



ACADIANX

Explore Your World

Death Valley National Park Loadout Package 2021



Death Valley Backpacking Expedition via Telescope Peak, Cottonwood/Marble Canyon

Information Compiled by the AcadianX Outdoor Adventure Group



Death Valley National Park

Death Valley National Park is an American national park that straddles the California–Nevada border, east of the Sierra Nevada. The park boundaries include Death Valley, the northern section of Panamint Valley, the southern section of Eureka Valley, and most of Saline Valley. The park occupies an interface zone between the arid Great Basin and Mojave deserts, protecting the northwest corner of the Mojave Desert and its diverse environment of salt-flats, sand dunes, badlands, valleys, canyons, and mountains. Death Valley is the largest national park in the contiguous United States, and the hottest, driest and lowest of all the national parks in the United States. The second-lowest point in the Western Hemisphere is in Badwater Basin, which is 282 feet (86 m) below sea level. More than 93% of the park is a designated wilderness area. The park is home to many species of plants and animals that have adapted to this harsh desert environment including creosote bush, Joshua tree, bighorn sheep, coyote, and the Death Valley pupfish, a survivor from much wetter times.

Telescope Peak

Telescope Peak is the highest point within Death Valley National Park, in the U.S. state of California. It is also the highest point of the Panamint Range, and lies in Inyo County. From atop this desert mountain one can see for over one hundred miles in many directions, including west to Mount Whitney, and east to Charleston Peak. The mountain was named for the great distance visible from the summit.

Ecosystems

Hear the words “Death Valley” and an image of an uninhabited landscape often comes to mind. Below-sea-level basins are ravaged by drought and heat, receiving less than two inches of rain per year. Temperatures soar above 100 degrees. While these conditions may seem harsh to humans, Death Valley is home to a great diversity of wildlife. Hard-learned, clever adaptations enable desert animals to thrive in this unlikely place.

Geology

There are two major valleys in the park, Death Valley and Panamint Valley. Both of these valleys were formed within the last few million years and both are bounded by north–south-trending mountain ranges. These and adjacent valleys follow the general trend of Basin and Range topography with one modification: there are parallel strike-slip faults that perpendicularly bound the central extent of Death Valley. The result of this shearing action is additional extension in the central part of Death Valley which causes a slight widening and more subsidence there.

Fees & Permits

Permits are highly recommended for all overnight Wilderness users. Filling out a permit provides park management information in case of a search and rescue and provides you with a handy list of rules you must follow while camping in Death Valley.

Regulations and Safety Considerations

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

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.

