Although backpackers account for a relatively small percentage of the total visitors, some of the backcountry trails are still quite heavily used. Due to the popularity of some backcountry camps, stays can be limited to one or two nights. During the summer, the Park Service staffs backcountry ranger stations at McClure Meadow, Le Conte Meadow, Rae Lakes, Charlotte Lake and Roaring River.

Road's End at Cedar Grove is a major jumping-off point for trips into the backcountry. The Rae Lakes Loop, 41.4 miles (66.6 km), is one of the most popular backpacking trips and passes through the deep canyons of Paradise Valley, the high Woods Creek suspension bridge and exposed alpine country before reaching Rae Lakes, a chain of glacial tarns set below 13,000-foot (4,000 m) peaks. Rae Lakes Loop hikers also climb over Glen Pass reaching a peak elevation of just under 12,000 feet. From the top of the pass, hikers can see views of Rae Lakes and the surrounding basin. The combined Pacific Crest Trail/John Muir Trail forms the backbone of the trail system, winding about 77 miles (124 km) from Piute Canyon at the park's northern tip to Forester Pass, 13,153 ft (4,009 m), in the south. Many hikes in Kings Canyon, including Rae Lakes, include parts of the PCT/JMT. There are also trailheads at Grant Grove which lead to more moderate hikes in the lower western Sierra Nevada, many in the Jennie Lakes Wilderness (just outside the national park).



Figure 4: Rae Lakes (Middle Rae Lake shown) is one of several backpacking destinations in the park.

Many parts of the park, such as the Middle Fork of the Kings River, are more difficult to access, requiring multi-day hikes over difficult terrain. Simpson Meadow on the Middle Fork is a 23-mile (37 km), one-way hike from Cedar Grove, with well over 12,000 feet (3,700 m) of elevation change. Other trailheads outside the park provide access to some of its more isolated locations, such as Tehipite Valley, a 14-mile (23 km) one-way hike from the Wishon Dam trailhead in the Sierra National Forest. The 3,000-foot (910 m) exposed and unmaintained descent into the valley is "notorious" as one of the park's most difficult hikes. Several trails also access the park from the Owens Valley to the east; all surmount passes more than 11,000 feet (3,400 m) high. The closest and most heavily used eastern approach is via Onion Valley Road, which terminates about a mile (1.6 km) east of the park boundary in the Inyo National Forest. The Kearsarge Pass

Trail begins at Onion Valley Campground and links to the PCT/JMT via the eponymous pass.

During the spring and early summer, river crossings can be hazardous; in response the Park Service has installed bridges along some of the major trails. By late August or September of most years, rivers will have dropped to relatively safe levels. The high country is typically snow free between May and November, although in particularly wet years, large areas of snow may persist into July. In winter, cross-country skiing and snowshoeing are common activities. The Park Service provides ranger-led snowshoe walks and maintains some groomed trails in the Grant Grove area. Longer trips into the backcountry are also possible, although due to the rough terrain, typically deep snows, and lack of ranger patrols during the winter, this is recommended only for skilled winter travelers. As with backpacking, wilderness permits are required for any overnight trips in winter.

Climbing and Canyoneering

The large, exposed granite cliffs and domes in Kings Canyon provide opportunities for rock climbing. However, many such features require long or circuitous hikes to reach their bases, which deters many climbers. These include The Obelisk, overlooking Kings Canyon at the park's western boundary, multipitch climbs at Charlito Dome and Charlotte Dome well up the Bubbs Creek Trail, and Tehipite Dome, which requires a nearly 30-mile (48 km) roundtrip hike just to access. Many of the park's prominent peaks also require technical climbing – including North Palisade, the highest point in the park, and some of its neighbors along the Sierra crest. In *The High Sierra: Peaks, Passes, Trails* (2009) North Palisade is described as "the classic peak of the High Sierra ... It is striking from a distance and has routes that will challenge climbers of all abilities and preferences."

Canyoneering, bouldering, bushwhacking and rappelling are often necessary to explore parts of the backcountry without developed trails. A notably challenging route is down Enchanted Gorge in the Middle Fork backcountry, where Disappearing Creek vanishes under huge talus piles only to re-emerge several miles downstream, hence the name. Nearby Goddard Canyon is an easier – albeit still

rugged – route and is known for its scenic meadows and many waterfalls. The Gorge of Despair above Tehipite Valley is known for its combination of cliffs, waterfalls and deep pools, whose 3,000-foot (910 m) descent requires rappelling gear and wetsuits to achieve. Because of the park's size, lack of cell reception and limited personnel for search and rescue operations, only experienced cross-country travelers should attempt to hike off trail.

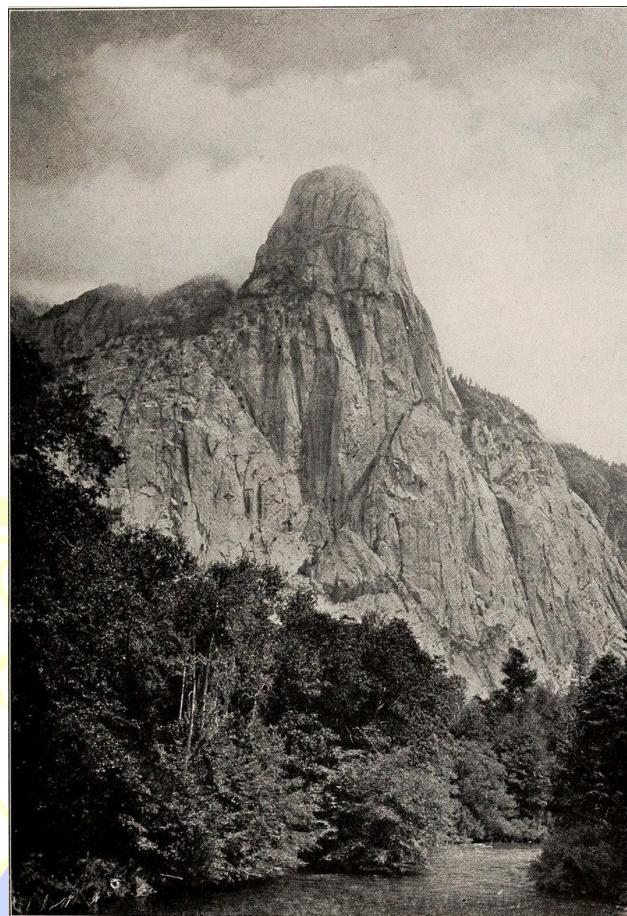


Figure 5: Tehipite Dome, in the Kings Canyon backcountry, has various climbing routes ranging from grade II–VI.

Water Sports

In Cedar Grove, about 10 miles (16 km) of the South Fork are considered good waters for fly fishing. Although the river was once stocked with trout, the Park Service has not stocked the river since the 1970s, in favor of letting the fishery return to natural conditions. While rainbow, brown, and brook trout are found in various stretches of the river, only rainbows are native to the Sierra Nevada,

the others having been planted by sportsmen in the early 20th century. The river is generally low and warm enough for wading by early autumn. In order to preserve the natural fishery, only catch and release is allowed for rainbows. A California state fishing license is required for visitors 16 years or older. The rainbow trout in the Kings river are small, usually no more than 8 to 9 inches (20 to 23 cm).

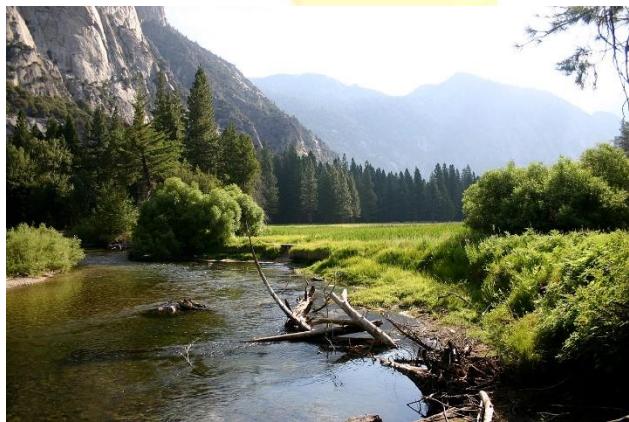


Figure 6: This section of the South Fork in Cedar Grove is closed to boating; however, swimming and fishing are permitted.

In order to protect riparian habitat, the gently flowing South Fork is closed to boating in Cedar Grove between Bubbs Creek and the western boundary of the park. However, swimming is allowed in certain sections of the river, with Muir Rock and the Red Bridge being popular swimming holes. Although there are many alpine lakes in the park at high elevations, most are impractical to access for boating or swimming. Nearby Hume Lake, formed by a historic mill-pond dam, is located in the Sequoia National Forest between the two sections of the park and is used for boating, swimming and fishing.

Most of the park's other rivers are extremely steep and fast-flowing and are suitable only for advanced kayaking. The Kings River above Pine Flat Reservoir is a commercial whitewater run with its put-in near the western boundary of the park, but most of the run itself is on national forest. Most rivers in the park itself are inaccessible by road. The Middle Fork is one of the most difficult-to-access whitewater runs in the entire state, since boats and equipment must be carried through miles of backcountry to reach it. Canoe Kayak magazine describes the Middle Fork run, which passes through some of the most isolated

parts of the Sierra, as "the very definition of epic with paddlers traveling around the world just to make a once-in-a-lifetime descent". Kayakers take about five days to descend the Class V Middle Fork from its 12,000-foot (3,700 m) headwaters to 900 feet (270 m) at Pine Flat Reservoir.

All information and images in this section adapted from: (Wikipedia contributors, 2020)

History

Native Americans

People have inhabited what is now Kings Canyon National Park for about 6,000–7,000 years. The Owens Valley Paiute peoples (also known as the Eastern Monos) visited the region from their homeland east of the Sierra Nevada, around Mono Lake. The Paiute mainly used acorns, found in lower elevations of the park, for food, as well as deer and other small animals. They created trade routes connecting the Owens Valley with the Central Valley west of the Sierra Nevada. The Yokuts, who lived in the Central Valley, also ventured into the mountains during summer to collect plants, hunt game, and trade. Because of the inhospitable winter climate, they did not establish permanent villages in the high country. Prior to European contact the Yokut population numbered between 15,000–20,000, and the Monos about 6,000.



Figure 7: Kearsarge and Bullfrog Lakes seen from Kearsarge Pass. The pass was the main route for Paiute peoples traveling from the Owens Valley into Kings Canyon.

Around the 1500s AD, some of the Eastern Mono migrated across the Sierra Nevada into the Central Valley, where they created settlements adjoining Yokuts territory in the Sierra foothills near the Kings River. This group became known as the Monaches, or Western Mono. They eventually divided into as many as six distinct bands, of which one, the Wobonuch, lived in the area near Grant Grove. The native population suffered greatly after Europeans arrived in the 19th century (a smallpox epidemic killed off most of the Monache in 1862), and very few remain in the area today..

Early Exploration & Logging

The early Spanish exploration of California largely bypassed what is now Kings Canyon National Park. In 1805 Gabriel Moraga led an expedition through the Central Valley and crossed what is now the Kings River, bestowing the name Rio de los Santo Reyes (River of the Holy Kings) on the stream. Fur trappers also visited the areas in the 1820s, but most likely did not venture into the high country since beaver were only present at lower elevations. They were followed by prospectors during the California Gold Rush, which began in 1848. However, not much gold, nor other minerals, were discovered in this area. Hale Tharp, a disillusioned gold miner, is credited with the 1858 discovery of Giant Forest in Sequoia National Park, which led to the further exploration and discovery of the other sequoia forests in the area, including Grant Grove.



Figure 8: Gamlin Cabin, built by loggers in 1872, is the oldest surviving structure in Kings Canyon National Park.

During the 1860s, a road was built to Grant Grove and many of the sequoias there were logged. The first of several sawmills opened in 1862, and logging operations expanded north and almost entirely leveled Converse Basin, then one of the largest sequoia groves in the world (although the Boole tree, the grove's biggest, was spared). The General Grant tree was discovered by Joseph H. Thomas, a sawmill operator, in 1862. Thomas' business partners, the Gamlin brothers, held a claim to the land surrounding Grant Grove, and their dwelling (built around 1872) has been preserved as a historic site.

During the 1870s a government survey "disclosed the remarkable quality of General Grant Grove, and Israel Gamlin was persuaded to give up his claim so the area could be preserved." However, this did not entirely stop logging in the area – in 1875 a 300-foot (91 m) sequoia was chopped down and a section sent to the Philadelphia Centennial Exposition of 1876. Reportedly, "eastern people refused to accept the exhibit as part of a single tree and called it the 'California Hoax'." The Centennial Stump, and most of the tree, remain as prominent features in Grant Grove: "Ladies from a nearby logging camp used to conduct Sunday school services for their children upon the stump."

Wilderness Surveys

The first non-native people to venture into what is today considered the Kings Canyon backcountry or high country were likely John C. Fremont's party in 1844, which attempted to cross the Sierra Nevada by way of the Kings River. However, a snowstorm impeded their progress and they were forced to retreat to the Central Valley. In 1858, the J.H. Johnson party successfully crossed the Sierra via the route Fremont had intended to find, via Kearsarge Pass at the far eastern end of Kings Canyon.

The first scientific expedition to the area was the 1864 Whitney Survey, conducted by the Geological Survey of California led by William Brewer. After failed attempts to summit Mount Whitney, the Brewer party descended into the Kings Canyon via Native American paths where "they remarked its resemblance to the Yosemite and were impressed by the enormous height of its cliffs." Although the rugged terrain made travel difficult, they discovered a

route up the north wall of the canyon and named several prominent features, including Mount King, Mount Gardner, the Palisades, and Mount Brewer. From the summit of the peak that would bear his name, Brewer described the view:

Such a landscape! A hundred peaks in sight over thirteen thousand feet—many very sharp—deep canyons, cliffs in every direction almost rival Yosemite, sharp ridges inaccessible to man, on which human foot has never trod—all combined to produce a view of sublimity of which is rarely equaled, one which few are privileged to behold.

Brewer's party left Kings Canyon via Kearsarge Pass where they encountered a group of prospectors led by Thomas Keough. Although details on the Keough expedition are scarce, the miners had been prospecting on the North Fork of the Kings River and were returning to their homes in the Owens Valley, indicating that they must have crossed the Middle Fork – then considered a region impossible to access by white settlers – making them the first non-natives to do so. Around 1869, sheepherder Frank Dusy discovered and named the Middle Fork's Tehipite Valley, and later grazed his sheep there. Aside from such occasional uses, most of the high country remained little visited and mostly unexplored.



Figure 9: North Palisade from Windy Point, photographed by Ansel Adams, ca. 1936.

Park Creation

It was not until John Muir first visited in 1873 that Kings Canyon began receiving public attention. Muir was delighted at the canyon's similarity to Yosemite Valley, as it reinforced his theory that the valleys were carved by massive glaciers during the last Ice Age. This competed with Josiah Whitney's then-accepted theory that the mountain valleys were formed by earthquakes.[68]:88 Muir's writings on the geology of the park and the magnificence of its sequoia groves led to calls for preservation of the area, and Muir himself continued to lobby for the cause. In 1880 logging claims in the Grant Grove area were suspended by the federal government, in large part due to the political efforts of Colonel George W. Stewart.

In March 1890 a bill (H.R. 8350) was introduced to Congress by Representative William Vandever proposing the creation of Yosemite National Park. Subsequently, some "political intrigue" led to its substitution with H.R. 12187, which also included provisions for a General Grant National Park and the expansion of Sequoia National Park. The origins of this bill remain largely a mystery, although local politicians with an interest in preserving the park were likely involved. Daniel K. Zumwalt, an agent for the Southern Pacific Railroad – which owned many lumber interests in California – may have seen the park as a way to force their competitors in the Sequoia-Kings Canyon area out of business. On October 1, 1890 President Benjamin Harrison signed the bill into law, establishing General Grant National Park – the United States' fourth national park – which today is part of the smaller western section of Kings Canyon National Park.

For many years the primary way for tourists to reach General Grant National Park was the Stephens Grade, a rough wagon road over which a stagecoach operated from Visalia beginning in the early 1900s. Initially, the U.S. Army had to station troops to protect the park from illegal grazing and hunting. Although these eventually ceased to be a problem, the rising number of visitors created its own sanitation and waste issues. In the summer of 1907 about 1,100 people visited the park. A new road reached the General Grant National Park by 1913; that summer, the park saw almost 2,800 tourists. In 1914 the park was

turned over from military to civilian control (though the National Park Service was not formally established until 1916).



Figure 10: Paintings of Kings Canyon by Albert Bierstadt, early California landscape artist. Left: Kings River Canyon, California (ca. 1870) Right: Mount Brewer from King's River Canyon, California (1872)

Park Expansion & Dam Controversy

The future of the park's much larger eastern section remained in doubt for almost fifty years. The backcountry was largely inaccessible and unknown to tourists, requiring several days' journey on horseback through some very rugged terrain. Instead, the area was targeted by water supply and power interests including the city of Los Angeles, who wanted to build hydroelectric dams in Kings Canyon. Due to its heavy flow and long drop – 11,000 feet (3,400 m) in less than 80 miles (130 km) – the Kings River has considerable hydroelectric potential, and

reservoirs were proposed for Cedar Grove, Tehipite Valley and Simpson Meadow, among other sites. Development interests blocked legislation that would have made the area a national park, but at the same time, the environmental lobby prevented any of these projects from being built.

In 1935 the Generals Highway was completed connecting Sequoia and General Grant National Parks. In 1939 State Route 180 from Grant Grove to Kings Canyon was finally completed after ten years of construction, finally allowing large numbers of tourists to visit Cedar Grove for the first time. The road was built in part using state prison labor. However, a proposal to extend the state highway over Kearsarge Pass to the Owens Valley was defeated.



Figure 11: Middle Fork at Kings River from South Fork of Cartridge Creek, Kings River Canyon, photographed by Ansel Adams, 1936.

Well-graded hiking trails were also extended into the backcountry to replace the rough pack trails used by sheepherders – including the John Muir Trail, completed in 1933 through what is now the eastern edge of Kings Canyon National Park. For many years a tiny ranger station and a few private structures (such as Knapp Cabin) had

been the only development in Cedar Grove. Starting in 1937, large campgrounds were developed in Kings Canyon by the U.S. Forest Service, but construction of more permanent facilities was foregone since the area would lie at the bottom of one of the proposed reservoirs.

Ultimately, local opposition to Los Angeles' attempts to secure the Kings River turned into significant political pressure to create a national park, which would prevent any dam projects there. United States Secretary of the Interior Harold Ickes was a major proponent for the expansion of the park, and worked to unite local interests, who had widely different views on how much development should be allowed. Ickes also hired Ansel Adams to photograph and document the area, generating publicity for the preservation movement. However, in order to placate the local irrigation districts – who wanted to leave open the option of reservoirs – Cedar Grove and Tehipite Valley were specifically excluded from the new park. On March 4, 1940, President Franklin D. Roosevelt signed the bill to create Kings Canyon National Park, which added the original General Grant National Park to over 400,000 acres (160,000 ha) of the High Sierra above Cedar Grove.

Later History & Additions

The new Kings Canyon administration initially struggled to manage the huge park, which was more than 700 times the size of the original unit at Grant Grove. In the early years staff and expertise were often loaned from Sequoia National Park. In 1943 the administrations of Kings Canyon and Sequoia National Parks were combined, as a cost-saving measure due to World War II. After the war, the arrangement was preserved; today, the two parks are still managed as one. Postwar, visitation jumped enormously, from just over 82,000 in 1945 to 450,000 in 1951. Demand increased for tourist facilities at Cedar Grove, the terminus of the state highway – although the valley was not officially part of the park, having been omitted due to water-development interests. The extension of the road through the valley was controversial, due to potential ecological damage. By 1947 the Park Service had drafted a general plan including tourist lodges, concessions and a pack station.

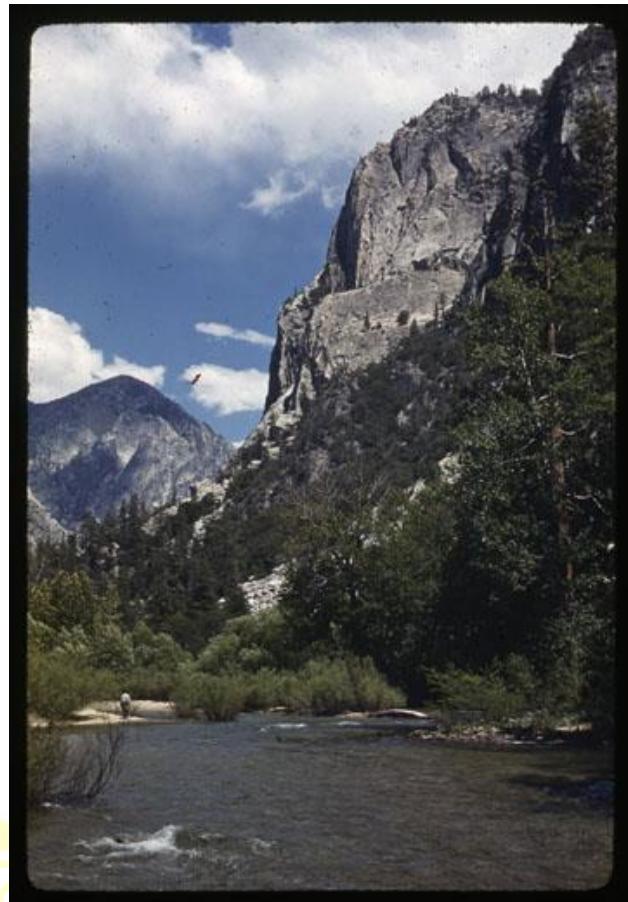


Figure 12: A view of the Kings River at Zumwalt Meadow in 1940, the same year most of Kings Canyon became a national park. This area would have been flooded by the proposed Cedar Grove Dam.

Then in 1948, Los Angeles unexpectedly re-filed its application to construct dams in Kings Canyon. The Kings River Conservation District (KRCD), representing local water agencies, immediately filed claims on the same sites. KRCD had no intention of constructing dams but hoped to block the possible threat to its water supply. Although the Federal Power Commission rejected Los Angeles' application, as it had prior to 1940, the city repeatedly refiled until 1963 when it was denied by both the California State Water Board and the federal government.

One factor in the project's final failure was that even though the Cedar Grove dam site was outside the park, the project required two additional dams to be built upstream if it were to be economically feasible. However, those sites were now inside the park boundary as designated in 1940. On August 6, 1965 Cedar Grove and

Tehipite Valley were finally added to the park, making them permanently off-limits to new dams as well. These annexations (with the exception of a tiny section in 1984, south of Grant Grove) brought Kings Canyon National Park to its present size.