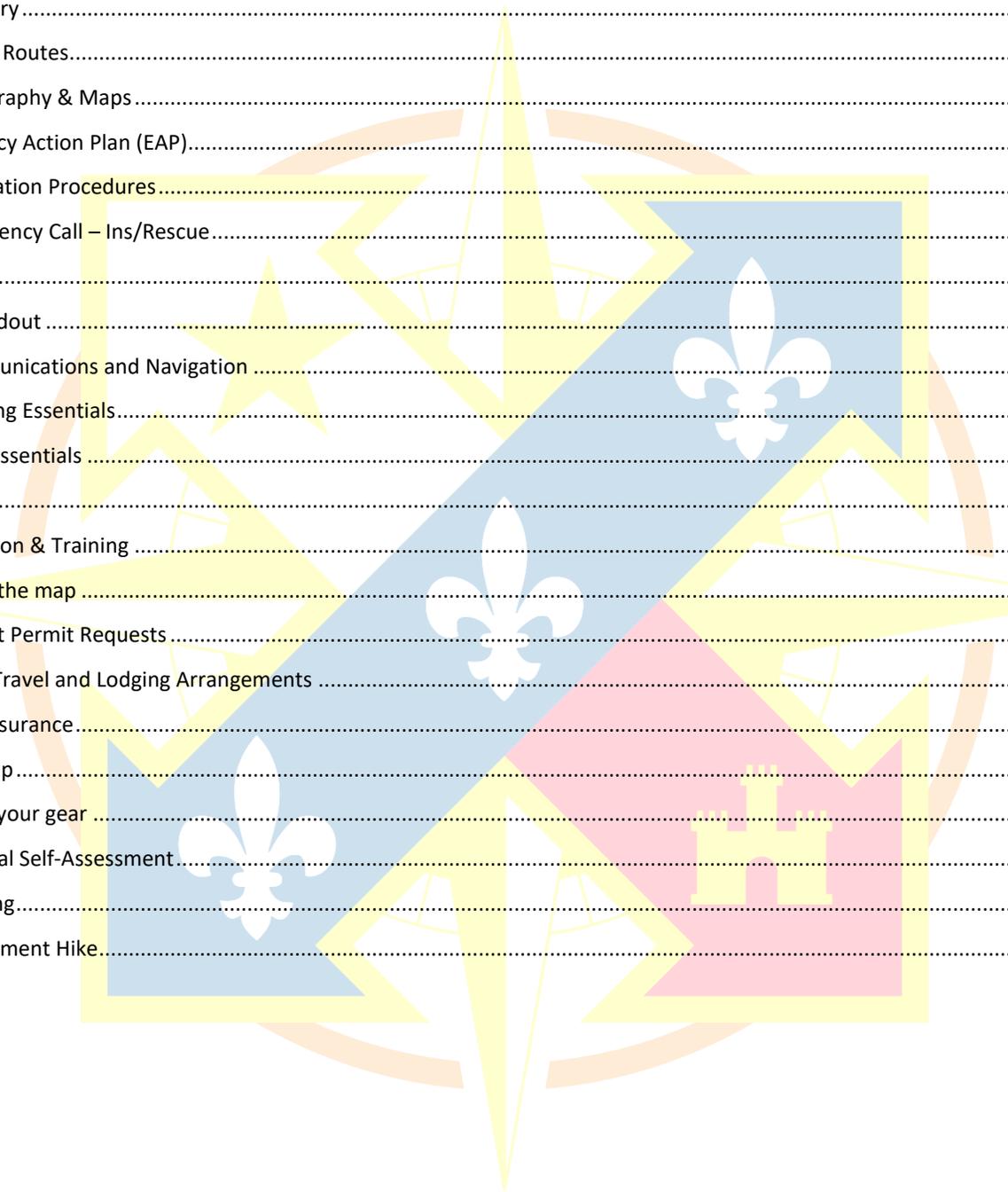
Logistics

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 Death Valley National Park

General Information

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Figure 1: Location of Death Valley in California.

A series of Native American groups inhabited the area from as early as 7000 BC, most recently the Timbisha around 1000 AD who migrated between winter camps in the valleys and summer grounds in the mountains. A group of European Americans, trapped in the valley in 1849 while looking for a shortcut to the gold fields of California, gave the valley its name, even though only one of their group died there. Several short-lived boom towns sprang up during the late 19th and early 20th centuries to mine gold and silver. The only long-term profitable ore to be mined was borax, which was transported out of the valley with twenty-mule teams. The valley later became the subject of books, radio programs, television series, and movies. Tourism expanded in the 1920s when resorts were built around Stovepipe Wells and Furnace Creek. Death Valley National Monument was declared in 1933 and the park was substantially expanded and became a national park in 1994.

The natural environment of the area has been shaped largely by its geology. The valley is actually a graben with the oldest rocks being extensively metamorphosed and at least 1.7 billion years old. Ancient, warm, shallow seas deposited marine sediments until rifting opened the Pacific Ocean. Additional sedimentation occurred until a subduction zone formed off the coast. The subduction uplifted the region out of the sea and created a line of volcanoes. Later the crust started to pull apart, creating the current Basin and Range landform. Valleys filled with sediment and, during the wet times of glacial periods, with lakes, such as Lake Manly.

In 2013, Death Valley National Park was designated as a dark sky park by the International Dark-Sky Association.



Figure 2: Sand Dunes in Death Valley NP.