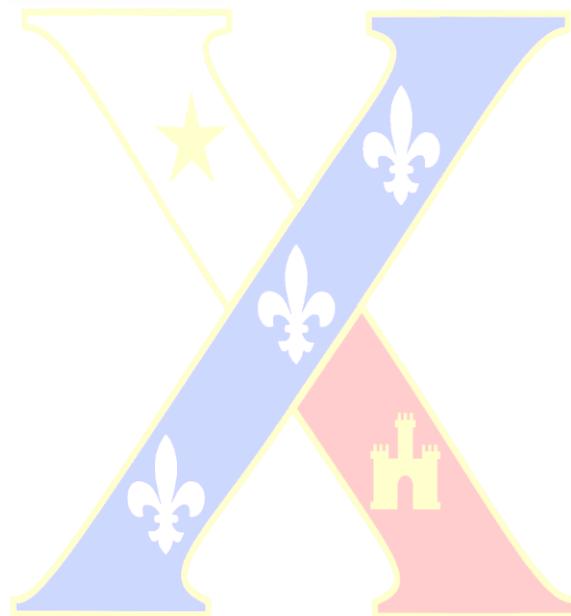
Starting in the 1950s, in response to growing traffic and crowding at national parks, the Park Service implemented Mission 66 which proposed large new visitor developments for Kings Canyon and other parks. This included new visitor centers at Grant Grove and Cedar Grove, electrification and sewage facilities at Cedar Grove, and substantial new accommodations, trails, and parking areas.

After the Cedar Grove development was delayed by the final years of the dam debacle, the Park Service released a new plan in 1972, which included cabins for 260 people, and an 11,000-square-foot (1,000 m²) store and cafeteria complex, hoping to develop the area in a way similar to Yosemite Valley. In 1974 the park saw 1,216,800 visitors, a number that has not been exceeded since. However, by

1975 public hearings showed such an opposition to intense development, that ultimately only a small lodge and store were added to the canyon.

The rising number of visitors to the backcountry – from 8,000 in 1962 to over 44,000 in 1971 – created its own problems in the form of litter, illegal campfires and contact with dangerous wildlife such as bears. In 1966 and 1971 the Park Service proposed, controversially, to designate most of the park as wilderness, which would place much greater restrictions on its use. In 1973 the number of backpackers was first restricted via a quota system. Finally, on September 28, 1984, Congress designated over 85 percent of Kings Canyon and Sequoia National Parks as wilderness. In 1987, the Middle and South Forks of the Kings River were designated Wild and Scenic.

All information and images in this section adapted from:
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Ecosystems

Plant Life

Extreme topographic differences and a striking elevation gradient (ranging from 1,360 feet (412 m) in the foothills to 14,494 feet (4,417 m) along the Sierran crest) create a rich tapestry of environments, from the hot, dry lowlands along the western boundary to the stark and snow-covered alpine high country.

This topographic diversity in turn supports over 1,200 species (and more than 1,550 taxa, including subspecies and varieties) of vascular plants, which make up dozens of unique plant communities. These include not only the renowned groves of massive giant sequoia, but also vast tracts of montane forests, spectacular alpine habitats, and oak woodlands and chaparral.

The richness of the Sierran flora mirrors that of the state as a whole--of the nearly 6,000 species of vascular plants known to occur in California, over 20% of them can be found within Sequoia and Kings Canyon National Parks.

Vegetation Zones

While the parks' vegetation is diverse and complex, it can be categorized broadly into the following zones:

- Foothills (includes oak woodland and chaparral shrubland)
- Montane Forests (lower to mid-elevation conifer forests)
- Subalpine (forest that extends to the limit of tree growth - treeline)
- Alpine (perennial plants that grow at the highest elevations)

Vegetation changes dramatically along a west-east elevation gradient from the lowest elevation oak woodlands up to ancient foxtail pines, stunted whitebark pine, and alpine perennial herbs at the highest elevations.

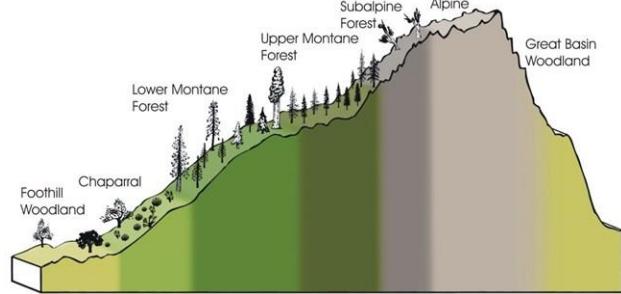


Figure 13: Graphic representation of Sierra Nevada vegetation zones from the oak woodlands and chaparral shrubland in the low-elevation foothills, to mid-elevation montane forests, subalpine forests that extend to the upper limit of tree growth, and the alpine zone that includes perennial herbs and shrubs

Foothills

Along the western edge of the parks, California's Great Central Valley gives way to blue oak woodlands and a mosaic of chaparral shrubland vegetation. Unlike most of the park vegetation, which is made up of plant species native to the region, the foothill grassland is primarily non-native annual grasses that were introduced to California during the mid-19th century and have subsequently become naturalized. The slow growing, gnarled blue oaks that dot this landscape can be hundreds of years old.



Figure 14: Foothill vegetation of Sequoia National Park: Blue oak woodland in the foreground and a denser mix of deciduous and evergreen hardwoods in the background.

Chaparral - a type of plant community dominated by dense thickets of sclerophyllous (thick-leaved) shrubs - occurs at somewhat higher elevations than oak woodlands in the foothills. Characteristic of lowland Mediterranean climates, it grows where winter rains provide most of the precipitation and, but for the hot dry summers, temperatures are relatively mild. Many chaparral species have specific adaptations to fire and drought, both of which have a strong influence on life in the foothill environment.



Figure 15: Chaparral shrub vegetation in the foreground, with conifer forests and snowy peaks in the background. This is along the road to the Mineral King area of Sequoia National Park.

A greater variety of plants and animals live in these low elevations than in the rest of the parks. The dense brush of chaparral hides many animals from view, and you may have to listen as well as look to find the birds in these areas. In the open grasslands under oak trees, wildlife such as deer, bears, bobcats, and foxes are easier to spot.

Winter and spring are the best seasons to visit the foothills. Wildflowers can be abundant, diverse, and colorful in the spring.

While foothills vegetation is extensive throughout the western Sierra Nevada, in most areas it is also largely changed due to grazing, agriculture, or rural development. Sequoia and Kings Canyon protect an extensive tract of foothills vegetation, important for the preservation of these diverse plant and animal communities.

Montane Forests

Unlike many of the cone-bearing, evergreen forests of the world, which are dominated by a single species of tree, the mixed-conifer montane forests that cloak the lower and middle slopes of the Sierra Nevada are remarkably diverse. Here ponderosa pine, incense-cedar, white fir, sugar pine, and scattered groves of giant sequoia intermix and coexist. These trees, many of which reach tremendous heights, form some of the most extensive stands of old-growth coniferous forest that remain in the world.



Figure 16: Ponderosa pine forest after a fire in the Cedar Grove area of Kings Canyon National Park. Fire is an important natural process in Sierra Nevada forests, reducing surface fuels, creating favorable conditions for young trees to establish, and maintaining the open structure of these forests.

The iconic giant sequoias grow interspersed with other trees in a mixed-conifer forest. These include white fir, sugar pine, incense-cedar, red fir, and ponderosa pine. While giant sequoias dominate in terms of size and volume, they are outnumbered by other types of trees. Giant sequoias are the world's largest trees when measured by volume and can live to be over 3,200 years old. They have a limited distribution, reflecting climatic patterns of the past several thousand years. Once more widespread, today they occur naturally only in the Sierra Nevada. In their current range, cold temperatures may have limited their expansion into higher elevations while drought has limited grove boundaries at low elevations. Soil characteristics also are important: Giant sequoias prefer deep, sandy loam soils that are wetter, less acidic, higher in calcium, and lower in nitrogen than soils associated with neighboring conifer forests.



Figure 17: The charring on the bark of these giant sequoias is from both recent prescribed burning and older fires. The thick bark of giant sequoias protects them from the heat of fires, and although some of the bark is burned, most of it typically remains intact.

Periodic fire plays an important role in giant sequoia reproduction. It stimulates seed release from cones, exposes mineral soil where the seeds can germinate, sterilizes the soil (killing seedling pathogens), and opens up the forest canopy to allow in enough sunlight for sequoia seedlings to establish and grow.

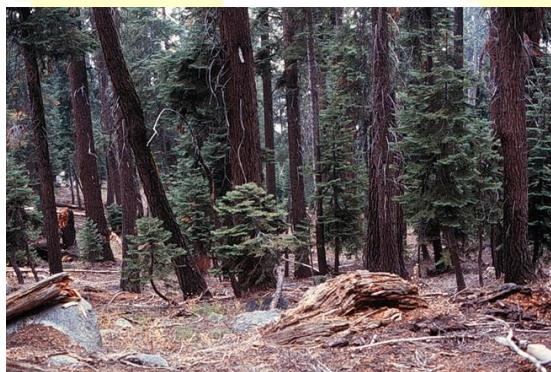


Figure 18: Red fir forests are typically shady, cool forests without many plants growing beneath them. While red fir can be interspersed with giant sequoias and white fir, they typically grow at higher elevations in stands where they are the dominant species.

In the upper montane, the mixed coniferous forest is replaced by nearly pure stands of red fir and lodgepole pine. Characterized by deep snow accumulation during the winter months and a dense canopy that limits the amount of sunlight that reaches the forest floor, the red fir forests lack a diverse herbaceous component. Only the most shade tolerant herbs thrive beneath the towering trees. Lodgepole pines have an unusual distribution,

growing in both moist lowlands and in drier sites on benches and ridges. In wetter sites, these forests can support a rich assortment of herbs and wildflowers in their understory.

Subalpine Forests

Subalpine forests define the upper limit of tree growth in the Sierra. Trees in these forests can range from over 75 feet in height to the stunted and gnarled growth forms known as krummholz ("crooked wood" in German). Although occasionally found intermingling with the lodgepole and red fir forests below, the subalpine species are typically found between about 9500 to 12,000 feet in the southern Sierra. Trees you may encounter in the subalpine zone include mountain hemlock, whitebark pine, and foxtail pine, and occasionally western white pine, limber pine, and western juniper.

Three of these tree species can grow at the upper edge of forest (or "treeline") in the southern Sierra. They include whitebark pine, foxtail pine, and limber pine. Trees at these high elevations must be able to withstand harsh conditions, including cold temperatures, severe wind, and short growing season. Because these pines are the only trees in the upper subalpine zone, they play an important role regulating snowmelt and stream flow and providing habitat and food for birds and mammals. Below are photos and more information about these special trees.



Figure 19: Foxtail pine growing near treeline in the upper Kern area of Sequoia National Park.

Whitebark Pine

Whitebark pine has a wide geographic range in the west, including in the Rocky Mountains, the Cascades, and the

Sierra Nevada, where it reaches its southern limit near Mt. Whitney in Sequoia National Park. Whitebark pine occurs on both the west and the more arid east side of the Sierra crest in scattered treeline stands. The seeds of whitebark pine provide an important food source for many seed-eating birds and mammals. Whitebark pine is entirely dependent upon Clark's Nutcracker (a medium-sized relative of the crow) for dispersal of its large wingless seeds. While severe declines in whitebark pine are occurring range-wide, Sierra Nevada populations are still healthy.



Figure 20: Whitebark pine in the Evolution Basin area of Kings Canyon National Park. Whitebark pine can grow as an upright tree form as well as a shrubby krummholz form - an adaptation to difficult growing conditions created wind, ice, and persistent snow.

Foxtail Pine

In contrast to whitebark and limber pine, foxtail pine has a limited distribution. It is endemic to California and is confined to two discrete regions: the Klamath Mountains of northwestern California and the southern Sierra Nevada. Foxtail pine always grows as an upright tree (not a shrubby krummholz form), even on the highest, most windswept and exposed sites. These trees are limited to high-elevation slopes, ridges and peaks, typically growing in open stands that are almost purely foxtail pine with little other vegetation. Like the whitebark pine, foxtail pine provide important habitat and food for birds and mammals. The oldest known foxtail is over 2,000 years old. Both live and dead wood of this species can be dated to produce multi-millennial tree-ring records used to reconstruct long-term variations in climate.



Figure 21: Backpacker hikes through a stand of foxtail pine near Little Claire Lake in Sequoia National Park.

Limber Pine

Limber pine has a large distribution across western mountain ranges and occurs in a wide range of environments from lower elevation sites to treeline. It is uncommon in Sequoia and Kings Canyon National Parks, but extensive stands occur east of the Sierra crest in the Inyo National Forest and in the White Mountains of eastern California. It is a spreading or sprawling tree of high windy ridges and dry slopes. Limber pine is a pioneer on severe sites, moderating the environment to facilitate establishment of other species. Near its upper limits, the trunks of limber pine often arch over like a crescent and the treetop touches the ground as a result of centuries of harsh winds. Its seeds are food for numerous birds and mammals and are dispersed by Clark's Nutcrackers and small rodents.

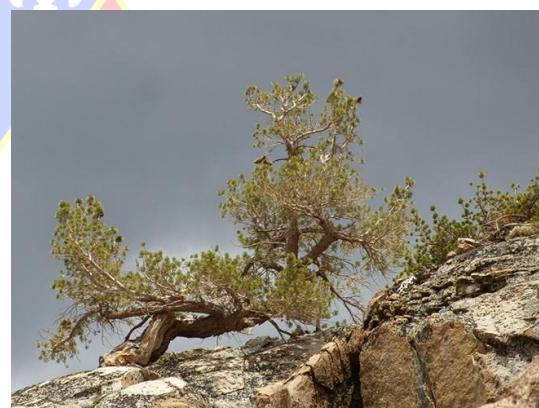


Figure 22: To withstand harsh growing conditions on windy, exposed slopes and ridges, the limber pine often has a low growth form, sprawling along rocks instead of growing upright.

Alpine

In the rocky alpine, where the short growing season and harsh winter conditions exclude all but the hardiest of plants, stunted trees give way to low-growing, perennial herbs. Here plants often form ground-hugging mats or hummocks to take advantage of the warmer surface temperatures. In winter, the snowpack provides insulation from sub-freezing temperatures and desiccating winds. During the brief summer, when freezing temperatures and snowstorms remain a threat, surprisingly showy flowers burst forth in the race to set seed before winter returns.



Figure 23: Hiker walking in rocky alpine terrain in Sequoia National Park. Subalpine forests and the upper limit of tree growth (treeline) can be seen in the background.

With over 48 percent of Sequoia and Kings Canyon National Parks occurring above 10,000 feet, high-elevation habitats dominate these parks. Crowning the tops of the mountains, the alpine zone is biologically rich despite harsh growing conditions. Approximately 600 species of vascular plants grow in these areas, with at least 200 of those being restricted only to the alpine zone.

With its scattered lakes, meadows, rugged peaks, vivid flowers, and scenic vistas, the alpine zone draws over 100,000 visitors each year, most of them traveling on foot to these remote wilderness landscapes.

Life in the Alpine

The alpine environment provides primary habitat for a number of sensitive or at-risk organisms in these parks, including American pika, Sierra Nevada bighorn sheep,

Yosemite toad, mountain yellow-legged frogs, and 32 of the parks' special status plants. Characteristic bird species in the alpine include gray-crowned rosy finches and American pipits, which feed on insects near mountain lakes. Numerous animals that live across a wide elevation range visit the alpine to forage on plants or hunt for small mammals, amphibians, insects, and occasionally catch fish. Examples include black bears, coyotes, bats, and various birds of prey such as prairie falcons and golden or bald eagles.



Figure 24: Oval-leaved buckwheat is a cushion-type plant that avoids drying winds and absorbs warmth by growing close to the sun-warmed ground and rocks.

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Animal Life

Sequoia and Kings Canyon National Parks have an impressive elevation range from the low foothills to the Sierra Nevada peaks, and provide habitat for a diversity of animals. Below are highlights of animals you can find at different elevation zones of the parks, and links to learn more about park animals.

Foothills

In the low-elevation foothills, summers are hot and dry and winters are mild. You will find oak woodlands, dense chaparral shrubs, and riverside vegetation like California sycamores, willows and cottonwoods. A number of animals live in this area year-round, while some only winter or breed here. Local species include the gray fox, bobcat, striped and spotted skunks, black bear, woodrat, pocket gopher, white-footed mouse, California quail, scrub jay, lesser goldfinch, wrentit, acorn woodpecker, gopher snake, California kingsnake, striped racer, western whiptail lizard, and the California newt.

Montane Forests and Meadows

In the low to mid-montane elevations are mixed forests of pine, incense-cedar, fir, and scattered groves of giant sequoia provide. Further upslope grow pure stands of magnificent red fir and lodgepole pine forest. Scattered meadows are lush with many kinds of flowers in the summer. Winters are typically snowy. Year-round and seasonal residents include the chickaree, gray squirrel, golden-mantled ground squirrel, mule deer, black bear, mountain lion, and a variety of birds. Resident birds include western tanager, violet-green swallow, white-throated swift, Wilson's warbler, olive-sided flycatcher, hermit thrush, western bluebird, and pileated woodpecker. Reptiles are not common, but occasionally mountain kingsnake, rubber boa, western fence lizard, and alligator lizard can be seen.

Subalpine and Alpine Areas

The high country is a land of lakes, meadows, some open forest, and miles of granite. Mammals are less common here, and food is scarce. Mammals inhabiting these high Sierra landscapes include the marmot, pika, and white-

tailed jack rabbit. Birds include the Clark's nutcracker, mountain bluebird, American pipit, and gray-crowned rosy finch. In this region, you may also be lucky enough to find a mountain yellow-legged frog or a Sierra Nevada bighorn sheep, both endangered species for which recovery efforts are underway.

Human impacts and management

Although most of the park is now designated wilderness, human activities have significantly modified the ecology of the area ever since Native American times. In order to clear areas for hunting game and to encourage the germination of certain plants, Native Americans set controlled burns in areas of overgrown brush and grass. During the early 20th century, ""complete fire suppression" policy led to a great build-up of debris and tinder in the park's forests. By the 1960s it became apparent that this was interfering with the reproductive cycle of the park's sequoias, whose bark is fire resistant but require regular fires to clear away competing growth such as white firs. In 1963, scientists deliberately set fire to part of the Redwood Mountain Grove, the first fire in any of the park's sequoia groves for 75 years. Thousands of new sequoia seedlings germinated. The success of the experiment led to the establishment of the park's first long-term prescribed burn program in 1972.

A major source of damage to the park in the late 19th century and early 20th century was summer livestock grazing, particularly sheep, in areas such as Tehipite Valley and the Roaring River valley (although sheep never entered Cedar Grove, due to the difficulty of accessing the bottom of Kings Canyon before Highway 180 was constructed). Ranchers drove their herds up into the Sierra Nevada to escape the drought and heat of the San Joaquin Valley. Meadows were trampled by thousands of hooves, leading to increased erosion and watershed degradation. Grizzly bears and wolves which preyed on livestock were shot, trapped and poisoned in large numbers, extirpating them from the Sierra by the early 1900s.

Although the Sierra Forest Reserve, including what would become Kings Canyon and Sequoia National Parks, was established in 1893, as many as half a million sheep were illegally grazed there. In 1917 the federal government began to crack down on illegal grazing and established a system of regulated management and range restoration, before sheep were banned from Kings Canyon altogether following the park's creation in 1940. Livestock grazing is still allowed in some national forest lands around the park. Occasionally hikers may come across gated drift fences in the wilderness designed to control livestock movement. Visitors must close all gates behind them to prevent livestock from wandering into protected areas.

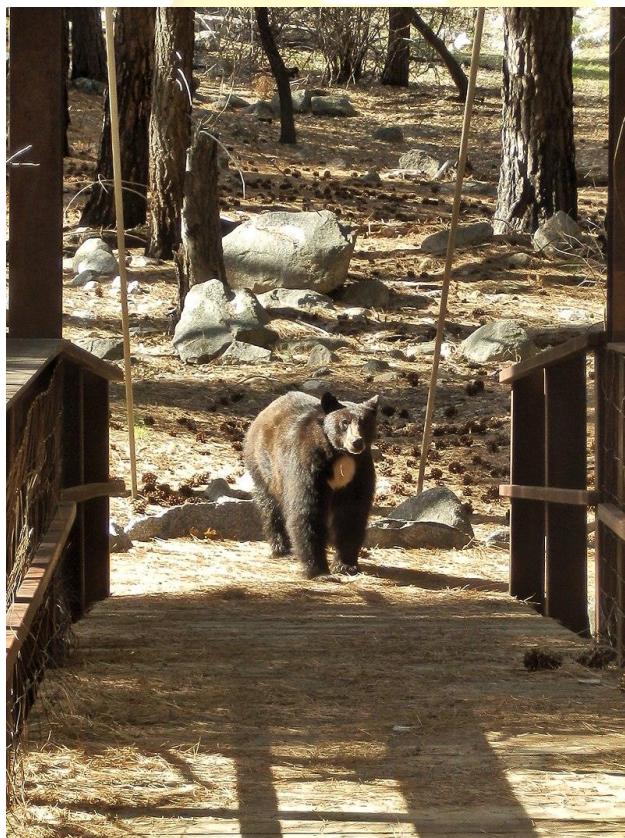


Figure 25: An American black bear in Kings Canyon National Park.

The decline of natural predators in the early 1900s led to a huge spike in the deer population, which further rose due to park visitors feeding them. Ultimately, this led to overgrazing and the vegetation understory was nearly eliminated in large areas of the park. When the park was expanded in 1940, the Park Service began shooting deer in an effort to reduce the size of the herd. Although the culling reduced deer numbers to a more ecologically stable level, the program was criticized for its reliance on brute force rather than more "hands-off" methods, such as re-introducing predators. Today, the only stock allowed in the park are pack horses and mules, which are only permitted in certain areas along major trails, and usually not early in the season in order to protect meadows in the spring while they are wet and soft.

The park continues to host a healthy population of black bears, which are typically not aggressive towards humans, but have a tendency to steal human food. The Park Service has placed bear lockers in campgrounds, required the use of bear canisters and attempted to relocate bears away from heavily visited areas. This has been successful in the backcountry, where bears have largely ceased to associate backpackers with food but remains an issue near developed campgrounds. Visitors are encouraged to store all food and scented items in lockers and dispose of trash in bearproof garbage cans. However, rangers are still sometimes forced to kill "problem bears" who become habituated to human food.

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Geography and Geology

Geography

Kings Canyon National Park, located on the western slope of the Sierra Nevada to the east of the San Joaquin Valley, is divided into two distinct sections. The smaller and older western section centers around Grant Grove – home of many of the park's sequoias – and has most of the visitor facilities. The larger eastern section, which accounts for the majority of the park's area, is almost entirely wilderness, and contains the deep canyons of the Middle and South Forks of the Kings River. Cedar Grove, located at the bottom of the Kings Canyon, is the only part of the park's vast eastern portion accessible by road (via Highway 180). Although most of the park is forested, much of the eastern section consists of alpine regions above the tree line. Usually snow free only from late June until late October, the high country is accessible solely via foot and horse trails.

The Sequoia-Kings Canyon Wilderness encompasses over 768,000 acres (311,000 ha) in Kings Canyon and Sequoia National Parks, or nearly 90 percent of their combined area. In addition to Sequoia National Park on the south, Kings Canyon is surrounded by multiple national forests and wilderness areas. The Sierra National Forest, Sequoia National Forest and Inyo National Forest border it on the northwest, west and east, respectively. The John Muir Wilderness wraps around much of the northern half of the park, and the Monarch Wilderness preserves much of the area between the park's two sections.

Geology & Natural History

Mountains & Valleys

Kings Canyon is characterized by some of the steepest vertical relief in North America, with numerous peaks over 14,000 feet (4,300 m) on the Sierra Crest along the park's eastern border, falling to 4,500 feet (1,400 m) in the valley

MAP OF THE PARKS

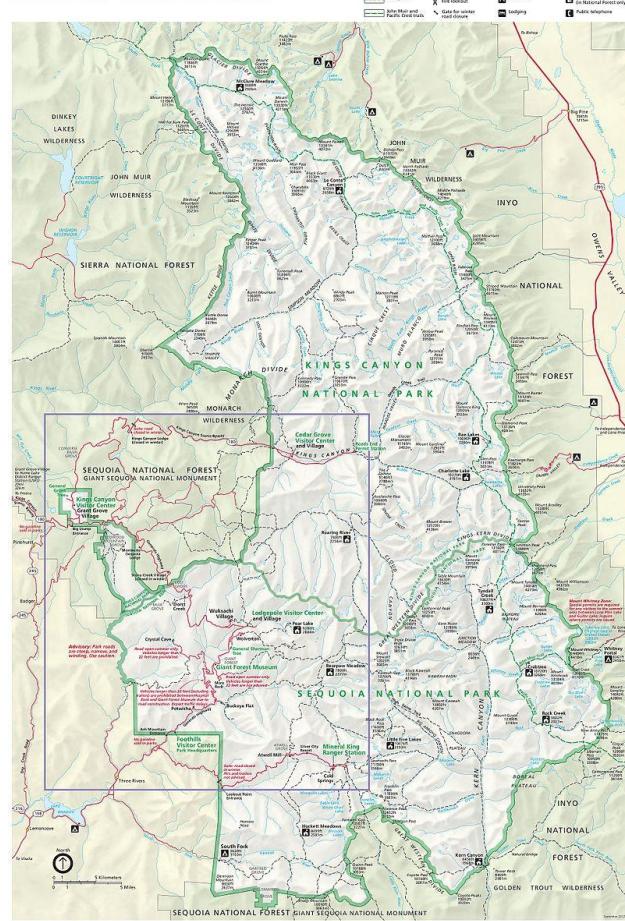


Figure 26: Map of Kings Canyon National Park.

floor of Cedar Grove just ten miles (16 km) to the west. The Sierran crest forms the eastern boundary of the park, from Mount Goethe in the north, down to Junction Peak, at the boundary with Sequoia National Park. Several passes cross the crest into the park, including Bishop Pass, Taboose Pass, Sawmill Pass, and Kearsarge Pass. All of these passes are above 11,000 feet (3,400 m) in elevation.

There are several prominent subranges of the Sierra within and around the park. The Palisades, along the park's eastern boundary, have four peaks over 14,000 feet (4,300 m) including the highest point in the park, 14,248 feet (4,343 m) NAVD 88 at the summit of North Palisade. The Great Western Divide extends through the south-central part of the park and also has many peaks over

13,000 feet (4,000 m), including Mount Brewer.[10] The Monarch Divide, stretching between the lower Middle and South Forks of the Kings, has some of the most inaccessible terrain in the entire park. In the northwest section of the park are other very steep and rugged ranges such as the Goddard Divide, LeConte Divide and Black Divide, all of which are dotted with high mountain lakes and separated by deep chasms.



Figure 27: Mount Agassiz is located on the Sierra Crest along the eastern edge of the park.

Most of the mountains and canyons, as in other parts of the Sierra Nevada, are formed in igneous intrusive rocks such as granite, diorite and monzonite, formed at least 100 million years ago due to subduction along the North American–Pacific Plate boundary. However, the Sierra itself is a young mountain range, no more than 10 million years old. Huge tectonic forces along the western edge of the Great Basin forced the local crustal block to tilt and uplift, creating the mountains' gradual slope to the west and the nearly vertical escarpment to the east bordering the Owens Valley. Many cave systems are also formed in the rock layers, including Boyden Cave along the South Fork of the Kings River.

Glacial Features

The present shape of the high country was largely sculpted by glaciations during successive Ice Ages over the last 2.5 million years. Large valley glaciers moved as far as 44 miles (71 km) down the South and Middle Forks of the Kings River, carving out the distinctive deep U-shaped valleys at

Cedar Grove and Paradise Valley on the South Fork, and Tehipite Valley on the Middle Fork. Ice Age glaciations did not extend all the way to the confluence of the Middle and South Forks; consequently, the canyons downstream of Cedar Grove and Tehipite are typical V-shaped river gorges, in contrast to the U-shaped valleys upstream.



Figure 28: The upper part of Kings Canyon, seen here at Zumwalt Meadow, was carved out by Ice Age glaciers.

The glacial valleys are characterized by flat floors and exposed granite cliffs and domes many thousands of feet high, similar in form to the more famous Yosemite Valley to the north, and in fact the term "Yosemite" was used in the 19th century by John Muir to describe these valleys before they were widely known by their own names. In *A Rival of the Yosemite*, published in 1891 in *The Century Illustrated Magazine*, John Muir wrote of Kings Canyon:

In the vast Sierra wilderness far to the southward of the famous Yosemite Valley, there is a yet grander valley of the same kind. It is situated on the south fork of the Kings River, above the most extensive groves and forests of the giant sequoia, and beneath the shadows of the highest mountains in the range, where the cañons are deepest and the snow-laden peaks are crowded most closely together. It is called the Big King's River Cañon, or King's River Yosemite ... The stupendous rocks of purplish gray granite that form the walls are from 2500 to 5000 feet in height, while the depth of the valley is considerably more than a mile.

The bottom of the valley ... is diversified with flowery meadows and groves and open sunny flats, through the midst of which the crystal

river, ever changing, ever beautiful, makes its way; now gliding softly with scarce a ripple over beds of brown pebbles, now rustling and leaping in wild exultation across avalanche rock-dams or terminal moraines ... From this long, flowery, forested, well-watered park the walls rise abruptly in plain precipices or richly sculptured masses partly separated by side cañons baring wonderful wealth and variety of architectural forms.

From the brink of the walls on either side the ground still rises in a series of ice-carved ridges and basins, superbly forested and adorned with many small lakes and meadows where deer and bear find grateful homes; while from the head of the valley other mountains rise beyond in glorious array, every one of them shining with rock crystals and snow, and with a network of streams that sing their way down from lake to lake through a labyrinth of ice-burnished cañons.

Other significant glacial features include Tehipite Dome, the largest granite dome in the Sierra, rising 3,500 feet (1,100 m) above the floor of Tehipite Valley. In Kings Canyon and across the high country, such sheer granite cliffs are subject to exfoliation, frost weathering and earthquakes which cause sudden and dramatic rockfalls. Over thousands of years, cliff collapses have built up large talus piles or scree slopes at their bases along almost every glacial valley in the park.

Zumwalt Meadow, one of the few large areas of flat land in the park, was formed by the accumulation of sediment behind the terminal moraine of a retreating glacier. In Kings Canyon there are in fact four such moraines, which the Kings River cascades over, forming whitewater rapids, in an area where it otherwise winds calmly across meadows. The series of moraines one behind the other are termed "nested moraines", each created during a different glacial period by glaciers of varying length.

Elsewhere in the high country, the landscape of bare rock and talus left by former glaciers is replete with hanging valleys, waterfalls, serrated ridges (arêtes), cirques, and hundreds of alpine tarns. Some of the highest peaks retain

permanent snowfields and even glaciers. Palisade Glacier, the largest in the Sierra, is located near the park's edge in the John Muir Wilderness. These glaciers are not holdovers from the Ice Ages; rather, they were most likely formed during cold periods in the last 1,000 years. The park's glaciers are now melting rapidly due to increased temperatures and may disappear completely within a few decades.



Figure 29: Dusy Basin includes many small lakes, such as this one, carved by glaciers from granite.

Watersheds

A number of major Sierra rivers have their origins in the park. The South Fork Kings River flows from near Taboose Pass, on the park's eastern boundary, and drains much of the southern half of the park, carving the canyon from which the park takes its name. The Middle Fork Kings River originates near Mount Powell and drains most of the park's northern half. A smaller section in the northern tip of the park is drained by the South Fork of the San Joaquin River.^[8] The Kings River falls more than 13,000 feet (4,000 m) from the Sierra crest to Pine Flat Reservoir in the San Joaquin Valley – the longest undammed drop of any North American river.

Most of the park's borders are formed by watershed divides between river basins. The eastern boundary follows the Sierra Crest, which to the east is drained by the Owens River, part of the Great Basin watershed. The southern boundary with Sequoia National Park is the divide between the Kings, Kaweah and Kern Rivers. Part of

the western boundary follows the divide between the Middle and North Forks of the Kings River.



Figure 30: The Roaring River, a tributary of the South Fork Kings River.

The forks of the Kings River converge in the Sequoia National Forest, a few miles outside the western boundary of the park, to form the main stem of the river. Here, the river forms one of the deepest canyons in North America, its walls rising as much as 8,200 feet (2,500 m) from river to rim – about half a mile (0.8 km) deeper than the Grand Canyon. The canyons upstream at Cedar Grove are also more than 5,000 feet (1,500 m) deep. Although the geology and topography of Cedar Grove and Tehipite Valley are similar to that of Yosemite Valley, the park does not have waterfalls as high and spectacular as those in Yosemite. There are several powerful but short waterfalls including Mist Falls, Roaring River Falls and Grizzly Falls in the Cedar Grove area. The backcountry is home to some much higher falls. Silver Spray Falls in Tehipite Valley drops about 700 feet (210 m) in several tiers. In a 1910 article in *Out West*, Ernestine Winchell describes the falls and Tehipite Valley:

... We paused a moment at the colossal doorway where Tehipite, shimmering through spaces of summer sunshine, in peaceful grandeur compelled our reverential gaze ... Across the river and below the dome Crown Creek races in sparkling cascades to grind a score of horrible pot-holes big enough to swallow a

horse and rider; leaves that ferocious task to foam lightly down a cliff as Silver Spray

Fall, whirls lazily at its foot, and then hurries to join King's River in its journey to the desert.

Both the Kings and San Joaquin Rivers flow west into the arid San Joaquin Valley; however, while the San Joaquin eventually empties into San Francisco Bay, the Kings ends in the terminal sink of Tulare Lake, which – before its waters were diverted for irrigation – was one of the largest freshwater lakes in the western United States. The seasonal rise and fall of the park's rivers is driven by heavy snowfall (typically between November and April) followed by a rapid melt during May and June. Runoff drops significantly by late July (or August in wet years), and rivers are usually a trickle by autumn. Snow accumulations in the higher areas of Kings Canyon National Park can be extremely large, often totaling in the hundreds of inches, although the annual snowpack fluctuates greatly between wet and dry years.

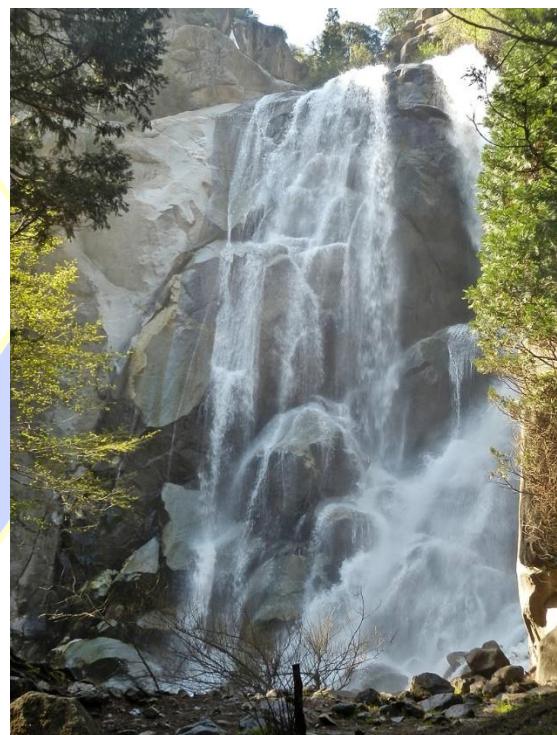


Figure 31: Grizzly Falls, near Cedar Grove.

Climate

Average Climate

According to the Köppen climate classification system, most of Kings Canyon National Park has a Warm-summer Mediterranean climate (Csb) with only the lowest of elevations having a Hot-summer Mediterranean climate (Csa). According to the United States Department of Agriculture, the Plant Hardiness zone at Cedar Grove Visitor Center at 4613 ft (1406 m) elevation is 8a with an average annual extreme minimum temperature of 12.3 °F (-10.9 °C).

| Climate data for Cedar Grove Visitor Center, Kings Canyon National Park. Elev: 4783 ft (1458 m) | | | | | | | | | | | | | | |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|------|
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | Year |
| Average high °F (°C) | 54.1 (12.3)) | 54.4 (12.4)) | 58.3 (14.6)) | 62.1 (16.7)) | 71.7 (22.1)) | 79.7 (26.5)) | 87.0 (30.6)) | 87.5 (30.8)) | 82.2 (27.9)) | 72.0 (22.2)) | 60.0 (15.6)) | 51.6 (10.9)) | 68.5 (20.3)) | |
| Daily mean °F (°C) | 40.6 (4.8)) | 41.3 (5.2)) | 44.5 (6.9)) | 48.5 (9.2)) | 56.0 (13.3)) | 63.3 (17.4)) | 71.4 (21.9)) | 71.3 (21.8)) | 64.1 (17.8)) | 55.1 (12.8)) | 45.6 (7.6)) | 38.4 (3.6)) | 53.4 (11.9)) | |
| Average low °F (°C) | 27.1 (-2.7)) | 28.1 (-2.2)) | 30.8 (-0.7)) | 34.9 (1.6)) | 40.3 (4.6)) | 46.9 (8.3)) | 55.8 (13.2)) | 55.0 (12.8)) | 46.1 (7.8)) | 38.2 (3.4)) | 31.2 (-0.4)) | 25.2 (-3.8)) | 38.4 (3.6)) | |
| Average <u>precipitation</u> in inches (mm) | 7.38 (187)) | 6.80 (173)) | 6.63 (168)) | 3.26 (83)) | 1.64 (42)) | 0.66 (17)) | 0.35 (8.9)) | 0.13 (3.3)) | 0.25 (6.4)) | 1.57 (40)) | 4.14 (105)) | 6.00 (152)) | 38.8 1 (986)) | |
| Average <u>relative humidity</u> (%) | 44.8 | 52.5 | 54.7 | 49.8 | 47.5 | 42.6 | 36.8 | 34.2 | 33.5 | 35.7 | 43.0 | 44.1 | 43.2 | |
| Average <u>dew point</u> °F (°C) | 20.8 (-6.2)) | 25.2 (-3.8)) | 29.2 (-1.6)) | 30.6 (-0.8)) | 36.3 (2.4)) | 40.2 (4.6)) | 43.6 (6.4)) | 41.6 (5.3)) | 34.8 (1.6)) | 28.4 (-2.0)) | 24.4 (-4.2)) | 18.4 (-7.6)) | 31.2 (-0.4)) | |
| Source: PRISM Climate Group l | | | | | | | | | | | | | | |
| www.prism.oregonstate.edu | | | | | | | | | | | | | | |

Fees & Passes

Park Entrance Fees

Entrance Fee by vehicle - 7-day permit

\$35.00 – Single

\$70.00 – Annual Pass

\$80.00 – Annual Pass (All Parks & Lands)

This is an 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, and the permit is valid for seven days and includes Sequoia & Kings Canyon National Parks and Hume Lake District of Sequoia National Forest/Giant Sequoia National Monument.

All park visitors are required to pay an entrance fee. Money collected must be used in ways that directly improve visitor experiences and assist with the cost of providing safe, meaningful experiences to park visitors. Entrance passes may be purchased at all the NPS Entrance Stations. Passes may also be purchased online then printed out for display before entering the park or displayed on a smart phone. Passes are non-transferable. Credit cards are preferred at all fee collection areas.

Buy Your Digital Pass on [Recreation.gov](#)

Whether you're planning a single visit or coming back multiple times a year, enjoy the convenience of purchasing a Sequoia & Kings Canyon Annual Pass on Recreation.gov before you arrive. You have immediate access to your digital pass and can easily download it on your phone or tablet. Your pass will also be emailed as a PDF and can be printed out for display when you arrive.

Backcountry Permits

Standard Permit Fee

\$10.00 + \$5.00 per person during the quota period

Wilderness permits are required for all overnight backpacking trips. Our quota system remains in place, limiting the number of people entering the wilderness each day, from each trailhead, in accordance with the parks' Wilderness Stewardship Plan. Day hiking does not require a wilderness permit. In order to comply with CDC guidelines and maintain social distancing, all wilderness permits will be issued remotely, by phone and email. Consequently, reservations are required in advance for all wilderness permits in the 2020 season. No walk-up permits will be issued. The Lakes Trail, previously walk-up permits only, is available for reservation with a limited quota.

Trips Starting Inside Sequoia & Kings Canyon National Parks

To protect the wilderness and preserve the wilderness experience for present and future generations, all overnight trips require a wilderness permit subject to daily entry quotas for each trail. Day hikes do not require a permit, except for Mount Whitney. Wilderness permits are only issued at the visitor center or permit station closest to the trailhead. The trail descriptions in the previous pages detail where permits can be obtained and the daily entry quota for each trail.

Inside the Quota Period

Daily entry quotas (the number of people who are allowed to start hiking on a trail each day) apply during the primary use season, which is established as the Friday before Memorial Day through the Saturday of September that falls between the 23rd and the 29th. During this time, each permit incurs a fee of \$10 per permit, plus \$5 per person regardless of length of trip.

Outside the Quota Period

From late September to the Thursday before Memorial Day weekend, permits are not limited by quotas. Wilderness permits are still required; they are self-issued at the visitor center or permit station closest to the trailhead and are free.

Permit Reservations

Reservations for wilderness permits are available for approximately two-thirds of each daily entry quota (except the Lakes Trail – toward Emerald and Pear Lakes – which cannot be reserved). Permit reservations are highly recommended for large groups, holiday weekends, and late summer weekends.

A Wilderness reservation confirmation letter is not a wilderness permit and cannot be used for overnight travel. Your confirmation letter will include details of where to pick up your permit. Permits are issued during normal operating hours by trailhead rangers who provide important area information. There are no “night drops.” You can pick up your wilderness permit on the afternoon prior to your hike date (after 1:00 pm) or by 9:00 am on the morning of your entry date. If you need to pick up your permit later than 9:00 am on the morning of your entry date, notify the Wilderness Office at (559) 565-3766 or seki_wilderness_office@nps.gov. If you do not make arrangements for a late pickup, your reservation may be cancelled at 9:00 am and your spots given to people waiting for walk-up permits.

The Wilderness Office receives a high volume of phone calls and e-mails. Please review this trip planner and our website prior to calling or sending an email about trip planning.

For the Rae Lakes Loop, you can obtain permits for these trails at Road's End Permit Station (located at the end of Hwy 180) in Kings Canyon. Typical Hours from Memorial Day weekend to mid-September: 7am to 3:30pm.

Walk-up/First-come, First-serve Permits

Approximately one-third of each quota is available on a first-come, first-serve basis at the station closest to the trailhead starting at 1 pm the day before departure, or on the day of departure (see pages 6, 7-11 for typical permit issuing hours or visit http://www.nps.gov/seki/planyourvisit/wilderness_permits.htm

For Trails Starting Outside Sequoia and Kings Canyon National Parks

Inyo National Forest

Inyo National Forest issues permits east of the parks. Most trails have quotas and reservations are accepted. Popular trails into the parks include: Piute Pass, Bishop Pass, Taboose Pass, Sawmill Pass, Baxter Pass, Kearsarge Pass, Shepherd Pass, Trail Crest (Mount Whitney), Cottonwood Lakes, and Cottonwood Pass. For reservations, go to www.recreation.gov. For more information contact the Inyo National Forest Wilderness Office at (760) 873-2483, or the Eastern Sierra Interagency Visitor Center at (760) 876-6222, or visit <http://www.fs.usda.gov/inyo>.

Sequoia National Forest

Sequoia NP issues permits to the south and west of the parks, has no quotas, and only requires wilderness permits for the Golden Trout Wilderness (not for the Jennie Lakes Wilderness). Fire permits are required for campfires and camp stoves and can be obtained online at www.preventwildfireca.org. Common trails into the parks from the Golden Trout Wilderness include Forks of the Kern, Jerky, Fish Creek, Clicks, Summit, and Long Canyon. For more information contact Sequoia National Forest (559) 784-1500 or visit www.fs.usda.gov/sequoia.

Sierra National Forest

Sierra NP issues permits to the north and west of the parks. Quotas exist and reservations are accepted. Common trails into the parks include Crown/Rancheria, Courtright, Deer Cove, Florence, and Mono Creek. For more information contact Sierra National Forest at (559) 855-5360 or visit www.fs.usda.gov/sierra.

Permit Process

Step 1: Fill out and email the application form.

Download and fill out the [Wilderness Permit Application](http://www.nps.gov/seki/planyourvisit/wilderness_permits.htm) form electronically. Email it as an attachment to seki_wilderness_reservations@nps.gov. Please include a daytime phone number to avoid delays with your reservation. Use the trailhead list in the planning section to find trailhead names. Only one application is needed per group. (Duplicate applications may result in duplicate, non-refundable charges.) To reserve more than one trip, fill out a separate application for each trip.

Step 2: Payment of the \$10 per permit, plus \$5 per person wilderness camping fee will be through Pay.Gov.

Upon completion of your booking the park will email you a link to our Pay.Gov payment form. In the email you will be given a permit ID number that you will use to pay for your reservation. Payment can be made by credit or debit card, bank account (ACH), Amazon, Dwolla, or PayPal account. The fee is not refundable, not transferable to other parties or future years, and not for re-sale. You will have 10 days from receipt of the link to complete payment or your reservation will be cancelled.

Step 3: Read and print your Pay.Gov confirmation letter.