Recreation

Hiking, Camping, 4-Wheel Drive

Sightseeing is available by personal automobile, four-wheel drive, bicycle, mountain bike (on established roadways only), and hiking. Riding through the park on motorcycle is also a popular pastime. State Route 190, the Badwater Road, the Scotty's Castle Road, and paved roads to Dante's View and Wildrose provide access to the major scenic viewpoints and historic points of interest. More than 350 miles (560 km) of unpaved and four-wheel-drive roads provide access to wilderness hiking, camping, and historical sites. All vehicles must be licensed and street legal. There are hiking trails of varying lengths and difficulties, but most backcountry areas are accessible only by cross-country hiking. There are thousands of hiking possibilities. The normal season for visiting the park

is from October 15 to May 15, avoiding summer extremes

in temperature. Costumed living history tours of the historic Death Valley Scotty's Castle were conducted for a fee but were suspended in October 2015 due to flood damage to the buildings and grounds. It is not expected to re-open until 2020.

There are nine designated campgrounds within the park, and overnight backcountry camping permits are available at the Visitor Center. Xanterra Parks & Resorts owns and operates a private resort, the Oasis at Death Valley,^[36] which comprises two separate and distinct hotels: the Inn at Death Valley is a four-star historic hotel, and the Ranch at Death Valley is a three-star ranch-style property reminiscent of the mining and prospecting days. Panamint Springs Resort is in the western part of the park. Death Valley Lodging Company operates the Stovepipe Wells Resort under a concession permit. There are a few motels near entrances to the park, in Shoshone, Death Valley Junction, Beatty, and Pahrump.

Furnace Creek Visitor Center is located on CA-190. A 22-minute introductory slide program is shown every 30 minutes. During the winter season—November through April—rangers offer interpretive tours and a wide variety of walks, talks, and slide presentations about Death Valley cultural and natural history. The visitor center has displays dealing with the park's geology, climate, wildlife and natural history. There are also specific sections dealing with the human history and pioneer experience. The Death Valley Natural History Association maintains a bookstore specifically geared to the natural and cultural history of the park.



Figure 3: A 360-degree panorama of Racetrack Playa at night. The Milky Way is visible as an arc in the center.

is from October 15 to May 15, avoiding summer extremes

The northeast corner of Saline Valley has several developed hot spring pools. The pools can be accessed by driving on the unpaved Saline Valley Road for several hours, or by flying a personal aircraft to the Chicken Strip—an uncharted airstrip a short walk from the springs.

Stargazing

Death Valley National Park is a popular location for stargazing as it has one of the darkest night skies in the United States. Despite its remote location, air quality and night visibility are threatened by civilization. In particular, light pollution is introduced by nearby Las Vegas. The darkest skies are, in general, located in the northwest of the park. The northwestern area of the park, including sites such as Ubehebe Crater, is a Bortle class 1 or "excellent dark sky" site. The Andromeda Galaxy and the Triangulum Galaxy are visible to the unaided eye under these conditions, and the Milky Way casts shadows; optical phenomena such as zodiacal light or "false dawn" and gegenschein are also visible to the unaided eye under these conditions. Most southern regions of the park are Bortle class 2 or "average dark sky" sites.

History

Early Inhabitants and Transient Populations

Four Native American cultures are known to have lived in the area during the last 10,000 years. The first known group, the Nevares Spring People, were hunters and gatherers who arrived in the area perhaps 9,000 years ago (7000 BC) when there were still small lakes in Death Valley and neighboring Panamint Valley. A much milder climate persisted at that time, and large game animals were still plentiful. By 5,000 years ago (3000 BC) the Mesquite Flat People displaced the Nevares Spring People. Around 2,000 years ago the Saratoga Spring People moved into the area, which by then was probably already a hot, dry desert. This culture was more advanced at hunting and gathering and was skillful at handcrafts. They also left mysterious stone patterns in the valley.