The Wilderness Office processes applications in the order they are received. Applications received prior to 12:01am March 1 will not be processed. All applicants will receive an email response within two weeks.

Step 4: Bring your Pay.Gov confirmation letter to pick up your wilderness permit at the start of your trip.

Your confirmation letter is not a wilderness permit and cannot be used for overnight travel. Your confirmation letter will include details of where to pick up your permit. Permits are issued during normal operating hours by trailhead rangers who provide important area information. There are no "night drops." You can pick up your wilderness permit on the afternoon prior to your hike date (after 1:00) or by 9:00 am on the morning of your entry date. If you need to pick up your permit later than 9:00 am on the morning of your entry date, notify the Wilderness Office at (559-565-3766 or seki_wilderness_office@nps.gov) Do not submit application to this email address.) If you do not make arrangements for a late pickup, your reservation will be cancelled at 9:00 am and your spots may be given to people waiting for walk-up permits.

Can I make changes to my trip after my application is processed?

Changes to the entry date or trailhead and increases in group size must be made at least two weeks before your entry date. To have a fair process for allocating space that has become available due to cancellations, party size reductions, and not issuing walk up permits we are asking existing reservation holders to submit changes (to dates, party size, or trailhead) by email to seki_wilderness_reservations@nps.gov. Please include your current reservation number and the change that you would like to make. Additional people will incur an additional \$5/person fee but can only be increased if quota space is available and must be paid for over the phone ahead of time. Changes to reduce group size can be made at any time with no additional cost. Once processed, fees are not refundable.

Contact Information

Mailing Address

Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, CA 93271-9700

Park Information

(559) 565-3341

Website

www.nps.gov/seki

Emergencies

911 or

Park Dispatch: 
(559) 565-3195

Trip Planning

Traveling into the wilderness, even on short trips, can be challenging and risky and requires careful planning before you begin. Over 95% of these parks is designated as wilderness. Here you can climb the highest peaks and see some of the most rugged country in our national parks. Each year, people are injured or die while exploring the backcountry. Your safety depends on your own good judgment, adequate preparation, and constant observation. Speak with park rangers at park visitor centers or visit park internet sites links for current conditions, weather forecasts, and lightning storm potential ratings.

- Take action to ensure that your group is self-reliant and aware of the risks involved with backpacking in the Sequoia & Kings Canyon Wilderness.
- Be aware of the weather and the flash flood potential rating. Continuously evaluate the weather and adjust plans to keep you and your group safe. Have a back-up plan.
- Have a route description, map, compass, and the ability to use them.
- Familiarize yourself with the water sources in Kings Canyon. Carry enough water, one gallon per person per day, and drink it. Do not drink untreated water.
- Plan your wilderness transportation to and from the trailhead.
- Everyone in the group should have the proper equipment, skill level, and physical ability to successfully complete each overnight trip.
- Know that rescue is not a certainty. Your safety is your responsibility.

Seasons

SPRING

Depending on the elevation, spring in these parks generally lasts from April to mid-June. Sequoia groves are often still snowy at this time of year, though snow begins

melting at most elevations. Late spring snowstorms are common, and it's a good idea to check weather forecasts before you visit. Tire chains may still be required along park roads at this time of year. Rivers and creeks become especially swift, cold, and dangerous. Spring brings warm weather and abundant wildflowers to the foothills.

SUMMER

Most people who travel to these parks come in summer. Temperatures in the sequoia groves are comfortable and offer a break from the heat in the foothills. Reservations are strongly recommended for summer camping and lodging.

FALL

Beginning in September, weather usually begins to cool at night, though days may still be warm. The weather changes quickly, with hot days followed by stormy days. Light snows that melt quickly may begin in late October. Facilities begin to reduce hours or close, and fewer ranger programs take place. The Mineral King and Cedar Grove areas close for the snowy season.

WINTER

When it begins to snow, sequoia groves are snowy, peaceful, and cold, and rangers offer free outdoor activities. The timing of our snowfall varies widely and can be difficult to predict. Tire chains can be required along park roads at any time. In the foothills, temperatures are cool and ideal for hiking. Hillsides are green and decked with wildflowers starting as early as January. Solitude is abundant.

Activities

What activities you will engage in will decide how you will need to prepare. Here is a list of activities required for this trip and a list of possible activities if you should choose to do so:

Required Activities

- Long Distance Hiking

- Overnight Camping
- Stream/River Crossing

Winter Related Activities

- Long Distance Hiking
- Overnight Camping
- Stream/River Crossing
- Snow Shoeing
- Traversing Over Ice

Optional Activities

- Mountaineering

Route Planning

From oak woodlands to granite peaks, the trails of Sequoia and Kings Canyon National Parks offer many wilderness travel options for any season. Snowshoes or skis make winter travel easier and good hiking boots usually suffice for the rest of the year. Within the parks, trails start from five major geographic areas: Cedar Grove/Roads End, Grant Grove, Lodgepole/Giant Forest, Foothills (Middle, South, and North Fork of the Kaweah River), and the Mineral King area. Trails also enter the parks from Inyo National Forest to the east, Sequoia National Forest to the south and west, and Sierra National Forest to the north and west. The trails described in this planner are merely the beginnings of an extensive network. Nearly 750 miles of maintained trails plus endless cross-country routes wind through the parks. Be sure to grab a detailed map and plan to take a day, a week, or a lifetime to explore.

For the purpose of this loadout we will primarily focus on the Rae Lakes Loop trail which is in the Cedar Grove and Monarch Divide region of the park.

Cedar Grove & Monarch Divide Area

You may encounter "Drift Fences" in the wilderness. These fences are utilized to keep stock (horses, mules, and llamas) from roaming freely or impacting ecologically sensitive areas. Each fence has either a sliding pole or swinging gate across the trail for visitors to pass through. Please close all gates behind you to protect wilderness resources.

Wilderness permits for the following trails are only issued from the Road's End Permit Station.

Bubb's Creek Trail: Begins at Road's End. Steep then steady grade. Access to John Muir/Pacific Crest Trails. Southern leg of the Rae Lakes Loop (entry trail if doing the loop counterclockwise). First allowed campsite - Sphinx Creek Junction (4 miles).

Woods Creek Trail: Begins at Road's End. Steady moderate climb. Very busy trail. Vistas, rivers, and high lakes. Access to JMT/PCT. Northern leg of the Rae Lakes Loop (entry trail if doing the loop clockwise). First allowed campsite - Paradise Valley (6.5 miles). Designated sites may be required in Paradise Valley- confirm with Road's End Permit Station.

Copper Creek Trail: Begins at Road's End. Hot, steep climb; leave early in the day or late in the evening. Forests, vistas, alpine lakes. Access to Middle Fork of the Kings River. First allowed campsite - Lower Tent Meadow (4 miles).

Lewis Creek Trail: Begins at the Lewis Creek Trailhead. Hot, steep, dusty climb. Trail becomes difficult to follow north of Kennedy Pass. Forest, lakes, and vistas. First allowed campsite - Frypan Meadow (5.5 miles).

Woods Creek Trail

Distance

31.2-mile trail starting at the Bubbs Creek trail junction 1.8 miles from Roads End and ends when it connects back with the Bubbs Creek Trail.

Elevation Change

9,100 feet

Water Sources

Roads End/South Fork Kings River/Woods Creek

Season

Late Spring, Summer, Fall

Seasonal Conditions

Seasonal rain/snow may cause trail to be muddy or snow covered. Snow melt can continue well into summer, making trails wet and muddy.

Trailheads

Roads End Trailhead, Cedar Grove

Other trails accessible by Woods Creek Trail are Bubbs Creek, John Muir/PCT, Rae Lakes Loop.

Description

Leaves from Road's End. Start of the very popular Rae Lakes Loop, in the easier clockwise direction. Dramatic and diverse. Steady, moderate climb. Access to the JMT/PCT. Two-night camping limit for Paradise Valley, Charlotte Lake, Kearsarge Lakes, and one-night camping limit per lake in the Rae Lakes area (from Dollar Lake to Glen Pass). No campfires above 10,000 ft. Animal-resistant food-storage containers required. Popular trail with many people at any given time.

Camping Options

Campsites at 6.5 miles, 8.0 miles, 9.5 miles, 13.4 miles, 15.7 miles, 17.0 miles, 18.2 miles, 18.7 miles, 19.8 miles, 20.5 miles, 22 miles, 23.8 miles, and 25.6 miles.

Bubbs Creek Trail

Distance

17.1-mile trail starting at the Roads End trailhead.

Elevation Change

7,355 feet

Water Sources

Roads End/South Fork Kings River/Bubbs Creek

Season

Late Spring, Summer, Fall

Seasonal Conditions

Seasonal rain/snow may cause trail to be muddy or snow covered. Snow melt can continue well into summer, making trails wet and muddy.

Trailheads

Roads End Trailhead, Cedar Grove

Other trails accessible by Bubbs Creek Trail are Woods Creek, John Muir/PCT, Rae Lakes Loop.

Description

Leaves from Road's End. Start of the popular Rae Lakes Loop, in the more strenuous counterclockwise direction. Dramatic and diverse. Steep and strenuous to Sphinx Creek, then steady and moderate climb. Access to East Lake at Junction meadow. Access to the JMT/PCT at Vidette Meadow. Two-night camping limit at Charlotte Lake, Kearsarge Lakes, and one-night camping limit at each lake in the Rae Lakes area. No campfires above 10,000 ft. Animal-resistant food-storage containers required. Popular trail with many people at any given time.

Camping Options

Campsites at 4.0 miles, 9.7 miles, 12.6 miles, 13.6 miles, 15.0 miles, 15.7 miles, and 17.1 miles.

Lewis Creek Trail

Distance

9.5-mile trail starting at CA 180 near the Lewis Creek parking area and ending at Kennedy Pass.

Elevation Change

6,810 feet

Water Sources

Lewis Creek, Comb Creek

Season

Late Spring, Summer, Fall

Seasonal Conditions

Seasonal rain/snow may cause trail to be muddy or snow covered. Snow melt can continue well into summer, making trails wet and muddy.

Trailheads

Cedar Grove near the Lewis Creek parking area.

Other trails and areas accessible are Frypan Meadow, Kennedy Pass.

Description

Leaves from Lewis Creek. Hot, strenuously steep, few people. Plan to start early in the day. Access to Grizzly Lakes, Kennedy Lakes, and Kennedy Canyon. Trail through

Kennedy Canyon is faint and should be treated as a cross-country route. The Lewis Creek drainage showcases recent fire ecology. No campfires above 10,000 ft.

Camping Options

Campsites at 4.0 miles, and 6.2 miles.

Copper Creek Trail

Distance

10.0-mile trail starting at the Roads End trailhead.

Elevation Change

5,862 feet

Water Sources

Copper Creek, Granite Lake

Season

Late Spring, Summer, Fall

Seasonal Conditions

Seasonal rain/snow may cause trail to be muddy or snow covered. Snow melt can continue well into summer, making trails wet and muddy.

Trailheads

Roads End Trailhead, Cedar Grove

Access to Granite Basin and Lake.

Description

Leaves from Road's End. Hot and steep. Plan to start early in the day. Access to Granite Basin, Granite Lake, Volcanic Lakes, State Lakes, and Middle Fork of the Kings River. No campfires in Granite Basin or above 10,000 ft.

Camping Options

Campsites at 4.4 miles, and 10.0 miles.

EXTENDED TRIPS

Rae Lakes Loop

Begins at Road's End. 41-mile Loop. Canyon views, high alpine lakes, vistas.

Distance

43.6-mile loop starting at Roads End

Elevation Change

10,050 feet

Water Sources

Roads End/South Fork Kings River/Woods Creek/Bubbs Creek

Season

Late Spring, Summer, Fall

Seasonal Conditions

Seasonal rain/snow may cause trail to be muddy or snow covered. Snow melt can continue well into summer, making trails wet and muddy.

Trailheads/Access To

Roads End Trailhead, Cedar Grove

Other trails accessible are the John Muir/PCT trails and the Upper Bubbs Creek trail as well as Kearsarge Pass.

Description

The Rae Lakes Loop is one of the most popular hikes in Sequoia and Kings Canyon, if not in the entire Sierra. If you are planning to do this hike during the summer, it is wise to make reservations, as trailhead quotas often fill up. Wilderness permits for the Rae Lakes Loop are issued at the Roads End station, 5.5 miles beyond Cedar Grove. Even if you have a reservation, you must still check in and pick up your permit prior to starting your trip.

The loop is 41.4 miles long, and climbs from 5035' (1535m) at the trailhead to 11,978' (3651m) at Glen Pass. High water at stream crossings can be a problem in May and early June. Glen Pass may be impassable to hikers until mid-late July and even later for stock. Because this is such a popular hike, there are certain restrictions along this trail:

- Camping in Lower Paradise Valley is permitted only in designated campsites. (See temporary closure)
- Camping in Paradise Valley is limited to two nights.

- Camping at Rae Lakes is limited to one night per lake.
- Camping at Charlotte Lake is limited to two nights.
- Bullfrog Lake, east of the trail between Vidette Meadow and Glen Pass, is closed to all camping, grazing and stock travel.
- There is a two night camping limit at Kearsarge Lakes (east of Bullfrog).
- Campfires are prohibited above 10,000' (3048m).
- Bears have been very active along this trail and were successful at getting food that was hung in trees. Hikers are required to carry portable bear-resistant canisters which are available for sale or rent at several locations in the parks, or from US Forest Service offices located in Lone Pine and Bishop. This has proved very successful at preventing bears from accessing food. (The permanent metal food-storage boxes are only for use by thru-hikers on the Pacific Crest Trail and John Muir Trail.).

Camping Options

Camping is permitted in designated sites with bear boxes and pit toilets provided. Campsites at 6.5 miles, 8.0 miles, 9.5 miles, 13.4 miles, 15.7 miles, 17.0 miles, 18.2 miles, 18.7 miles, 19.8 miles, 20.5 miles, 22 miles, 23.8 miles, 25.6 miles, 31.1 miles, and 37.5 miles.

Estimated Travel Times

As you plan your day to day you will want to get an estimate on how long it will take you to hike from point A to point B. You will never be truly accurate because of the all the factors that affect your pace (amount of weight carried, your physical conditioning, trail condition, elevation gain/loss, etc.), but your estimates will get better as you will begin to understand your limitations over time. A good source for getting as much information about the trail are guidebooks.

In order to help you calculate and estimate of your travel time, here is a general formula as presented by Rick Curtis

in his book "The Backpackers Field Manual". Remember that this is only an estimate of what you will do.

General Travel Time Guidelines

- **Average Speed** – The average hiking speed with all your gear on flat terrain is typically 30 minutes per mile or 2 mph. You can adjust the formula if you know your average speed to be faster or slower.
- **Ascent Adjustment** – Add 1 hour for each 1,000 feet of ascent.
- **Rest Adjustment** – Plan for about 5 minutes of rest for each hour of hiking. The more people you have, the more rest stops, bathroom breaks, photo ops, and equipment adjustments there will be, so adjust accordingly.

Calculating Miles per Hour

The basic formula for this is to divide the number of miles hiked (x) by 2. Then calculate the total elevation gain (y) in feet and divide that number by 1000. Next you want to take the total hours traveled and add your rest adjustment (z) for every hour.

$x = \text{total distance traveled in miles}$

$y = \text{total elevation gain in feet}$

$z = \text{total time of rest per hour in minutes}$

$$\begin{aligned} \text{Travel Time} = & \left(\frac{X \text{ mi.}}{2 \frac{\text{mi.}}{\text{hr.}}} \right) + \left(\frac{Y \text{ ft.}}{1000 \text{ ft.}} \right) \\ & + \left\{ \left(\frac{Z \text{ min.}}{60 \frac{\text{min.}}{\text{hr.}}} \right) \right. \\ & \times \left. \left[\left(\frac{X \text{ mi.}}{2 \frac{\text{mi.}}{\text{hr.}}} \right) + \left(\frac{Y \text{ ft.}}{1000 \text{ ft.}} \right) \right] \right\} \end{aligned}$$

Example: A group hikes for 8 miles per day with an ascent of 2000 feet per day with a plan to rest 5 minutes for every hour. The estimated travel time would be:

$$\begin{aligned}
 & \left(\frac{8 \text{ mi.}}{2 \frac{\text{mi.}}{\text{hr.}}} \right) + \left(\frac{2000 \text{ ft.}}{1000 \text{ ft.}} \right) \\
 & + \left\{ \left(\frac{5 \text{ min.}}{60 \frac{\text{min.}}{\text{hr.}}} \right) \right. \\
 & \times \left. \left[\left(\frac{8 \text{ mi.}}{2 \frac{\text{mi.}}{\text{hr.}}} \right) + \left(\frac{2000 \text{ ft.}}{1000 \text{ ft.}} \right) \right] \right\} \\
 = & 6.498 \text{ hrs.} \approx 6.5 \text{ hours}
 \end{aligned}$$

Check for Updates

Check the [Backcountry Updates and Closures page](#) for current information on trail conditions and situations affecting the backcountry.

<https://www.nps.gov/seki/planyourvisit/trailcond.htm>

Also check the weather and road conditions for any relevant conditions that may affect your trip:

Weather

<https://www.nps.gov/seki/planyourvisit/weather.htm>

Park Conditions

<https://www.nps.gov/seki/planyourvisit/conditions.htm>

Be Realistic

- Choose the appropriate trail for your abilities or consider walking the Rim Trail for an easier hike.
- Check the weather and adjust plans; avoid summer heat. Remember the weather can change suddenly.
- Leave your itinerary with someone who will notice if you are overdue and report it to 911.
- Hydrate, but don't force fluids. Eat a good meal, and get a good night's sleep. If you do not feel well, do not hike.

- Prepare yourself for a faster hike down with high impact on your joints and a slow, strenuous hike out that may take twice as long or longer.

Water Sources

Carry enough water, one gallon per person per day, and drink it. Do not drink untreated water. Plan ahead and prepare, your safety is your responsibility.

Potable Drinking Water Availability in Kings Canyon

- Roads End station

Rivers, Creeks, and Washes

There are many perennial, intermittent, and ephemeral streams throughout Kings Canyon. Water obtained from these rivers, creeks, and washes should always be properly treated.

Springs and Seeps

A spring is a place where water naturally flows out of the ground. Water flow magnitude at natural springs can vary throughout the park and may not always be reliable.

- Never drink untreated spring water.
- Springs should be used as an emergency source for water, not as a primary source.
- Overnight camping is not permitted within a $\frac{1}{4}$ mile of any spring.

Water Treatment

CDC Guide to Water Treatment for Backcountry & Travel Use:

https://www.cdc.gov/healthywater/drinking/travel/backcountry_water_treatment.html

Water collected in the Kings Canyon Wilderness is not safe to drink without proper treatment. Except for boiling, few water treatment methods are 100% effective in removing all pathogens.

Boiling can be used as a pathogen reduction method that should kill all pathogens. For most elevations in Zion, water should be brought to a rolling boil for 3 minutes.

Filtration can be used as a pathogen reduction method against most microorganisms. Manufacturer's instructions must be followed.

Disinfection can be used as a pathogen reduction method against microorganisms. However many factors can impact the effectiveness of chemical disinfection. The length of time and concentration of disinfectant varies by manufacturer and effectiveness of pathogen reduction depends on the product. 100% effectiveness may not be achieved.

If boiling water is not possible, a combination of filtration and chemical disinfection is the most effective treatment method for drinking water in the Kings Canyon Wilderness.

Water Availability in the Rae Lakes Loop Wilderness

Woods Creek Trail

- South Fork Kings River
- Woods Creek
- Rae Lakes

Bubbs Creek

- Bubbs Creek
- South Fork Kings River

Travel Logistics

The Sequoia Shuttle

The Sequoia Shuttle, operating all summer long, is the perfect way to get to the Sequoia National Park. The shuttle departs from various convenient locations throughout Visalia, Exeter, Three Rivers, and Lemon Cove, Ca. several times a day, seven days a week. Reservations are required and round-trip tickets are only \$20, this includes unlimited shuttle service inside the park.

<https://www.sequoiashuttle.com/>

Big Stump Entrance to Kings Canyon National Park

Highway 180 enters Kings Canyon National Park from the west via Fresno. Highway 180, the northern entrance to

these parks, is the preferred route for these longer vehicles. Highway 180 is straighter, less steep, and wider.

Equipment

10 Essentials for Your Day Pack

1. Water: bring a sufficient amount and extra in case of emergency; always bring a water treatment method
2. Salty snacks and high-calorie meal(s)
3. First aid kit, prescriptions, blister care, duct tape, and pocketknife
4. Map or trail guide
5. Flashlight or headlamp with spare batteries
6. Sunscreen, wide-brimmed hat, and sunglasses
7. Whistle, signal mirror, and cell phone
8. Lightweight tarp or emergency shelter
9. Broken-in hiking shoes with good soles and hiking poles
10. Layers of clothing

Overnight Essentials

Below is a list of basic equipment needs for this trip. You will find a more in-depth list in the Gear Essentials section of this report.

Required Activities

- **Long Distance Hiking**
 - Hiking Shoes
 - Trekking Poles
 - Navigation
- **Overnight Camping**
 - Pack
 - Shelter
 - Sleep System
 - Bear Canister
- **Stream Crossing**
 - Water Crossing Shoes

Winter Related Activities

- **Long Distance Hiking**
 - Hiking Shoes

- Trekking Poles
- Navigation
- **Overnight Camping**
 - Pack
 - 4 Season Shelter
 - 15 Degree Rated Sleep System
 - Bear Canister
- **Stream Crossing**
 - Water Crossing Shoes
- **Snow Shoeing**
 - Snow Shoes
- **Traversing Over Ice**
 - Traction

Optional Activities

- **Mountaineering**
 - Technical Climbing Gear
 - Mountaineering Safety Gear

Meal Planning

You should plan to have enough food for the duration of your time in the backcountry with enough nutrition to keep you at full capacity. It is important to have food that is both nourishing and edible. On long trips, with specialized activities, or in different climates, it may be

necessary to plan a menu that supplies a specific number of calories per day and stresses certain food groups over others.

The Rae Lakes Loop Trail requires 5 days and 4 nights to complete. We usually plan for a hot meal in the morning, a hot meal in the evening and snacks throughout the day. So your meal plan may look as follows:

| MEAL PLAN | | | |
|-----------|-----------|--------|--------|
| Meal Type | Breakfast | Dinner | Snacks |
| # of Days | 4 | 4 | 5 |

Skill Development

Based on the activities planned there may be certain skill sets that are needed to successfully complete this trip. Ensure that you have the base knowledge you need in order to give yourself the best experience. If you find yourself lacking then take the time to educate yourself. For instance if you plan on canyoneering but have never done so in the past you should schedule a training program with a local outfitter. If you lack the basics in backcountry skills, AcadianX now offers a training program known as AcadianXU that will ensure you possess all the base knowledge you need.