One-thousand years ago, the nomadic Timbisha (formerly called Shoshone and also known as Panamint or Koso) moved into the area and hunted game and gathered mesquite beans along with pinyon pine nuts. Because of the wide altitude differential between the valley bottom and the mountain ridges, especially on the west, the Timbisha practiced a vertical migration pattern. Their winter camps were located near water sources in the valley bottoms. As the spring and summer progressed and the weather warmed, grasses and other plant food sources ripened at progressively higher altitudes. November found them at the very top of the mountain ridges where they harvested pine nuts before moving back to the valley bottom for winter.



Figure 4: Petroglyphs above Mesquite Springs.

The California Gold Rush brought the first people of European descent known to visit the immediate area. In December 1849 two groups of California Gold Country-bound travelers with perhaps 100 wagons total stumbled into Death Valley after getting lost on what they thought was a shortcut off the Old Spanish Trail. Called the Bennett-Arcane Party, they were unable to find a pass out of the valley for weeks; they were able to find fresh water at various springs in the area but were forced to eat several of their oxen to survive. They used the wood of their wagons to cook the meat and make jerky. The place where they did this is today referred to as "Burned Wagons Camp" and is located near the sand dunes.

After abandoning their wagons, they eventually were able to hike out of the valley. Just after leaving the valley, one of the women in the group turned and said, "Goodbye Death Valley," giving the valley they endured its name. Included in the party was William Lewis Manly whose autobiographical book *Death Valley* in '49 detailed this trek and popularized the area (geologists later named the prehistoric lake that once filled the valley after him).

Boom and Bust

The ores that are most famously associated with the area were also the easiest to collect and the most profitable: evaporite deposits such as salts, borate, and talc. Borax was found by Rosie and Aaron Winters near The Ranch at Death Valley (then called Greenland) in 1881. Later that same year, the Eagle Borax Works became Death Valley's first commercial borax operation. William Tell Coleman built the Harmony Borax Works plant and began to process ore in late 1883 or early 1884, continuing until 1888. This mining and smelting company produced borax to make soap and for industrial uses. The end product was shipped out of the valley 165 miles (266 km) to the Mojave railhead in 10-ton-capacity wagons pulled by "twenty-mule teams" that were actually teams of 18 mules and two horses each.



Figure 5: Historical locomotive for transporting borax in Death Valley.

The teams averaged two miles (3 km) an hour and required about 30 days to complete a round trip. The trade name 20-Mule Team Borax was established by Francis Marion Smith's Pacific Coast Borax Company after

Smith acquired Coleman's borax holdings in 1890. A memorable advertising campaign used the wagon's image to promote the Boraxo brand of granular hand soap and the Death Valley Days radio and television programs. In 1914, the Death Valley Railroad was built to serve mining operations on the east side of the valley. Mining continued after the collapse of Coleman's empire, and by the late 1920s the area was the world's number one source of borax. Some four to six million years old, the Furnace Creek Formation is the primary source of borate minerals gathered from Death Valley's playas.



Figure 6: A twenty-mule team in Death Valley.

Other visitors stayed to prospect for and mine deposits of copper, gold, lead, and silver. These sporadic mining ventures were hampered by their remote location and the harsh desert environment. In December 1903, two men from Ballarat were prospecting for silver. One was an out-of-work Irish miner named Jack Keane and the other was a one-eyed Basque butcher named Domingo Etcharren. Quite by accident, Keane discovered an immense ledge of free-milling gold by the duo's work site and named the claim the Keane Wonder Mine. This started a minor and short-lived gold rush into the area. The Keane Wonder Mine, along with mines at Rhyolite, Skidoo and Harrisburg, were the only ones to extract enough metal ore to make them worthwhile. Outright shams such as Leadfield also occurred, but most ventures quickly ended after a short series of prospecting mines failed to yield evidence of significant ore (these mines now dot the entire area and are a significant hazard to anyone who enters them). The boom towns which sprang up around these mines flourished during the 1900s (decade) but soon declined after the Panic of 1907.

Early Tourism

The first documented tourist facilities in Death Valley were a set of tent houses built in the 1920s where Stovepipe Wells is now located. People flocked to resorts built around natural springs thought to have curative and restorative properties. In 1927, Pacific Coast Borax turned the crew quarters of its Furnace Creek Ranch into a resort, creating the Furnace Creek Inn and resort. The spring at Furnace Creek was harnessed to develop the resort, and as the water was diverted, the surrounding marshes and wetlands started to shrink.



Figure 7: Scotty's Castle under construction.

Soon the valley was a popular winter destination. Other facilities started off as private getaways but were later opened to the public. Most notable among these was Death Valley Ranch, better known as Scotty's Castle. This large ranch home built in the Spanish Revival style became a hotel in the late 1930s and, largely because of the fame of Death Valley Scotty, a tourist attraction. Death Valley Scotty, whose real name was Walter Scott, was a gold miner who pretended to be owner of "his castle", which he claimed to have built with profits from his gold mine. Neither claim was true, but the real owner, Chicago millionaire Albert Mussey Johnson, encouraged the myth. When asked by reporters what his connection was to Walter Scott's castle, Johnson replied that he was Mr. Scott's banker.

Protection and Later History

President Herbert Hoover proclaimed a national monument in and around Death Valley on February 11, 1933, setting aside almost two million acres (8,000 km²) of southeastern California and small parts of Nevada.



Figure 8: Civilian Conservation Corps workers in Death Valley.

The Civilian Conservation Corps (CCC) developed infrastructure in Death Valley National Monument during the Great Depression and on into the early 1940s. The CCC built barracks, graded 500 miles (800 km) of roads, installed water and telephone lines, and total of 76 buildings. Trails in the Panamint Range were built to points of scenic interest, and an adobe village, laundry and trading post were constructed for the Timbisha Shoshone Tribe. Five campgrounds, restrooms, an airplane landing field and picnic facilities were also built.

Creation of the monument resulted in a temporary closing of the lands to prospecting and mining. However, Death Valley was quickly reopened to mining by Congressional action in June 1933. As improvements in mining technology allowed lower grades of ore to be processed, and new heavy equipment allowed greater amounts of rock to be moved, mining in Death Valley changed. Gone were the days of the "single-blanket, jackass prospector" long associated with the romantic west. Open pit and strip mines scarred the landscape as international mining corporations bought claims in highly visible areas of the national monument. The public outcry that ensued led to greater protection for all national park and monument areas in the United States. In 1976, Congress passed the Mining in the Parks Act, which closed Death Valley National Monument to the filing of new mining claims, banned open-pit mining and required the National Park Service to examine the validity of tens of thousands of pre-1976 mining claims. Mining was allowed to resume on a limited basis in 1980 with stricter environmental standards.

Death Valley National Monument was designated a biosphere reserve in 1984. On October 31, 1994, the

monument was expanded by 1.3 million acres (5,300 km²) and re-designated as a national park, via congressional passage of the California Desert Protection Act (Public Law 103-433). Consequently, the elevated status for Death Valley made it the largest national park in the contiguous United States. On March 12, 2019, the John D. Dingell, Jr. Conservation, Management, and Recreation Act added 35,292 acres (55 sq mi; 143 km²) to the park.