Regulations and Safety

Backcountry Regulations

It is the responsibility of a backcountry permit trip leader to insure that all participants know and obey the following regulations. The trip leader and/or participants can be cited for violating these regulations.

GENERAL TRAVEL REQUIREMENTS

1. Wilderness permits are required for all overnight travel. A signed permit must be in the team leader's possession and must be presented to an authorized person upon request.
2. To prevent erosion and preserve vegetation, do not shortcut trails.
3. Do not build rock cairns or other trail markers.
4. Pets are not allowed in the wilderness.
5. Pack out all trash including toilet paper.
6. All wheeled vehicles and all motorized equipment are prohibited in the wilderness per the Wilderness Act of 1964.
7. Discharge of any firearm or weapon is prohibited. Possession of weapons, including bear spray, is prohibited. The possession of firearms is subject to state regulations.
8. You may encounter "Drift Fences" in the wilderness. These fences are utilized to keep stock (horses, mules, and llamas) from roaming freely or impacting ecologically sensitive areas. Each fence has either a sliding pole or swinging gate across the trail for visitors to pass through. Please close all gates behind you to protect wilderness resources.

PARTY SIZE LIMITS

1. Maximum party size is 15 people on trail; 12 people off trail, except in Redwood Canyon,

where groups are limited to 10 people and in these specific areas where the limit is 8 people off trail: Colony Mill Road Trail; Darwin Canyon/Lamarck Col (includes Class 1 trail area); Don Cecil Trail; Dusy Basin; Mt. Whitney Management Area/Mt. Langley (includes Class 1 trail area); Sixty Lake Basin; and Sphinx Lakes.

2. "Off trail" is 1/2 mile from a maintained trail for overnight use, and 100 yards from a maintained trail for day use areas.
3. Affiliated groups may not travel or camp within 1/2 mile of each other if the total group size exceeds the limits described above.
4. If you will be day hiking there is a maximum party size of 25 people.

CAMP SITE SELECTION

1. No camping within 25 feet of water. From 25 to 100 feet from water, camping is only allowed in previously established campsites.
2. Camp on durable surfaces (rock, sand, dirt, snow, etc.) or in designated campsites. Do not camp on vegetation or in meadows.
3. Do not construct rock walls, trenches, new fire rings (or add rocks to existing fire rings), bough beds, camp furniture, etc.
4. Do not camp before reaching the first camping area for your specific trailhead.
5. Do not camp under leaning trees or dead branches.

AREA SPECIFIC CAMPING RESTRICTIONS

1. The Lakes Trail: No camping at Aster or Heather Lake. Camp only in designated sites at Pear and Emerald Lakes. Three night limit (combined).
2. High Sierra Trail: Camp only in designated sites at Bearpaw meadow. One night camping limit at Hamilton Lakes.
3. Redwood Canyon, the Don Cecil Trail, Dusy Basin (basin wide), and North Dome, have a two night camping limit.

4. Eagle/Mosquito Trails: No camping between the trail and Eagle Lake. No camping within 1/4 mile of first Mosquito Lake.
5. Atwell/Hockett: No camping between the trail and Whitman Creek.
6. Columbine Lake: No camping within 100 feet of the lake.
7. The Rae Lakes Loop Area: Camp only in designated sites in Lower Paradise Valley. (See temporary closure above) Two night camping limit in Paradise Valley. One night camping limit per lake between Dollar Lake and Glen Pass. No camping within a 1/4 mile of Bullfrog Lake. Two night camping limit at Charlotte and Kearsarge Lakes and along the John Muir Trail from Woods Creek Crossing to Vidette Meadow.
8. Mt. Whitney/Crabtree Area: No camping at Timberline Lake. Three night camping limit at lower and upper Soldier Lakes. Two night camping limit at Crabtree/Whitney Creek area and Guitar Lake.

SANITATION

1. Human waste must be buried at least 6 inches deep and 100 feet from trails, camps, and all water sources. Pack out used toilet paper.
2. All soap, including biodegradable soap, should be used and disposed of away from water sources. Carry water 100 feet from the source before washing. This includes washing clothes, dishes, and yourself.

FISHING REGULATIONS

1. A California fishing license is required. Below 9,000 feet elevation, native species (Rainbow Trout, Sacramento Sucker, Kern Rainbow, Sculpin, and Roach) must be released and only barbless artificial flies or lures are authorized. State regulations apply above 9,000 feet.

ADDITIONAL SAFETY RECOMMENDATIONS

2. Wilderness is a place where self-reliance and preparedness is essential. Be prepared for a wide variety of hazardous situations.
3. Most wilderness illnesses are attributable to poor hygiene. Wash your hands often.

4. We recommend that you boil, treat, or filter drinking water.

FOOD STORAGE RESTRICTIONS

1. Properly store food items when not in use to prevent bears and other wildlife from becoming conditioned to human food. Report any wildlife-related injuries, property damage or unusual encounters to a ranger.
2. Food items include: any food meant for human or pack stock consumption; food-tainted garbage, recyclables, and trash, such empty can, bottles, or food wrappers; any equipment with food residue or odor; toiletries such as soap, toothpaste, ointments, and lotions.
3. The only proper food storage methods are: using an [allowed portable animal-resistant food-storage container](#); using a permanent animal-resistant food-storage box; or using the [counter-balance](#) hanging technique. When camping in an area with out food-storage boxes or adequate trees for hanging food, you must carry a park approved animal-resistant food-storage container.
4. Allowed animal-resistant food-storage containers are required in the following areas: North Dome, Rae Lakes loop (including the Woods Creek drainage south from Pinchot Pass, the Bubbs Creek drainage north of Forester Pass, and the Kearsarge Lakes area), Dusy Basin/Bishop Pass corridor, Rock Creek Drainage, and many Inyo National Forest trails.
5. Food-Storage boxes are for immediate on-site use only. Caching food or gear within food-storage boxes is prohibited.
6. All food items must be removed form your car and stored in the food-storage boxes at the trailhead including containers such as ice chest unless they are completely empty and free of all food residue.

CAMPFIRE RESTRICTIONS

1. Note that during times of high fire danger, additional campfire restrictions may be implemented. Campfire restrictions also apply to

- the use of wood-burning camp stoves (e.g. Biolite or "Zip stoves").
2. In Kings Canyon National Park campfires are not allowed above 10,000 feet. In addition, fires are prohibited in Granite Basin and Redwood Canyon.
 3. In Sequoia National Park west of the Great Western Divide campfires are not allowed above 9,000 feet. East of the Great Western Divide fires are not allowed above 10,000 feet. In addition, fires are prohibited at Pinto Lake, Summit Lake Basin, Hamilton Lakes Basin, the Dillonwood area, and the Mineral King Valley above the ranger station.
 4. Where campfires are allowed, use existing fire rings. Do not build new ones or add rocks to existing fire rings.
 5. Use only dead or down wood found on the ground. Do not chop live vegetation or remove dead branches from standing trees.
 6. Fires must be attended at all times.
 7. Do not burn trash.(this includes plastic and foil).
 8. Put out fires with water 1/2 hour before leaving your campsite and stir the ashes.

SEARCH AND RESCUE POLICY

Search and rescue actions are conducted on a discretionary basis. The level and necessity and of the response is determined through evaluation of the situation by field personnel. Rescuer safety is always the first priority of rescue crews. These parks expect visitors to exhibit a high degree of self-reliance and responsibility for their own safety commensurate with the difficulty of their chosen activities. The higher risk the activity the more you need to be prepared for dealing with emergency situations.

If you chose to carry a hand-held electronic signaling device, be familiar with its operation, limitations, and frequency of failure to transmit. Do not rely on it to summon rescue personnel or notify family that you are "OK."

If you find yourself in a true emergency, and have exhausted all means of self-rescue/help contact a ranger in the field or call **Park Dispatch at (559) 565-3195**. There

is little to no cell reception in most areas of these parks. When you make contact provide clear, concise, information regarding the nature and exact location of the problem or injury as well as the number of people involved. Be aware that help may be several days out. Be prepared to help yourself.

Overnight Camping (Etiquette)

"At-large" camping is allowed in Wildcat Canyon and on the East Rim. Follow these guidelines when camping overnight.

Prepare: Plan Ahead

- Backpackers planning to camp overnight must obtain a backcountry permit before starting their hike Attach the permit visibly to your backpack. Camp only in campgrounds, not along the trail. No campfires allowed.
- In addition to the 10 essentials listed above, bring a stove, fuel, and matches; blanket or sleeping bag with ground pad; and ground cloth, tarp, or tent.
- Pack weight should not be more than 15–20% of your body weight. In summer, pack light—replace your sleeping bag with a liner or sheet; bring ready-to-eat foods and leave the stove behind.

While at Camp

- Choose your campsite. Sites are first-come, first-served with the required permit. Large group sites are reserved for parties of 7–11 hikers.
- Immediately place all food, toiletries, and plastic bags and keep away from rodents and small mammals.
- Keep your backcountry permit with you at all times. If approached by park rangers be prepared to produce it for them.
- Use headlamps with red lights to preserve your night vision, minimize light pollution, and avoid disturbing other campers.

When Leaving Camp

- If you start early, remember to maintain a quiet camp and let fellow campers sleep.
- Do not leave any trash, gear, or extra food behind. Check your site for micro-trash —look for bandages, twist ties, fruit peels, etc.



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

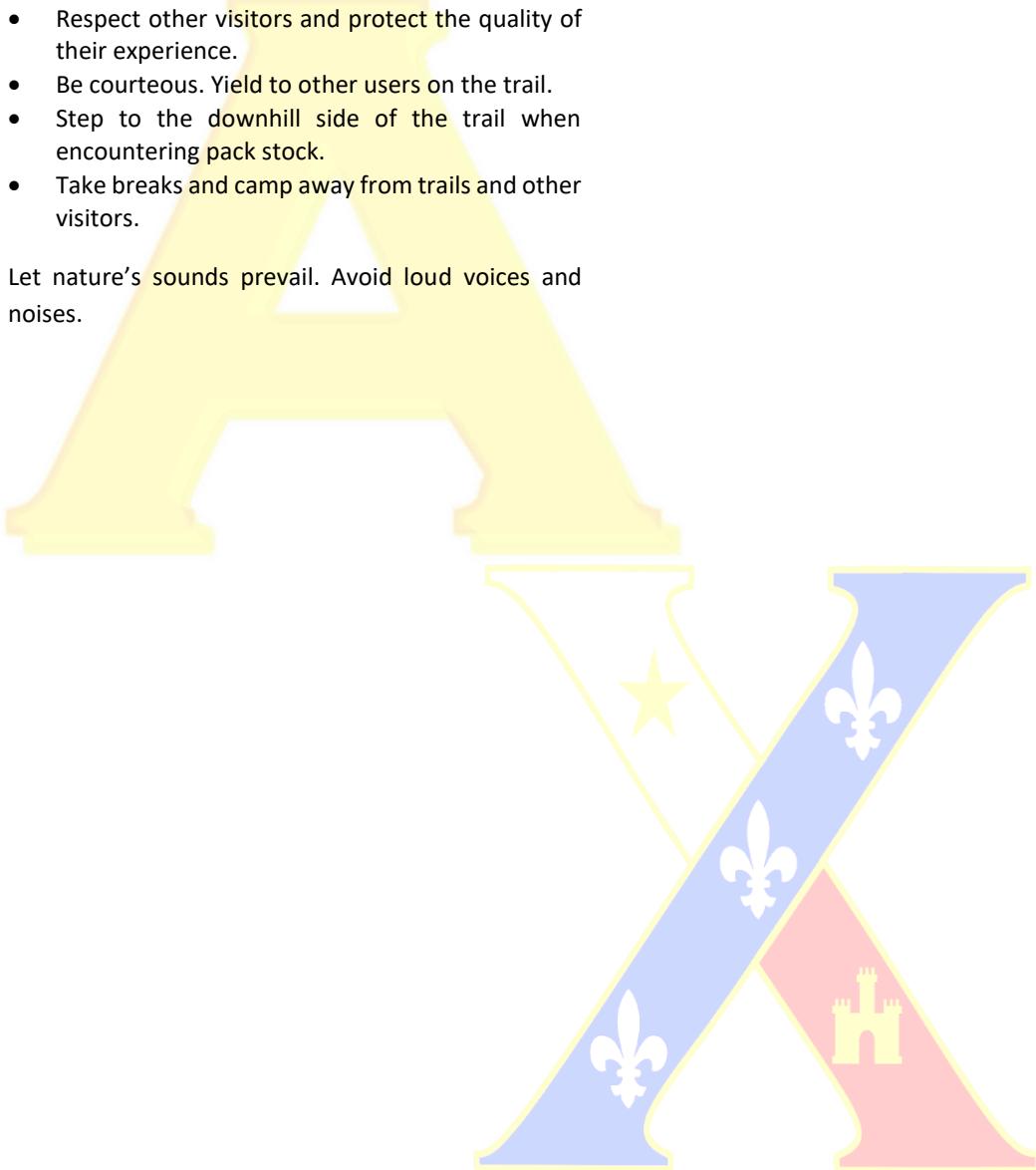
- Avoid introducing or transporting non-native species.

- 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.



Backcountry Safety

Whether you're taking a short day hike through sequoia groves, or you're on a challenging, extended backpacking trip in the high Sierra, the exhilaration and empowerment you experience is partly due to the unpredictable nature of your trip. Yet, predicting potential safety obstacles before your trip will make for a much more enjoyable experience.

Both day hikes and multi-day backpacking trips require preparation. Clear blue skies may start the day, but weather conditions can change quickly. By midmorning, you may find yourself wrapped in a strong wind, with dark clouds on the horizon. Wilderness travel requires self-reliance, mental and physical strength, and thorough preparation. Make sure you're ready for anything this wild environment might send your way.

Wildlife Hazards

You will encounter wildlife while in the wilderness. Be aware that wild animals can be unpredictable. Do not approach or attempt to move sick or injured wildlife. Please report any encounters with aggressive, sick, or injured animals to a park ranger.

Please keep all animals wild and healthy by viewing them from a safe distance. Do not feed or touch wildlife. Store food and trash responsibly.

Bears and Food Storage 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.

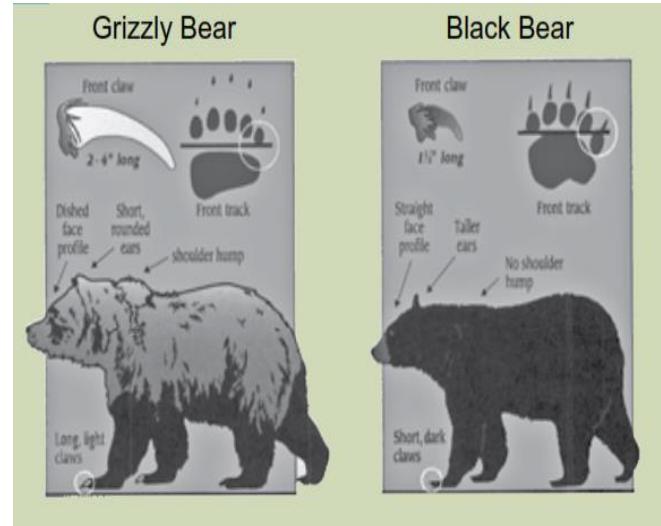
Night attacks on tents are extremely rare, but if this happens you should defend yourself aggressively. Any bear entering your tent at night doesn't have good intentions; if it attacks fight back with any resource you have available to show that you are not easy prey.

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.

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.

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.

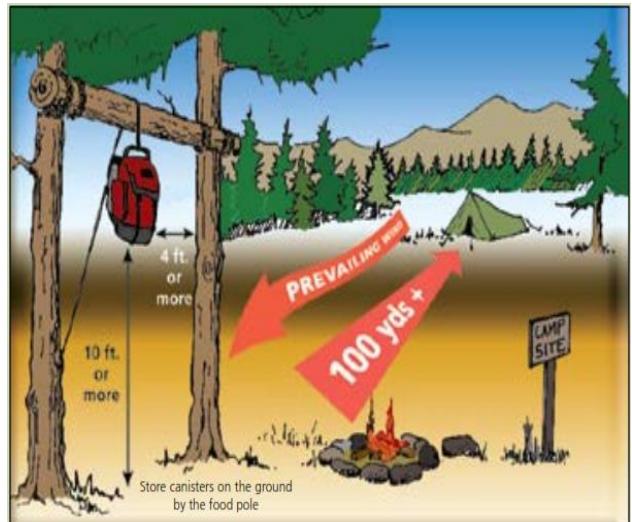
Although bear sprays have been highly effective at stopping charging bears, there are some indications that the residue from some oil-based sprays may possibly act as a bear attractant. Use your spray only as a last ditch deterrent on the bear. Do not spray around your campsite, tent, camping gear, or 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 container is provided at most campsites, so that food and other attractants can be safely stored. 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 Lions

Mountain lions are wild animals and can be dangerous. They have been seen in the park. An attack is unlikely, and the park has never had a reported attack on people or pets. However, mountain lions have attacked in other wilderness areas.

- Watch children closely, and never let them run ahead or lag behind.
- Solo hiking is not encouraged.
- Never approach a mountain lion. Most will avoid a confrontation. Always give them a route to escape.
- Do not run. Try to look large and put your arms up.
- If a mountain lion approaches, wave your arms, shout, and throw rocks or sticks at it.
- If attacked, fight back.

Terrain Safety

Steep Cliffs

Falls from cliffs on trails have resulted in deaths. Loose sand or pebbles on stone are very slippery. Be careful of edges when using cameras or binoculars. Never throw or

roll rocks, as there may be hikers below you. Trails can be snow and ice covered in winter.

- Stay on the trail.
- Stay back from cliff edges.
- Observe posted warnings.
- Please watch children.

Poison Oak

Poison oak is a shrub common in the foothills up to 5,000 feet. Found year-round, avoid encountering poison oak by learning to identify it. Poison oak is often red in the fall with whitish berries, bare in the winter, and shiny green leaves in groups of three in the spring. Remember: leaves of three, let it be!

Water Safety

The mountains are an extreme environment. Carry enough water, one gallon per person per day, and drink it. Water is available at visitor centers, campgrounds, and front country ranger stations. Water flow at known sources can vary, check for information at visitor centers. Do not drink untreated water. Water collected in the wilderness is not safe to drink without treatment.

Stream Crossings

Few of the park'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.

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.

Flash Floods

All narrow canyons are potentially hazardous. Flash floods, often caused by storms miles away, are a real danger and can be life threatening. By entering a narrow canyon you are assuming a risk.

During a flash flood, the water level rises quickly, within minutes or even seconds. A flash flood can rush down a canyon in a wall of water 12 feet high or more. You cannot outrun or outswim a flash flood.

Know the weather and flash flood potential forecasts before starting your trip. If bad weather threatens, do not enter a narrow canyon. Whether hiking, climbing, or canyoneering, your safety depends on your own good judgment, adequate preparation, and constant attention to your surroundings. Your safety is your responsibility.

Watch for these indications of a possible flash flood:

- Any deterioration in weather conditions
- Build up of clouds or sounds of thunder
- Sudden changes in water clarity from clear to muddy
- Floating debris
- Rising water levels or stronger currents
- Increasing roar of water upcanyon

If you observe any of these signs, seek higher ground immediately. Even climbing a few feet may save your life. Remain on high ground until conditions improve. Water levels usually drop within 24 hours. Flash floods do occur

in the park during periods of low flash flood potential. A moderate or higher flash flood potential should be a serious cause for concern.

Safety Tips

Plan Ahead

THE DIFFERENCE BETWEEN A GREAT HIKE OR A TRIP TO THE HOSPITAL IS UP TO YOU!

Your descent into the wilderness marks your entry into a world in which planning and preparation, self-reliance, and good choices are crucial. Don't hike alone. Know what your destination will be and how to get there. Know where water is available. Get the weather forecast. Don't overestimate your capabilities. Hike intelligently. You are responsible for your own safety as well as that of everyone in your party. Stay on the trail and never shortcut switchbacks.

Average temperatures, weather information, and road conditions can also be found in the [Climate](#) section.

WARNING! Summer thunderstorms bring lightning.

Be Kind to Yourself

KNOW YOUR ABILITIES; CHOOSE AN APPROPRIATE HIKE.

You will be hiking at high elevation in hot, dry desert conditions with a steep climb out at the end of the day. Everyone who hikes in the canyon for the first time reports that it was more difficult than they expected. Be conservative in planning your hike!

If you have asthma, diabetes, a heart condition, knee or back problems, or any other health or medical issue, limit both your exertion and your exposure to the heat. The altitude, strenuous climbing, dehydration, and intense inner canyon heat will combine to make any medical problem worse. Stay within your training, physical limitations, and abilities.

Be a Lightweight

THE LESS YOU CARRY, THE MORE ENJOYABLE THE HIKE.

Travel as light as possible. The heaviest items in your pack should be food and water. Use hiking sticks to take stress off your legs. Wear well-fitting and broken-in hiking boots.

Bring a small lightweight flashlight and a change of batteries and bulb. Wear sunscreen, sunglasses, and a hat. Bring a map, compass, signal mirror or whistle, first aid kit, and water purification tablets. Keep in mind that all trash (including biodegradable) needs to be carried out of the canyon.

Avoid Huffing and Puffing

IF YOU CAN TALK WHILE YOU ARE WALKING, YOU ARE WALKING THE PERFECT SPEED.

When you huff and puff your body is not getting enough oxygen. Walking at a pace that allows you to be able to walk and talk means that your legs and your body are getting the oxygen needed to function efficiently.

When your body generates fewer metabolic waste products, you enjoy your hike more and you feel better at the end. At times it may seem like you are walking too slow, but at an aerobic pace (sometimes even baby-sized steps when the trail is steep) your energy reserves will last longer. You will also feel much better that night and the next day.

Take a Break

TAKE A TEN MINUTE BREAK AT LEAST ONCE EVERY HOUR.

A break of ten minutes helps remove the metabolic waste products that build up in your legs while hiking. Take a break at least every hour. Sit down and prop your legs up. Eat some food, drink some fluids, and take this time to enjoy and appreciate the view. These efficient breaks can recharge your batteries. In the long run, breaks will not slow you down.

No Food, No Fuel, No Fun

EAT OFTEN AND DON'T FORCE FLUIDS.

Eat more than you normally do, ensuring you eat before, during, and after your hike. No matter what the temperature, you need water and energy to keep going. Every hour hiking in the canyon can be likened to the physiological equivalent of shoveling wet sand. Plan accordingly when determining how much food and water you should consume during your hike.

Keeping yourself cool while hiking in the canyon takes a large amount of energy (food). Food is your body's primary source of fuel while hiking in the canyon. You need to eat about twice as much as you normally would to meet your energy needs while hiking in the Grand Canyon. Salty snacks and water or sports drink should be consumed on any hike lasting longer than 30 minutes.