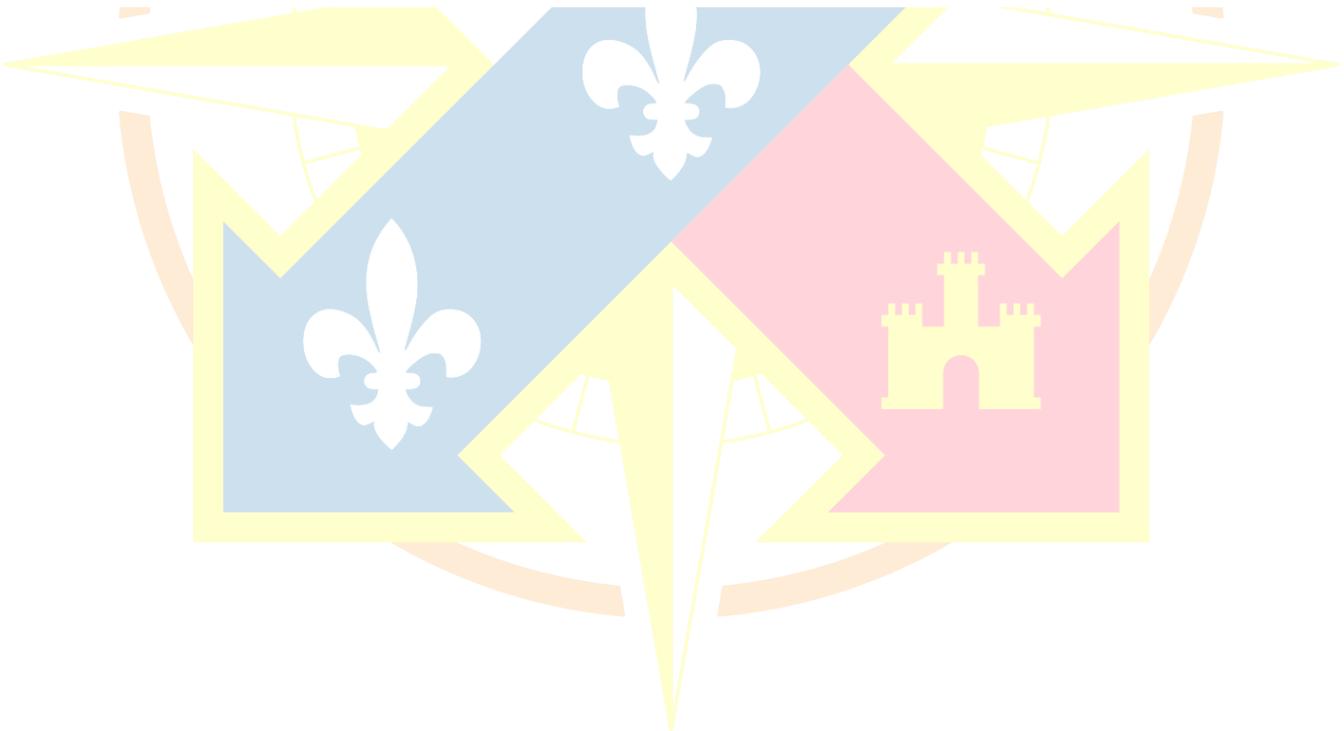
Many of the larger cities and towns within the boundary of the regional ground water flow system that the park and its plants and animals rely upon are experiencing

some of the fastest growth rates of any place in the United States. Notable examples within a 100-mile (160 km) radius of Death Valley National Park include Las Vegas and Pahrump, Nevada. In the case of Las Vegas, the local Chamber of Commerce estimates that 6,000 people are moving to the city every month. Between 1985 and 1995, the population of the Las Vegas Valley increased from 550,700 to 1,138,800.

In 1977, parts of Death Valley were used by director George Lucas as a filming location for Star Wars, providing the setting for the fictional planet Tatooine.



Figure 9: Telescope and Wildrose Peaks from Emigrant Canyon Road.



Plant Life



Figure 10: Death Valley has more than 1,000 described plant species ranging from ancient bristlecone pines to ephemeral spring wildflowers.

Despite its reputation as a lifeless wasteland, Death Valley National Park contains a great diversity of plants. The park covers over 3 million acres of Mojave and Great Basin desert terrain, with elevations ranging from 282 feet below sea level at Badwater Basin to 11,049 feet on the summit of Telescope Peak. Annual precipitation varies from 1.9 inches on the valley floor to over 15 inches in the higher mountains.

Vegetation zones include creosote bush, desert holly, and mesquite at the lower elevations up through shadscale, blackbrush, Joshua tree, pinyon-juniper, to sub-alpine limber pine and bristlecone pine woodlands. The saltpan is devoid of vegetation, and the rest of the valley floor and lower slopes have sparse cover, yet where water is available, an abundance of vegetation is usually present.

Cacti / Desert Succulents



The Mojave Desert is rich with cacti and succulent species, yet in Death Valley National Park they are scarce due to the extremes of heat, dryness, and soil salinity. Even so, cactus grow from an elevation of 400 feet above sea level to the summits of the surrounding mountains.

Cacti most commonly seen are cottontop barrel, silver cholla, and beavertail cactus. Engelmann hedgehog cactus

are locally abundant above 3000 feet elevation. Grizzly bear prickly pear is the most common species in the pinyon-juniper woodlands.

Joshua trees--the indicator species of the Mojave Desert--are found in only a few locations here. The Lee Flat area contains the finest stand in the park.

In contrast to other succulent species, pickleweed is very salt-tolerant and can be found in marshy areas below sea level.

Wildflowers

The opportunity to a spectacular wildflower show is a big draw to Death Valley. About once a decade the park can experience carpets of wildflowers known as a superbloom, which is a very rare but amazing sight! Even on normal bloom years, early spring months can bring smaller pockets of flowers to the desert floor, and later to the mid- and high-elevations.

Desert Gold

Eschscholzia glyptosperma

This is a slender daisy-like flower with 1/2-1 inch long yellow ray flowers ("petals"), growing up to one foot in height. Leaves grow only at the base, and are dissected with pointed lobes. It favors flats, slopes, and alluvial fans below 5,000' in creosote brush scrub and Joshua tree woodlands habitats.



Figure 11: Desert Gold - NPS Photo

Desert Marigold*Baileya multiradiata*

The desert marigold is a 8 to 20 inch tall perennial with white-wooly stems that branch from a taproot. The flowers are about 1 inch diameter heads with numerous yellow, hairy disk flowers, and 50-60 bright yellow ray flowers ("petals") arranged in rows. They flower beginning in April and sometimes into July, growing around the Towne Pass area from 2,000 to 5,000'.



Figure 12: Desert Marigold - NPS Photo

Eureka Dunes Evening Primrose*Oenothera californica ssp. eurekaensis*

This rare, and federally endangered, perennial flower is found on the Eureka Valley sand dunes in the northern area of Death Valley National Park. Up to two feet tall, with a well anchored root system, and the ability to resprout from stem tips buried in the sand this plant is well adapted to life on the dunes. It flowers April through June, growing large white flowers with four 1 inch long petals. Finding a Eureka Dunes Evening Primrose is a truly special and unique Death Valley experience.



Figure 13: Eureka Dunes Evening Primrose

Grape Soda Lupine*Lupinus excubitus*

This handsome lupine species grows to three feet high and has alternate, palmately divided leaves that take on a silvery color due to dense flattened hairs on their surface. It flowers in the spring from April until June, with blue-violet flowers in branched clusters. It can be found in rocky soils from 3,000 to 7,000 feet and is common on the western slope of the Panamint range.



Figure 14: Grape Soda Lupine

Desert Star*Monoptilon bellioides*

The desert star is a small annual that reaches only 6 inches tall. It is covered with stubby hairs, has linear half inch long leaves, and flower heads composed of numerous yellow disk flowers and 12-20 white ray flowers. This flower is common on sandy and gravelly flats and washes below 3,000 feet in creosote bush scrub.



Figure 15: Desert Star

Wavyleaf Desert Paintbrush

Castilleja applegatei

Common in the Telescope peak area, The Wavyleaf Desert Paintbrush is easily recognized during the spring bloom by its bright red paintbrush shaped flowers. It is a short perennial with sticky, wavy edged leaves and grows at upper elevations.



Figure 16: Wavyleaf Desert Paintbrush

Mariposa lily

Calochortus kennedy

The Mariposa lily is a 4 to 8 inch tall perennial, with up to 8 inch long linear leaves that remain coiled on the ground before the flowering stalk appears. Each plant produces 1 or 2 open, bell-shaped, vermillion flowers with three 1-2 inch-long petals with purplish spots and round fringed glands at the base. You can find these beautiful flowers between 2,000 and 6,500 feet in creosote bush scrub, Joshua tree woodland, and pinyon-juniper woodland between shrubs in rocky soil.