Your best defense against illness and exhaustion is to eat a healthy breakfast, and eat regularly throughout your hike.

Summer Hiking

The National Park Service urges SPECIAL CAUTION for all hikers during the summer months.

Every year, scores of unprepared hikers, lured by initially easy downhill hiking, experience severe illness, injury, or death from hiking in the wilderness.

Be aware that efforts to assist you may be delayed during the summer months due to limited staff, the number of rescue calls, employee safety requirements, and limited helicopter flying capability during periods of extreme heat or inclement weather.

Do not rely on physical strength alone, hiking smart will take you much farther. Rangers respond to heat exhausted hikers every day during the summer — don't let yourself become one of them! Use the information below to hike smart.

10 Summer Hiking Essentials

1. **Water** - plain and some with electrolyte replacement.
2. **Food** - especially salty foods. Eat twice as much as normal.
3. **First Aid Kit** - bandaids, ace wrap, antiseptic, moleskin, etc.
4. **Map** - while many trails are well-marked, maps are helpful tools.
5. **Pack** - to carry the essentials.
6. **Flashlight/Spare Batteries** - allows you to hike out during the cool of the evening.
7. **Spray Bottle** - fill with water for your own personal air conditioning system.

8. **Hat/Sunscreen** - to keep the sun off you and protect your skin.
9. **Whistle and/or Signal Mirror** - for emergency use.
10. **Waterproof Clothing** - poncho or jacket; especially useful during monsoon season (mid-July to early September).

Don't Force Fluids. Drink When You Are Thirsty. Rest and Eat Often.

Ambient temperature, elevation, and exercise intensity and duration increase the physiological strain, calorie and water demands on our bodies. This makes canyon hiking more difficult than traveling the same distance on level ground or in cooler temperatures.

Fluid/electrolyte loss can exceed 2 quarts per hour if you hike uphill in direct sunlight and during the hottest time of the day. Because inner canyon air is so dry and hot, sweat evaporates instantly, making its loss almost imperceptible. Keep an eye out for salt rings on your clothes.

Even a mild level of dehydration can make hiking a lot less fun. The more dehydrated you become, the less efficient your body is at self-cooling. This puts you at greater risk for heat related illness. Over-hydration and lack of salty foods can be equally as dangerous, as this may lead to a life-threatening electrolyte disorder called hyponatremia.

The sensations of thirst and hunger are influenced by many factors, and should not be used as the only guide to replenishment. Eat and drink enough throughout your hike to replace the calories and fluid your body is using. Make sure that you balance your food and fluid intake, to avoid the risk of becoming exhausted, debilitated, or severely ill.

Wait for the Shade

AVOID HIKING BETWEEN 10AM AND 4PM!

Even if you are eating and drinking correctly you still need to avoid hiking in direct sunlight during the hottest part of the day. Sun temperatures are 15F to 20F (9C-11C) degrees hotter than posted shade temperatures. And keep in mind, the farther into the canyon you go the hotter it gets!

Plan your day so you are not hiking between the hours of 10am and 4pm. Take a break near shade and water to avoid the worst heat of day. Enjoy a predawn start and a late afternoon finish. Experienced desert hikers know that the timing of their hike is the most important factor in avoiding hazards. Most of the people who need emergency medical help in the canyon due to heat illness are hiking between 10am and 4pm.

Always bring a lightweight flashlight to give yourself the option of hiking out after dark in the event that illness, injury, or enjoyment should slow you down.

Stay Wet and Stay Cool

KEEP YOURSELF SOAKING WET TO STAY COOL.

This is one of the best things that you can do for yourself, it will help decrease your core body temperature. Whenever you are near water, make sure that you wet (actually soak) yourself down. If you hike while soaking wet you will stay reasonably cool. This will make a wonderful difference in how well you feel, especially at the end of the day!

The Hazardous H's

WATCH OUT FOR THESE HEALTH HAZARDS!

HEAT EXHAUSTION

- The result of dehydration due to intense sweating. Hikers can lose one or two quarts (liters) of water per hour. Rangers at Phantom Ranch and Indian Garden treat many cases of heat exhaustion each day in summer.
- *Symptoms:* pale face, nausea, vomiting, cool and moist skin, headache, cramps.
- *Treatment:* drink water with electrolytes, eat high-energy foods (with fats and sugars), rest in the shade for 30-45 minutes, and cool the body by getting wet.

HEATSTROKE

- A life-threatening emergency where the body's heat regulating mechanisms become overwhelmed by a combination of internal heat production and environmental demands. Your body loses its ability to cool itself. Grand Canyon has two to three cases of heatstroke a year.

Untreated heat exhaustion can lead to heatstroke.

- *Symptoms:* flushed face, dry skin, weak and rapid pulse, high core body temperature, confusion, poor judgment or inability to cope, unconsciousness, seizures.
- *Treatment:* the heatstroke victim must be cooled immediately! Continuously pour water on the victim's head and torso, fan to create an evaporative cooling effect. Immerse the victim in cold water if possible. Move the victim to shade and remove excess clothing. The victim needs evacuation to a hospital. Someone should go for help while attempts to cool the victim continue.

HYPONATREMIA (water intoxication)

- An illness that mimics the early symptoms of heat exhaustion. It is the result of low sodium in the blood caused by drinking too much water and losing too much salt through sweating.
- *Symptoms:* nausea, vomiting, altered mental states, confusion, and frequent urination. The victim may appear intoxicated. In extreme cases seizures may occur.
- *Treatment:* have the victim eat salty foods, slowly drink sports drinks with electrolytes, and rest in the shade. If mental alertness decreases, seek immediate help!

HYPOTHERMIA

- A life-threatening emergency where the body cannot keep itself warm, due to exhaustion and exposure to cold, wet, windy weather.
- *Symptoms:* uncontrolled shivering, poor muscle control, carelessness attitude. Look for signs of the "umbles" - stumbling, mumbling, fumbling, grumbling.
- *Treatment:* remove wet clothing and put on dry clothing, drink warm sugary liquids, warm victim by body contact with another person, protect from wind, rain, and cold.
- Avoid hypothermia by checking at Canyon View Information Plaza or the Backcountry Information Center for the latest weather and trail conditions, taking layered clothing for protection against cold and wet weather, eating

frequently, replacing fluids and electrolytes by drinking before feeling thirsty, and avoiding exposure to wet weather.

Winter Hiking

Every year, scores of unprepared hikers, lured by initially easy downhill hiking, experience severe illness, injury, or death from hiking in the canyon. Travel in Grand Canyon National Park's backcountry has inherent risks and involves unavoidable hazards. Your safety depends upon your judgment, your experience, and a realistic assessment of your abilities.

A successful and safe winter hike depends on weather and routes, but realize that any hike can be affected by unforeseen natural occurrences. Routes and trails are susceptible to deterioration from rockslides. Weather, at any time of the year, can compromise an individual's ability to cope with the psychological challenges of backcountry travel. Always be sure you have adequate food, water, and equipment to deal with the unexpected.

If you have doubts as to your ability to hike safely in the Grand Canyon, do not attempt to do so! All visitors should be aware that efforts to assist them may be delayed and limited due to weather, rescuer safety, and incident urgency.

Do not rely on physical strength alone, hiking smart will take you much farther. Use this information to hike smart.

10 Winter Hiking Essentials

1. **Food** – especially salty foods. Eat twice as much as normal.
2. **First Aid Kit** – bandaids, ace wrap, antiseptic, moleskin, etc.
3. **Map** – while many trails are well-marked, maps are helpful tools.
4. **Water** – plain and some with electrolyte replacement.
5. **Pack** – to carry the essentials.
6. **Flashlight/Spare Batteries** – allows you to hike out at night.
7. **Appropriate Footwear** - waterproof boots, gaiters to keep snow and mud out of your boots.

8. **Over-the-shoe traction devices** - it will only take a short and unexpected stretch of ice to make you glad you have extra traction.
9. **Hiking Poles** – to help with footing on icy trails.
10. **Whistle and/or Signal Mirror** – for emergency use, know how to use your equipment.
11. **Waterproof/Warm Clothing** – parka, hat, gloves for the snow and rain, plus an extra set of dry clothing – in case you get wet.

The Hazardous H

WATCH OUT FOR THIS HEALTH HAZARD!

HYPOTHERMIA

- A life-threatening emergency where the body cannot keep itself warm, due to exhaustion and exposure to cold, wet, windy weather.
- *Symptoms:* uncontrolled shivering, poor muscle control, careless attitude, confusion, exhaustion (even after rest). Look for signs of the "umbles" - stumbling, mumbling, fumbling, grumbling.
- *Treatment:* remove wet clothing and put on dry clothing, drink warm sugary liquids, warm victim by body contact with another person, protect from wind, rain, and cold. If re-warming is unsuccessful - seek help.
- Avoid hypothermia by checking at the Visitor Center or the Backcountry Information Center for the latest weather and trail conditions, taking layered clothing for protection against cold and wet weather, eating frequently, replacing fluids and electrolytes by drinking before feeling thirsty, and avoiding exposure to wet weather.

Trail Conditions

KNOW TRAIL CONDITIONS BEFORE YOU START!

Some trails are more difficult than others to navigate in the winter. Stop by the Backcountry Information Center prior to your hike for a trail update. Pay close attention to the weather forecast. Winter travelers are reminded that precipitation patterns in Southern Utah are quite variable. Just because it is the winter season doesn't mean it looks or feels like winter on the ground.

Weather Dangers

Lightning

- Go to low-lying areas away from cliff edges, lone trees, poles, or metal objects. Make sure the area is not subject to flash floods. Do not seek shelter in caves or alcoves.
- Become a smaller target by squatting low on the ground. Place hands on knees or back of neck with head between knees. Do not lie down or touch the ground with your hands. Minimize contact with the ground and nearby rocks to minimize ground current effects caused by a nearby strike.
- Lightning can strike 10 miles across the canyon, so being below the rim does not make you at a low spot.

Rock Falls

- Watch and listen for rock falls and slides, especially during and after downpours.
- Do not stand at places where rocks have obviously fallen before.

Flash Floods

All narrow canyons are potentially hazardous. Flash floods, often caused by storms miles away, are a real danger and can be life threatening. By entering a narrow canyon you are assuming a risk.

During a flash flood, the water level rises quickly, within minutes or even seconds. A flash flood can rush down a canyon in a wall of water 12 feet high or more. You cannot outrun or outswim a flash flood.

Know the weather and flash flood potential forecasts before starting your trip. If bad weather threatens, do not enter a narrow canyon. Whether hiking, climbing, or canyoneering, your safety depends on your own good judgment, adequate preparation, and constant attention to your surroundings. Your safety is your responsibility.

Watch for these indications of a possible flash flood:

- Any deterioration in weather conditions
- Buildup of clouds or sounds of thunder

- Sudden changes in water clarity from clear to muddy
- Floating debris
- Rising water levels or stronger currents
- Increasing roar of water upcanyon

If you observe any of these signs, seek higher ground immediately. Even climbing a few feet may save your life. Remain on high ground until conditions improve. Water levels usually drop within 24 hours. Flash floods do occur in the park during periods of low flash flood potential. A moderate or higher flash flood potential should be a serious cause for concern.

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.

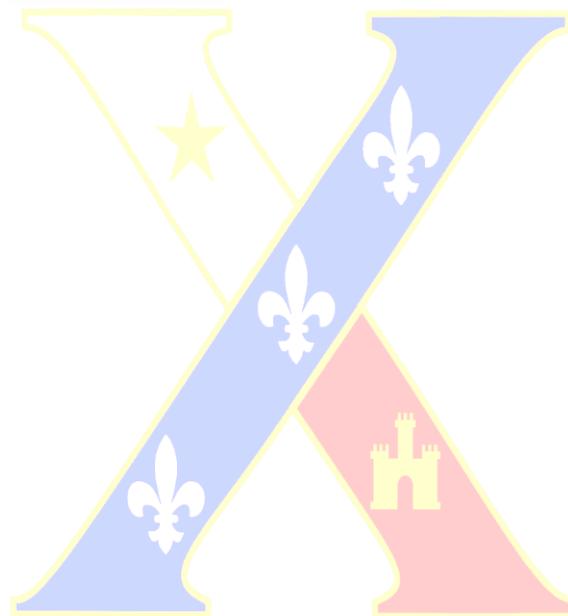


Prevention is by gradually increasing elevation by no more than 300 meters (1,000 ft) per day. Pre-medicating with the drug acetazolamide (trade name Diamox) may help some people making a rapid ascent to sleeping altitude above 2,700 meters (9,000 ft), and it may also be effective if started early in 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.



The Expedition

The "Trans-Zion Trek" (also referred to as the "Zion Traverse") is a multi-day backpacking hike that connects several of Zion's trails into one long route from one corner of the park to the other. This strenuous and beautiful hike can take on average between three to five days and involves a lot of elevation gains and drops. Along the way, you will see some of Zion's most awe-inspiring scenery as well as many beautiful spots that most dayhikers never experience. Total mileage: roughly 48 miles. Before attempting this hike, you must work out the logistics of getting backcountry permits, planning your campsite spots for each night, car shuttles/car spots, and water sources (caching water and/or using available springs and streams).

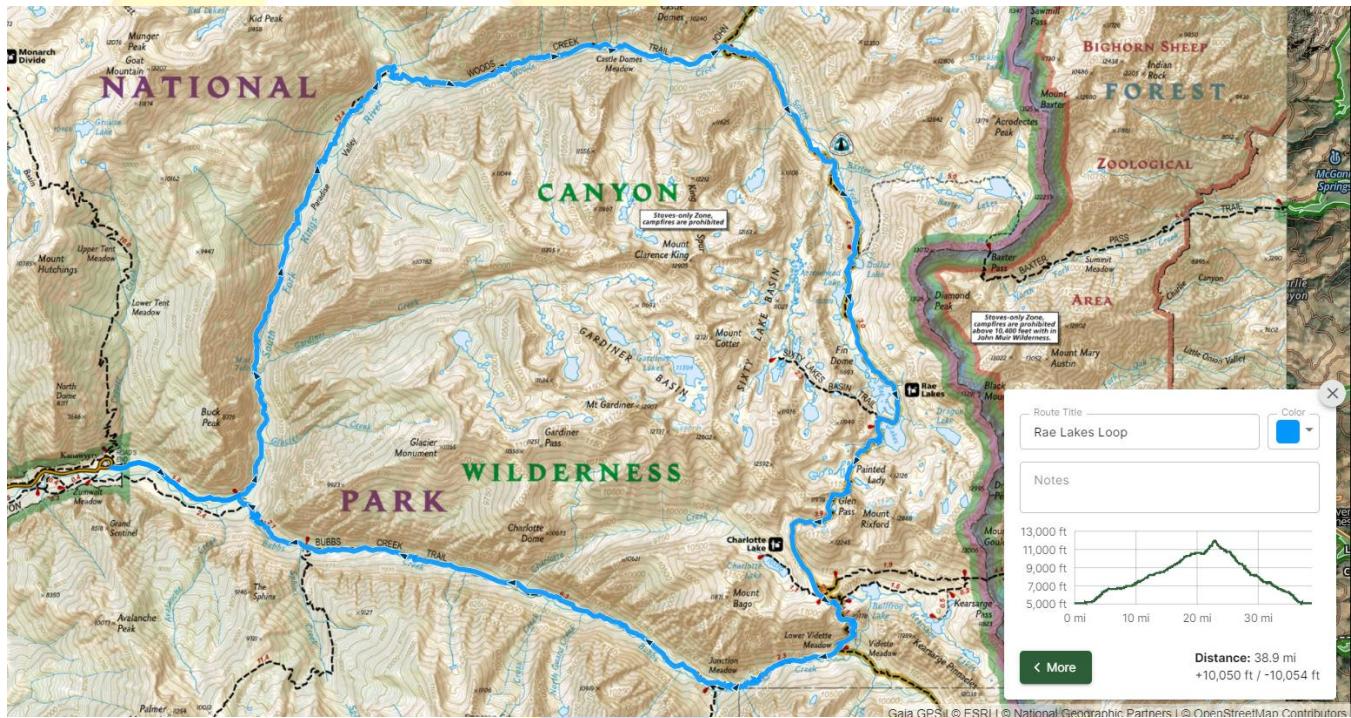
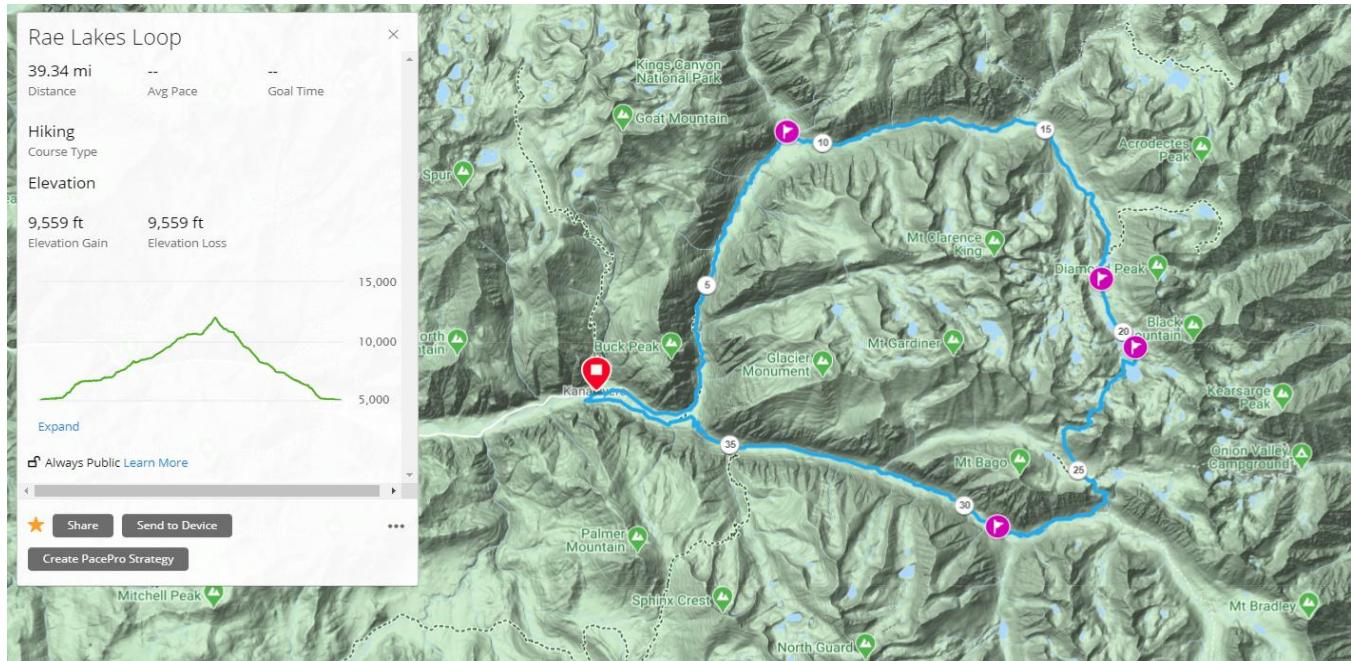
Itinerary

| KINGS CANYON ITENERARY for JULY-AUGUST of 2020 | | | | | | | |
|--|---|--------------------------------|-----------|---------------|---------------|--------------|--------------|
| Date | Day/Activity | Night/Camp | Distance | Positive Gain | Negative Gain | Overall Gain | Travel Times |
| 7/26/2020 | Fly into Fresno, supply run, obtain permits, frontcountry camp at Canyon View | Canyon View | | | | | |
| 7/27/2020 | Drive to trailhead at Roads End, hike to middle Paradise Valley Campsite | Paradise Valley Campsite | 8.92 mi. | 2853 ft. | 918 ft. | 1935 ft. | 7.92 hrs. |
| 7/28/2020 | Hike from Paradise Valley to Arrowhead Lake. River crossing. | Arrowhead Lake Campsite | 9.86 mi. | 3957 ft. | 606 ft. | 3351 ft. | 9.62 hrs. |
| 7/29/2020 | Hike from Arrowhead Lake to Middle Rae Lake. | Middle Rae Lake area | 1.65 mi. | 421 ft. | 117 ft. | 304 ft. | 1.35 hrs. |
| 7/30/2020 | Hike from Middle Rae Lake to Bubb's Creek trail. | East Creek trail junction area | 8.68 mi. | 1887 ft. | 4351 ft. | -2464 ft. | 6.74 hrs. |
| 7/31/2020 | Hike the Bubbs Creek trail back to Roads End trailhead. | Frontcountry campsite | 10.23 mi. | 655 ft. | 3799 ft. | -3144 ft. | 6.25 hrs. |
| 8/1/2020 | Tour the park | Hotel in Fresno | mi. | ft. | ft. | 0 ft. | 0.00 hrs. |
| 8/2/2020 | Fly home | | | | | | |
| Totals | | | 39.34 mi. | 9773 ft. | 9791 ft. | -18 ft. | 31.89 hrs. |

Elevation Profile



Topographical Map of the Rae Lakes Loop



Hiking Routes

Day 1

Trailhead: Roads End

Elevation Gain: 2853 ft.

Campsite: Upper Paradise Valley

Elevation Loss: 918 ft.

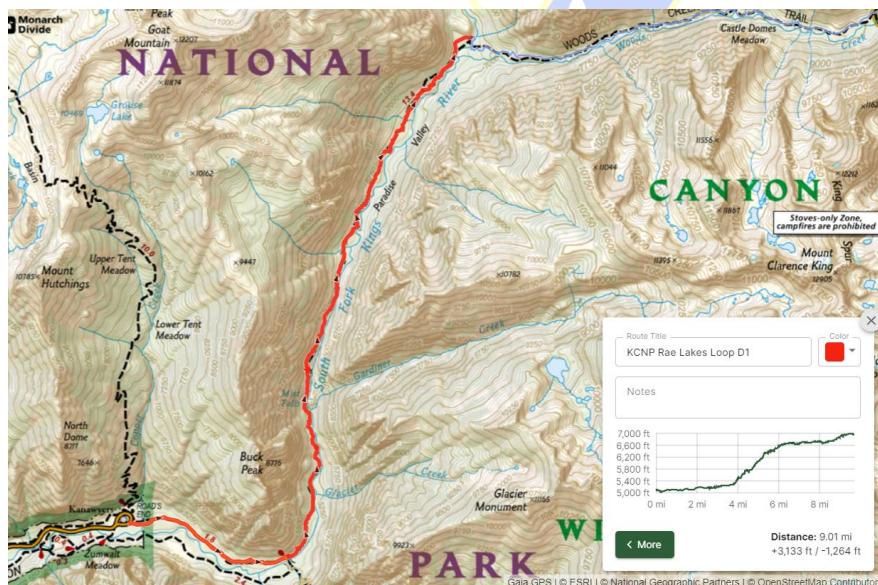
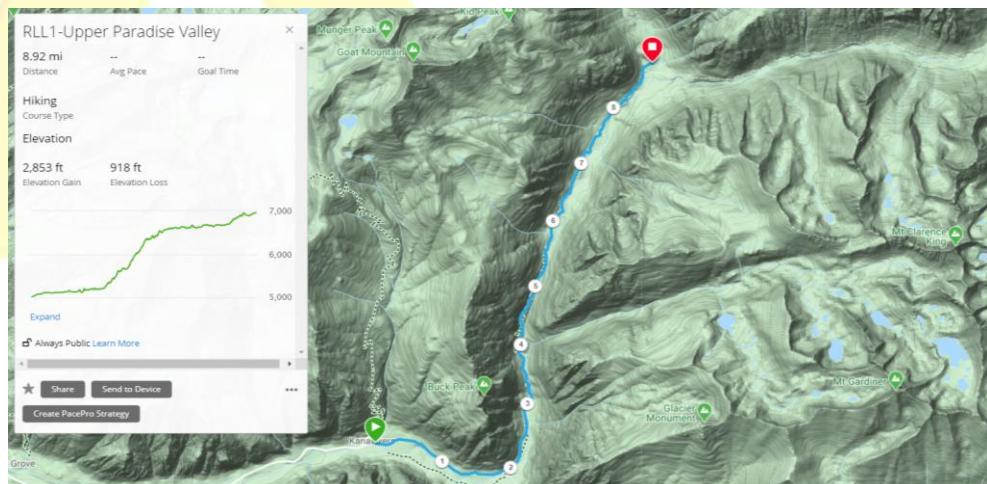
Mileage: 8.92 mi.

Travel Time: 7.92 hrs.

Water Locations: Kings River

Emergency Access/Egress: Back to Roads End

Start by the trail from Roads End to the Baily Bridge. This will bring you to the fork at 1.9 miles, just before the Baily Bridge. From here, follow the trail to Paradise Valley to the campsites at 6.5 miles. Beyond the camps, the trail dips and rises through the shade, continuing up the river valley. At about 7.5 miles you will reach a second but smaller campground, also with a bear box and pit toilet. The trail advances through a fire-scarred area and a sunny meadow; switchbacks and a few ups and downs bring you to the last campsite in the valley, just beyond the signed stock crossing. A pit toilet and a large bear box are located here.



Day 2

Trailhead: Upper Paradise Valley

Elevation Gain: 3957 ft.

Campsite: Arrowhead Lake

Elevation Loss: 606 ft.

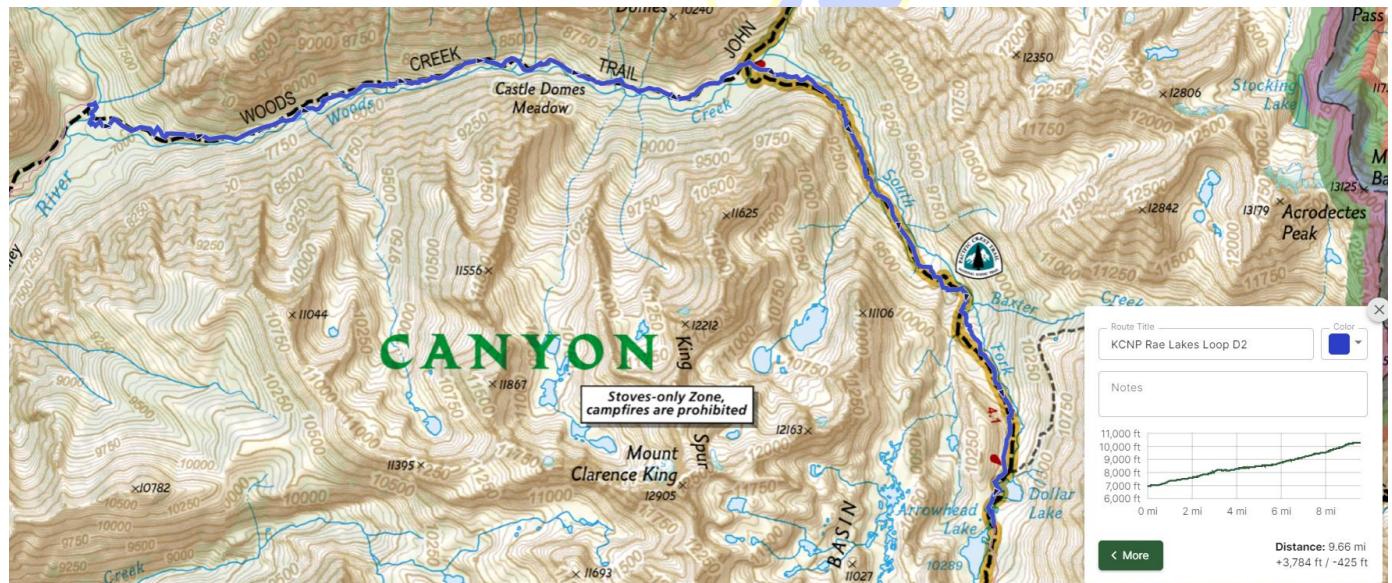
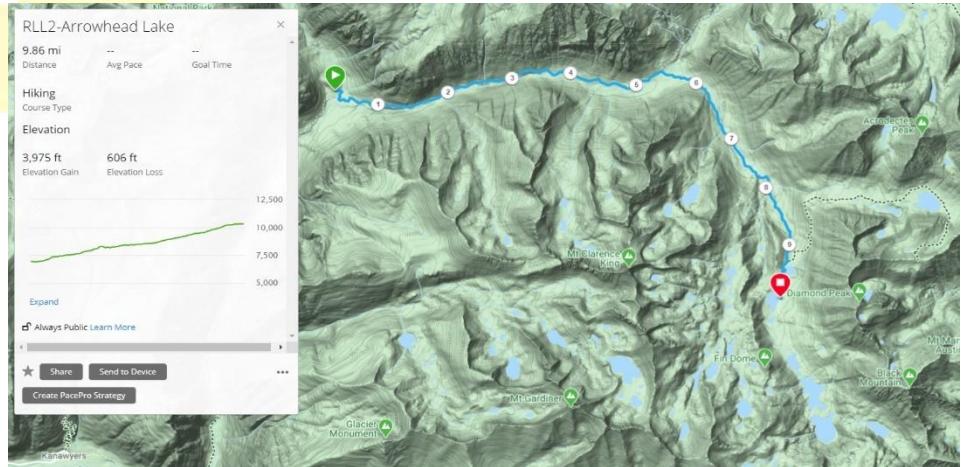
Mileage: 9.86 mi.

Travel Time: 9.62 hrs.

Water Locations: Woods Creek/South Fork

Emergency Access/Egress: Rae Lakes Ranger Station

From the Upper Paradise Valley campground, at the 8.9-mile mark, you will cross the South Fork of the Kings River. Large logs aid your crossing in the early season, but later in the year, an easy rock-hop is to the left. On the other side of the river, the path travels through shady woodland, crossing a brook on a small log footbridge. This pleasant, shady trail soon turns rocky and begins to climb above the Woods Creek. The forest cover thins, and the trail ascends short switchbacks to avoid rocky outcroppings. At times, the route descends close to the creek, then sours high above and down again. The trail then drops down into the aspen lined Castle Domes Meadow at 14.5 miles, with Window Peak and the Castle Domes towering above. From there the trail reenters the forest and continues to dip and rise while passing a few campsites along the way. The John Muir Trail/Pacific Crest Trail intersection is just beyond the signed stock crossing at 16.0 miles. Turn right (south) on the John Muir Trail. Cross over Woods Creek on a buoyancy suspension bridge and on the other side will be campsites with large bear boxes. From the campsite the trail climbs moderately as the forest cover thins, then continues its undulating and switch-backing course through aspens and junipers. Soon you will come to a ford of a small creek with a log crossing during high water, on your right (west). The climbs become steeper before the path descends to a stock gate at a bridged crossing of the outlet flowing down from Sixty Lake Basin, passing the dim Baxter Pass Trail and reaching Dollar Lake at 21.0 miles. You will then round the west side of Dollar Lake and come to the South Fork Crossing of Woods Creek below Diamond Peak, then the trail passes Arrowhead Lake and a side trail to campsites on its east shore.



Day 3

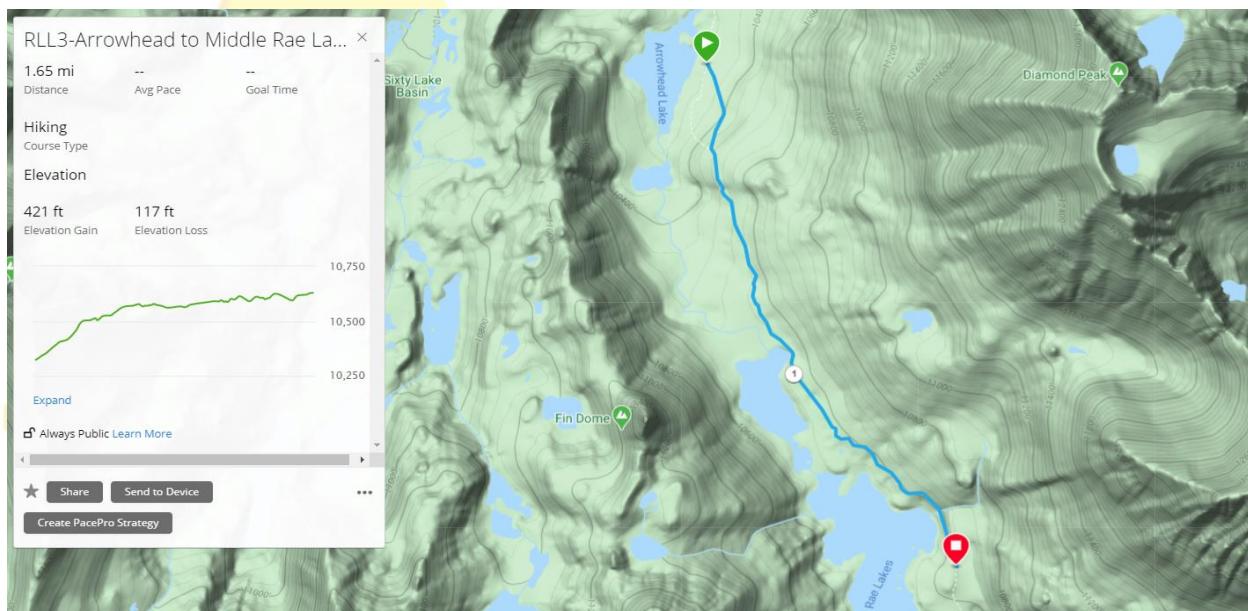
Trailhead: Arrowhead Lake
Campsite: Middle Rae Lakes
Mileage: 1.65 mi.

Elevation Gain: 421 ft.
Elevation Loss: 117 ft.
Travel Time: 1.35 hrs.

Water Locations: Arrowhead Lake/Rae Lakes

Emergency Access/Egress: Rae Lakes Ranger Station

As you leave the campsite Fin Dome stands like a beacon as you near the Rae Lakes, passing a side trail leading to the west shore of Arrowhead Lake. The path ascends past the northern tip of the lowest lake, then passes a side trail that leads to campsites and bear boxes near the shore of the Middle Rae Lake at 22.5 miles.



Day 4

Trailhead: Middle Rae Lakes

Elevation Gain: 1887 ft.

Campsite: Junction Meadow

Elevation Loss: 4351 ft.

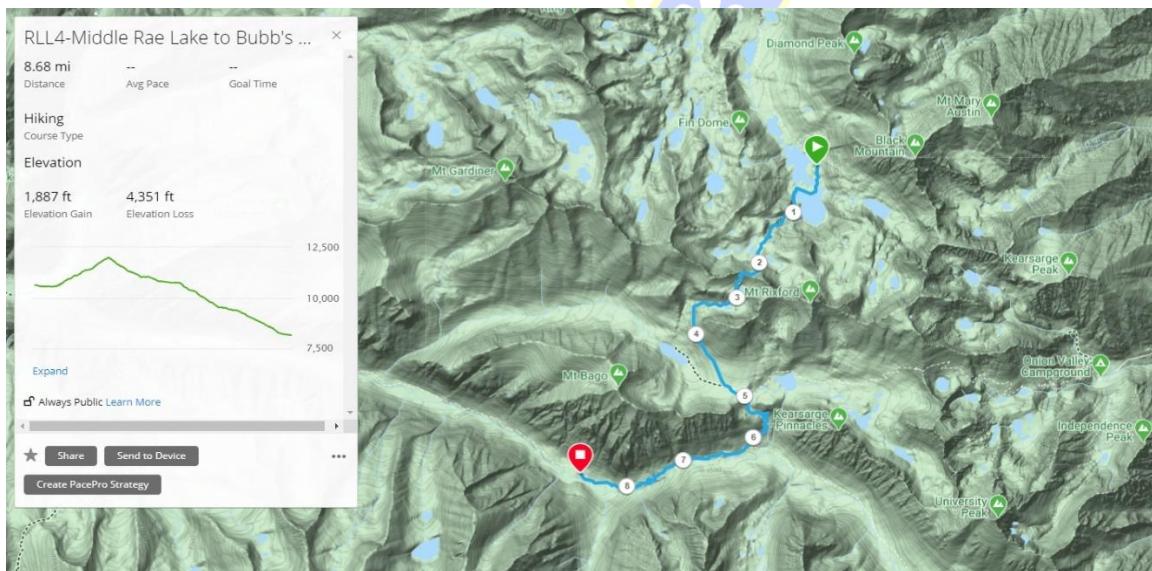
Mileage: 8.68 mi.

Travel Time: 6.74 hrs.

Water Locations: Rae Lakes/Bubbs Creek

Emergency Access/Egress: Rae Lakes Ranger Station

As you leave the campground you will see the small backcountry ranger station to the left (east) of the trail. Travel high above the lake before dropping down to meet another side trail that leads to campsites and bear boxes near the lake's south end. Finn Dome towers above the lake in the west, while Mount Gould, Painted Lady, and Mount Rixford are visible to the south. The trail continues through a meadow section, advancing past an obscure path to Dragon Lake before crossing the land bridge between the middle and the highest of the Rae Lakes. A rock-hop leads across the tiny stream connecting the two lakes. The trail passes the steep trail to Sixty Lake Basin and turns to the south, traveling above the highest Rae Lake. The route ascends switchbacks, passes a pond, and becomes increasingly rocky and steep as it winds through the granite past high and desolate lakes. Numerous switchbacks, some steep and slippery, rise to Glen Pass at 27.5 miles. After traversing the narrow ridge of the pass, the trail descends first rocky, then sandy switchbacks high above a large blue lake. Winding down past an aqua blue tarn, the path enters the trees and undulates on a slope high above Charlotte Lake, with a view of Charlotte Dome to the west. To the north of this dome you can spot the pointed summit of Mount Gardiner. After passing a trail that connects with the Kearsarge Pass Trail, you intersect the Kearsarge Pass and Charlotte Lake Trails at a four-way junction at mile 30.1. Continue on the John Muir/Pacific Crest Trail, crossing a small rise, then switchback steeply down. At 30.4 miles you will meet the Bullfrog Lake and Kearsarge Lakes Trail. Continue southeast, descending more switchbacks on the John Muir Trail, and crossing the outlet of two small lakes located near Bullfrog Lake. As you continue, you gain views of the Kearsarge Pinnacles, the Kings-Kern Divide, and East and West Vidette. At 31.2 miles you arrive at Vidette Meadow, with campsites and bear boxes. From this point, turn right (west) and follow the path down switchbacks until you arrive at Junction Meadow.



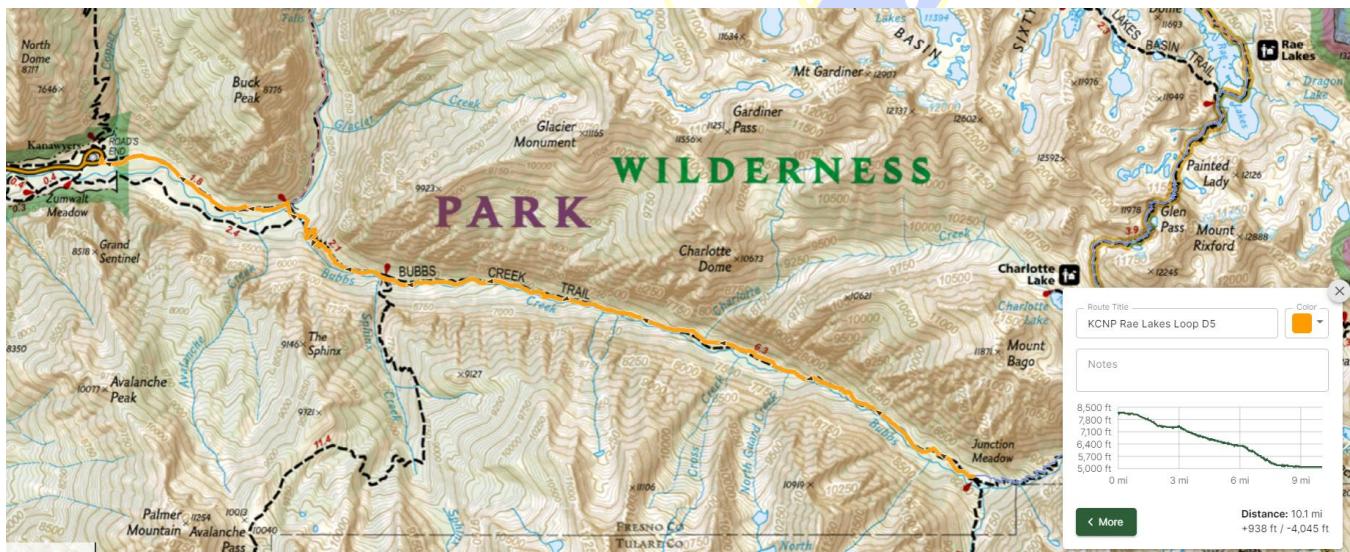
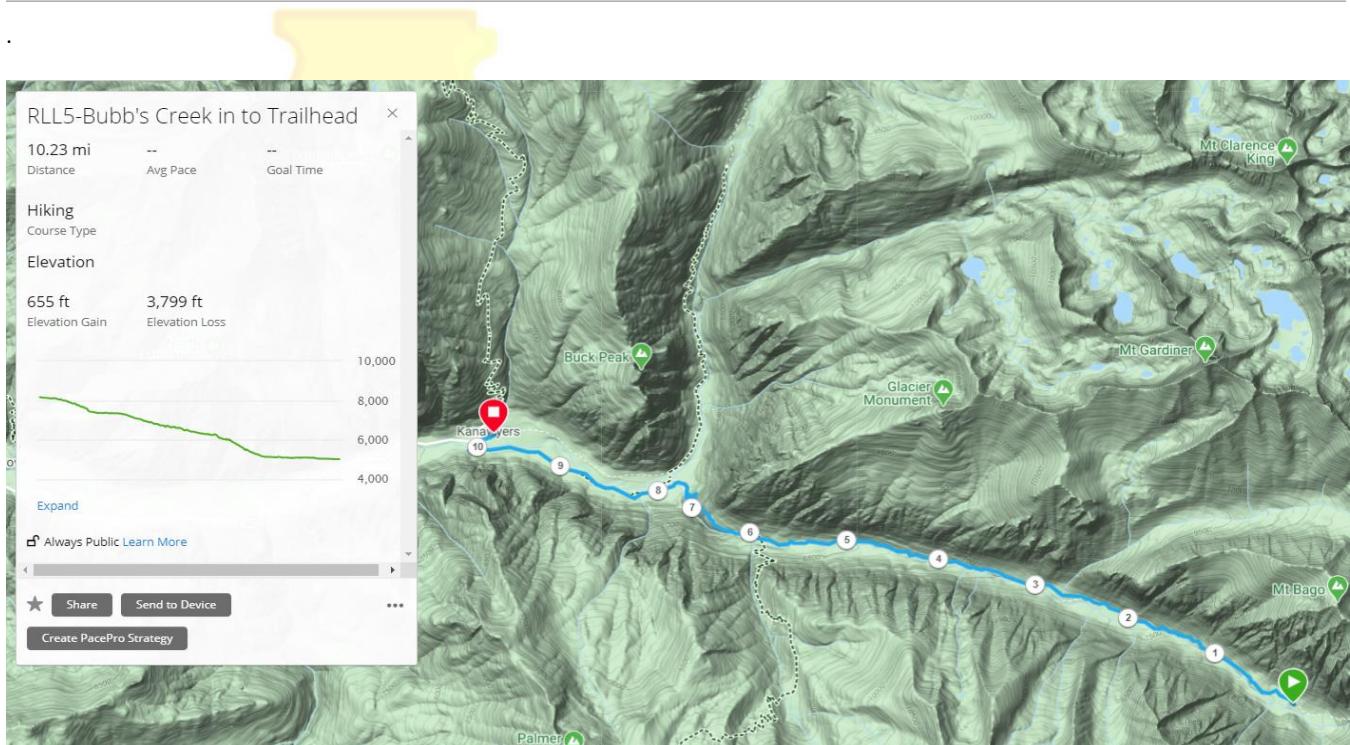
Day 5

Trailhead: Junction Meadow
Campsite: Roads End Trailhead
Mileage: 10.23 mi.

Elevation Gain: 655 ft.
Elevation Loss: 3799 ft.
Travel Time: 6.25 hrs.

Water Locations: Bubbs Creek

Emergency Access/Egress: Roads End Trailhead



Topography & Maps

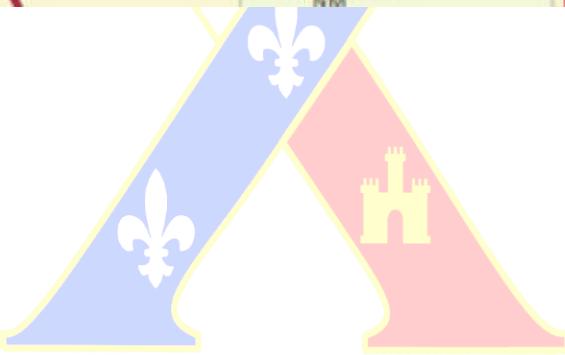
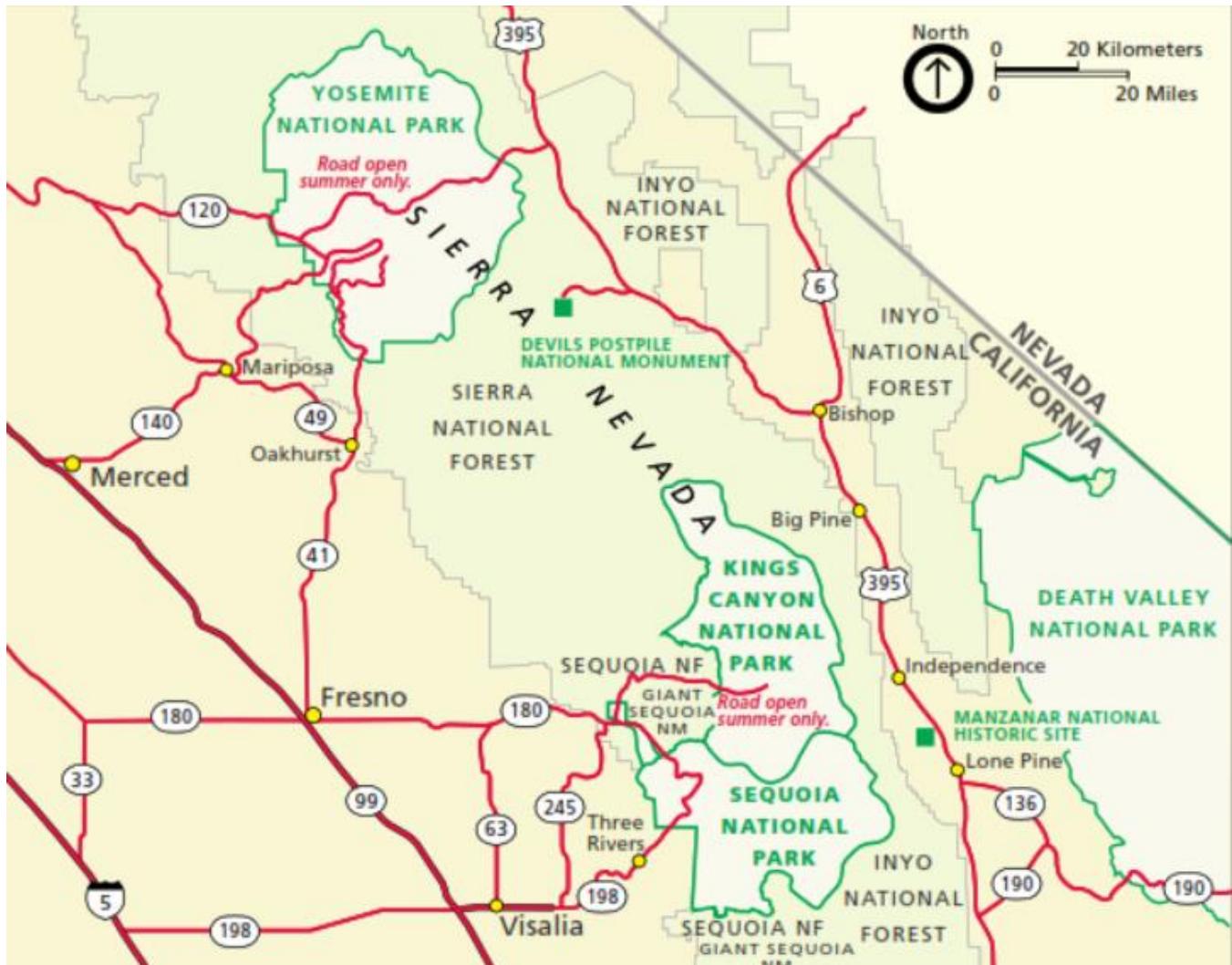
Kings Canyon/Sequoia National Park Map



Kings Canyon/Sequoia Driving Map



Kings Canyon/Sequoia Region Map

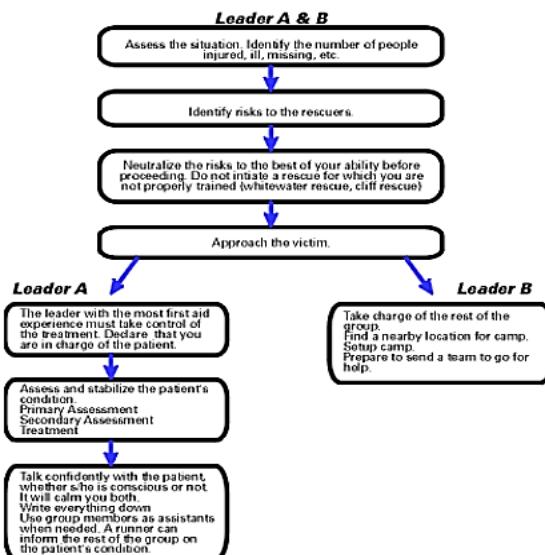


Emergency Action Plan (EAP)

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.



Emergency Response Flow Chart



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 Assistance | Person Cannot Walk Out |
|--|--|--|
| <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> 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.

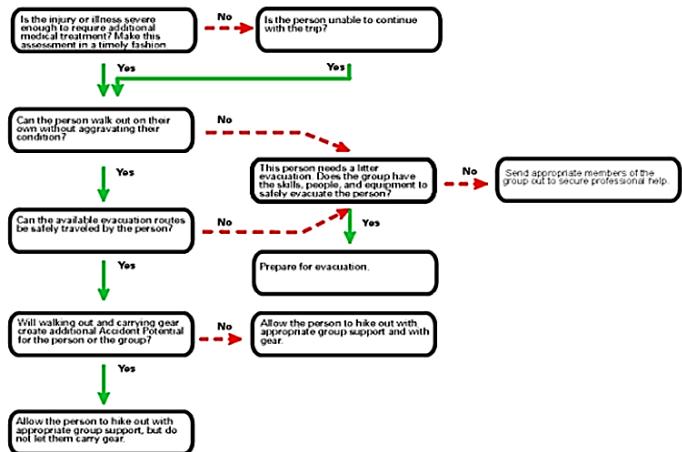
_____ How much daylight do you have?

_____ 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?

Evacuation Flow Chart

Evacuation Plan Flow Chart



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.

Emergency Call – Ins/Rescue

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



Gear Loadout

Communications and Navigation

Recommended Communication Equipment

| Motorola T600 H2O 2-Way Radio | | Garmin inReach Mini |
|--|--|---|
|  <p>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.</p> <p>Motorola T600 H2O 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.</p> <p>Push-To-Talk (PTT) power boost allows you to extend the transmission range by increasing the transmitter power output.</p> <p>Hands-free communication is provided by iVOX/VOX, which acts like a speakerphone to keep your hands free as you hike</p> | |  <p>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.</p> <ul style="list-style-type: none">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 devicesOptional inReach weather forecast service provides detailed updates directly to your inReach Mini or paired device; basic and premium weather packages availableSend and receive inReach messages through compatible Garmin devices, including connected wearables and handhelds |
| Emergency Frequency: [REDACTED] | | Garmin Link for Tracking: [REDACTED] |
| Ranger Frequency: [REDACTED] | | |

Recommended Tracking & Emergency Signal Devices

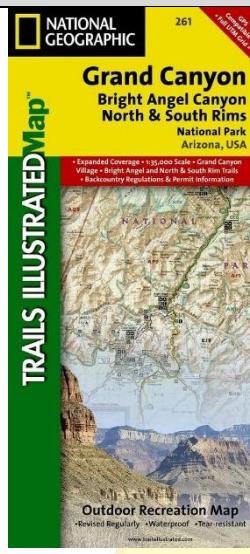
| Garmin Rino 755t | |
|---|---|
|  | We will have one Rino device for navigation, gps tracking and emergency communications. High-sensitivity GPS with GLONASS satellite reception tracks satellites in more challenging environments than GPS alone. Powerful, 5 watt FRS/GMRS 2-way radio lets you communicate 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 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. |

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 handelds. 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 multinection (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:

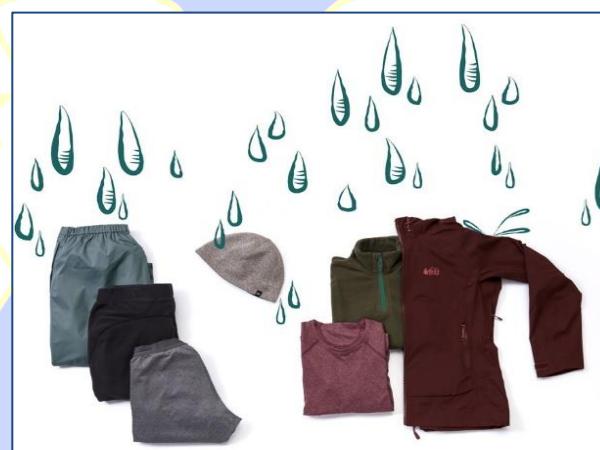
Cold-weather layers:

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:

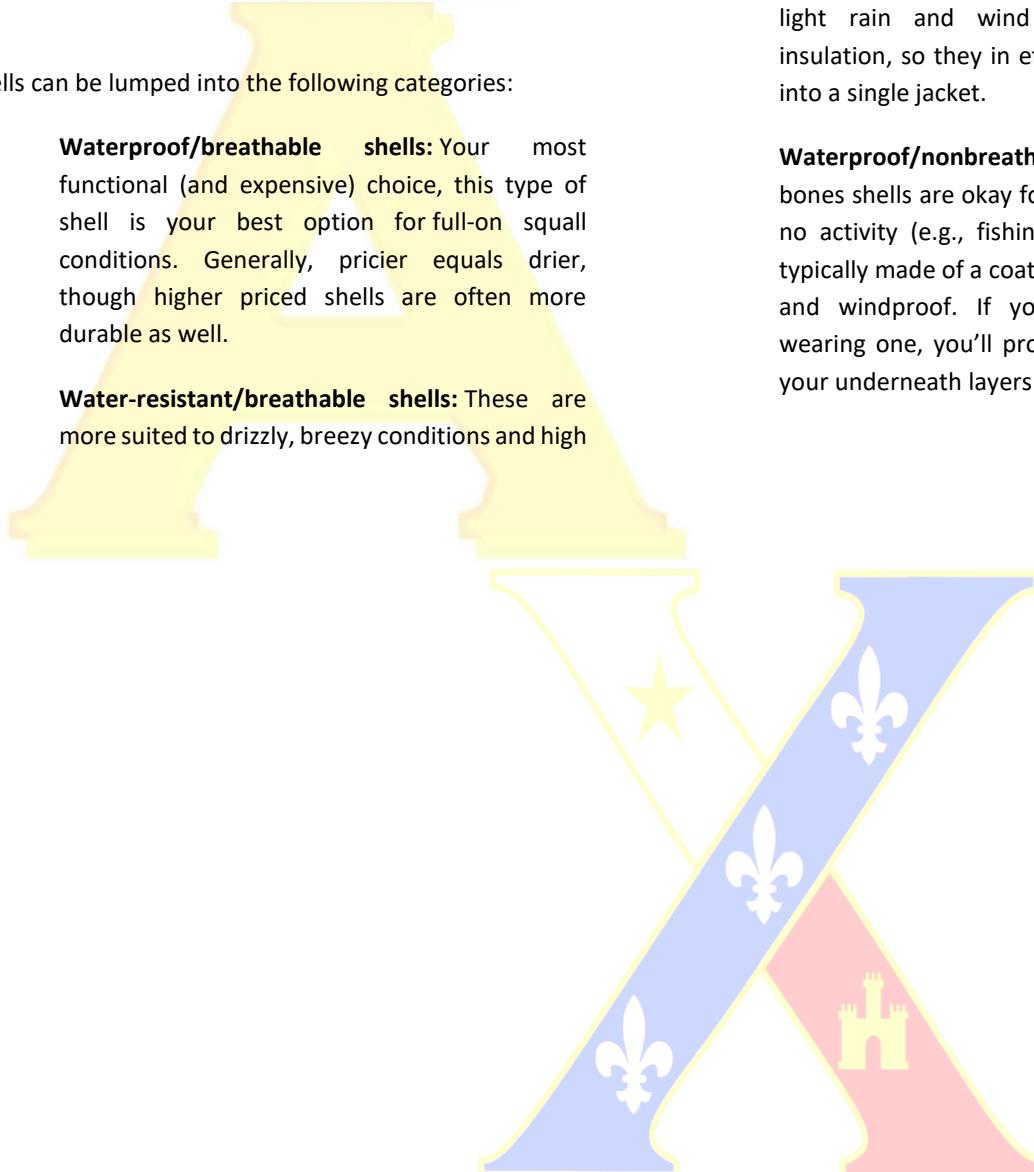
Waterproof/breathable shells: Your most functional (and expensive) choice, this type of shell is your best option for full-on squall conditions. Generally, pricier equals drier, though higher priced shells are often more durable as well.

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 | 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/ |

Recommended Local Clothing Retailers – Lafayette, Louisiana

| | | | |
|----|---|----------------|---|
| 1. |  | Pack & Paddle | https://packpaddle.com/ (Highly Recommended) |
| 2. |  | The Backpacker | https://backpackeroutdoors.com/ |
| 3. |  | Field & Stream | https://www.fieldandstreamshop.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 tent-mates 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 two-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 | <i>Backpack</i> | 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. |
| | <i>Daypack</i> | Osprey | Hydration system is key. |
| | <i>Compression/Stuff Sacks</i> | Sea to Summit | These will protect your gear within your pack and help to keep it organized. Waterproof. |
| | <i>Pack Cover</i> | Osprey | Make sure the cover fits completely around your pack when fully loaded. |
| Shelter | <i>Tent</i> | REI Co-Op Big Agnes Nemo Kelty Sierra Designs | 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 | <i>Sleeping Bag</i> | Big Agnes Marmot REI Co-Op Nemo | 20 degree rating is preferred. Major differences are between down or synthetic. Each has its benefits. |
| | <i>Sleeping Pad</i> | Therm-a-Rest Klymit Nemo | Pay attention to thermal rating. Also note the durability. A leaky pad during winter camping can suck. |
| | <i>Camp Pillow</i> | Sea to Summit Klymit | |
| Kitchen | <i>Stove</i> | Jetboil | |
| | <i>Utensils</i> | | Need to be lightweight with a small footprint. |
| Health, Hygiene & Safety | <i>First Aid Kit</i> | Adventure Medical Kits | |
| | <i>Wipes</i> | Dude Wipes | Must be biodegradable. |
| | <i>Water Filter</i> | Sawyer Lifestraw Platypus | |
| Personal Gear/Tools | <i>Gaiters</i> | Outdoor Research | |
| | <i>Trekking Poles</i> | Black Diamond | |
| | <i>Camp Chair</i> | Helinox REI-Co Op | The lighter the better. |
| | <i>Head Lamp</i> | Black Diamond | |
| Navigation/ Electronics | <i>Radio</i> | Motorola | Used for communicating with other members of your team. Need to be weather proof and at least splash resistant. |
| | <i>Battery Pack Charger</i> | Anker | |
| | <i>Solar Power</i> | Goal Zero | |
| | <i>GPS</i> | Garmin | |
| | <i>PLB & Satellite Messaging</i> | Garmin | |

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/ |

Recommended Local Gear Retailers – Lafayette, Louisiana

| | | | |
|----|---|----------------|---|
| 1. |  | Pack & Paddle | https://packpaddle.com/ (Highly Recommended) |
| 2. |  | The Backpacker | https://backpackeroutdoors.com/ |
| 3. |  | Field & Stream | https://www.fieldandstreamshop.com/ |

Gear Checklist

Packing System:

- | | |
|---|------------|
| <input type="checkbox"/> Backpack | _____ lbs. |
| <input type="checkbox"/> Daypack* | _____ lbs. |
| <input type="checkbox"/> Compression/Stuff Sack | _____ lbs. |
| <input type="checkbox"/> Pack/Rain Cover | _____ lbs. |

- | | |
|---|------------|
| <input type="checkbox"/> Waterproof VHF Radio* | _____ lbs. |
| <input type="checkbox"/> Battery Charging Kit** | _____ lbs. |
| <input type="checkbox"/> Phone* | _____ lbs. |
| <input type="checkbox"/> Flashlight/lamp | _____ lbs. |
| <input type="checkbox"/> Headlamp | _____ lbs |

Shelter System:

- | | |
|---------------------------------------|------------|
| <input type="checkbox"/> Tent/Hammock | _____ lbs. |
| <input type="checkbox"/> Tent Pad | _____ lbs. |

Health, Hygiene, and Safety System:

- | | |
|---|------------|
| <input type="checkbox"/> First Aid Kit | _____ lbs. |
| <input type="checkbox"/> Water Bottle/Bladder | _____ lbs. |
| <input type="checkbox"/> Water Treatment | _____ lbs. |
| <input type="checkbox"/> Hygiene Kit** | _____ lbs. |
| <input type="checkbox"/> Foot Care Kit** | _____ lbs. |
| <input type="checkbox"/> Sunscreen & Lip Balm | _____ lbs. |
| <input type="checkbox"/> Insect Repellant | _____ lbs. |
| <input type="checkbox"/> Personal Medication | _____ lbs. |
| <input type="checkbox"/> Sunglasses | _____ lbs. |
| <input type="checkbox"/> Pack Towel | _____ lbs. |

Sleep System:

- | | |
|---------------------------------------|------------|
| <input type="checkbox"/> Sleeping Bag | _____ lbs. |
| <input type="checkbox"/> Sleeping Pad | _____ lbs. |
| <input type="checkbox"/> Camp Pillow* | _____ lbs. |

Clothing System:

- | | |
|--|------------|
| <input type="checkbox"/> Base Layer – Torso | |
| <input type="checkbox"/> Base Layer – Legs | |
| <input type="checkbox"/> Insulation Layer – Torso* | _____ lbs. |
| <input type="checkbox"/> Insulation Layer – Legs* | _____ lbs. |
| <input type="checkbox"/> Outer Layer – Torso | |
| <input type="checkbox"/> Outer Layer – Legs | |
| <input type="checkbox"/> Briefs x 3 | _____ lbs. |
| <input type="checkbox"/> Socks x 3 pair | _____ lbs. |
| <input type="checkbox"/> Hiking Boots | |
| <input type="checkbox"/> Belt | |
| <input type="checkbox"/> Hat | |
| <input type="checkbox"/> Beanie* | _____ lbs. |
| <input type="checkbox"/> Hiking Gloves | _____ lbs. |
| <input type="checkbox"/> Thermal Gloves* | _____ lbs. |

Kitchen System:

- | | |
|--|------------|
| <input type="checkbox"/> Stove/Burner | _____ lbs. |
| <input type="checkbox"/> Fuel | _____ lbs. |
| <input type="checkbox"/> Pot/Cup | _____ lbs. |
| <input type="checkbox"/> Utensil | _____ lbs. |
| <input type="checkbox"/> Fire Kit** | _____ lbs. |
| <input type="checkbox"/> Bear Canister | _____ lbs. |

Personal Gear/Tool System:

- | | |
|--|------------|
| <input type="checkbox"/> Trekking Poles* | _____ lbs. |
| <input type="checkbox"/> Gaiters* | _____ lbs. |
| <input type="checkbox"/> Camp Chair* | _____ lbs. |
| <input type="checkbox"/> Knife | _____ lbs. |
| <input type="checkbox"/> Multi-tool | _____ lbs. |
| <input type="checkbox"/> Parachute Cord 50 ft. | _____ lbs. |
| <input type="checkbox"/> Repair Kit** | _____ lbs. |

Navigation/Electronics System:

- | | |
|---|------------|
| <input type="checkbox"/> Topo/Trail Map | _____ lbs. |
| <input type="checkbox"/> Compass | _____ lbs. |
| <input type="checkbox"/> GPS | _____ lbs. |
| <input type="checkbox"/> PLB & Sat. Messaging | _____ lbs. |

*Optional depending on temperature and weather conditions or your personal/team needs.
**Refer to the AcadianX Kit list

Total Base Weight: _____ lbs.

- Shell Layer _____ lbs.
 Sleep Clothes _____ lbs.
 Camp/Water Shoes* _____ lbs.

- Sanitizer _____ lbs.
 Trowel _____ lbs.
 Blue Bags _____ lbs.

Foot Care Kit: Total wt: _____ lbs.

- Leukotape _____ lbs.
 Duct Tape _____ lbs.
 Sawyer Blist-O-Bans _____ lbs.
 Benzoin _____ lbs.
 Foot Balm _____ lbs.

Kit Systems List

Fire Kit: Total wt: _____ lbs.

- Lighter/Ignition Source _____ lbs.
 Fire Starter _____ lbs.
 Bellow _____ lbs.

Repair Kit: Total wt: _____ lbs.

- Aquaseal _____ lbs.
 Super Glue _____ lbs.
 Duct Tape _____ lbs.
 Tenacious Tape Patches _____ lbs.
 Needle & Thread _____ lbs.
 Parachute Cord _____ lbs.
 Cable Ties _____ lbs.
 Replacement Parts _____ lbs.
 Spare Batteries _____ lbs.

Hygiene Kit: Total wt: _____ lbs.

- Toothbrush _____ lbs.
 Toothpaste _____ lbs.
 Floss/toothpick _____ lbs.
 Personal Wipes _____ lbs.

Battery Charging Kit: Total wt: _____ lbs.

- Portable Power Bank _____ lbs.
 Solar Panel _____ lbs.
 Charging Wires/Cords _____ lbs.

Hammock System: Total wt: _____ lbs.

- Tarp _____ lbs.
 Netting _____ lbs.
 Hammock _____ lbs.
 Under Quilt _____ lbs.
 Suspension System _____ lbs.

Tarp System: Total wt: _____ lbs.

- Tarp _____ lbs.
 Ground Pad _____ lbs.
 Bug Netting _____ lbs.
 Stakes _____ lbs.

*Use the total kit weight and add to your primary gear list.

Logistics

Travel

You can travel to the Kings Canyon by either plane or vehicle. The nearest airport to the park is either the Fresno International Airport or the Visalia Municipal Airport.

Departure Flight

Route: Lafayette (LFT) to Fresno (FAT)

Date: _____

Depart Time: _____

Arrival Time: _____

Flight Number: _____

Return Flight

Route: Fresno (FAT) to Lafayette (LFT)

Date: _____

Depart Time: _____

Arrival Time: _____

Flight Number: _____

Lodging

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

Hotel 1 Name: _____

Check-In Date: _____

Hotel 2 Name: _____

Check-In Date: _____

Hotel 3 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: _____

Pickup Date/Time: _____

Shuttle Plan

Shuttle Service: _____

Pickup Date/Time: _____

Gear Rental

Outfitter Service: _____

Pickup Date/Time: _____

Type of Gear: _____

Preparation & Training

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.

References

1. NPS Contributors. (2020, June 15). Retrieved from Sequoia & Kings Canyon National Park: <https://www.nps.gov/seki/index.htm>
2. Wikipedia contributors. (2020, June 15). *Kings Canyon National Park*. Retrieved from In Wikipedia, The Free Encyclopedia: https://en.wikipedia.org/w/index.php?title=Kings_Canyon_National_Park&oldid=956026078