Figure 17: Mariposa Lily

Desert Trumpet

Eriogonum inflatum

This unique perennial flower has stout, bluish green stems that form inflated, hollow, bulbs at the node. The stems above this inflated node have a forked branching pattern characteristic of the buckwheat family. These stems are capped with a tiny yellow flower cluster that blooms in the spring, from March to July. These are very common on gravelly washes and flats below 6,000 feet. A variation of this plant exists in Death Valley that lacks the inflated stem, known by the scientific name of *Eriogonum inflatum* var. *contiguum*.



Figure 18: Desert Trumpet

Animal Life

Hear the words “Death Valley” and an image of an uninhabited landscape often comes to mind. Below-sea-level basins are ravaged by drought and heat, receiving less than two inches of rain per year. Temperatures soar above 100 degrees. While these conditions may seem harsh to humans, Death Valley is home to a great diversity of wildlife. Hard-learned, clever adaptations enable desert animals to thrive in this unlikely place.



Figure 19: Desert Bighorn Sheep climbing mountain slopes.

Death Valley is one of the driest places on earth. Habitats with fresh water can be difficult to find, so some desert animals have evolved to simply drink less water. Roaming through mountains and canyons, bighorn sheep are able to go without water for several days and can lose up to a third of their body weight due to dehydration. When water becomes available again, the sheep can drink several gallons at a time and are able to fully recover.

Like bighorn sheep, kangaroo rats do not have to worry about dehydration. In fact, they are so perfectly adapted to arid environments, they do not need to drink water their entire lives! They can survive on water digested from their seedy, vegetarian diet. Kangaroo rats conserve their body's precious water by releasing wastes in very concentrated urine and dry feces.



Figure 20: Desert tortoise can live up to 80 years, yet most of their lives are spent sleeping in underground burrows. NPS - Robb Hannawacker

While finding enough water is a challenge, coping with the fierce summer heat is a constant concern for desert inhabitants. The desert tortoise is a champion of avoiding the heat. Unable to regulate its own temperature, the tortoise spends most of the year in its burrow. Underground, it is protected from extreme weather. During the hottest times, tortoises estivate, or enter a state of dormancy that allows them to conserve energy and save water. Additionally, desert tortoises survive frigid winter temperatures by hibernating. Depending on the weather, desert tortoises might be active above ground for only three months of the year!

Rather than “sleep” through most of the year, many animals rest during the hot summer days and are active at night. Nocturnal wildlife leaves behind clues on sand dunes. For example, you may find coyote tracks alongside those of a jackrabbit. The rabbit's tracks zig and zag across the sand while the long strides of the coyote's tracks portray a fast run. Hunting during the cool nights and early mornings allows the coyote to spend more energy catching prey. The cover of darkness also helps the jackrabbit hide from potential predators.

While there are advantages in being nocturnal in the desert, there are still creatures who brave the daytime heat. Commonly seen animals have specific physical adaptations which allow them to be out in the heat longer.

Roadrunners, for instance, can operate in the heat of the day because their body temperatures are naturally high (104 degrees).



Figure 21: Jackrabbits use their big ears to cool their body temperature in hot weather. NPS - K Monroe

The jackrabbit, another common desert creature, stays cool by releasing heat from its over-sized ears. When the rabbit retreats into the shade, warm blood from its core circulates through blood vessels in its ears, where heat is lost to the surrounding air.

Desert living is no easy task, but all animals that make their home in Death Valley have found a way to survive and thrive. Their adaptations overcome the daily challenges of finding food, water, and staying cool. “Helping” an animal by giving it food or other interactions can disrupt its way of life and usually does more harm than good. Desert dwellers are perfectly designed to live in Death Valley National Park. It is important that humans, as visitors to these creatures’ home, respectfully observe and enjoy from a distance.

Mammal List

BATS

- **fringed myotis**
Myotis thysanodes
Roosts in caves, mines, and buildings; juniper forests and desert shrub.
- **California myotis**
Myotis californicus
Roosts in caves, mine tunnels and buildings.
- **small-footed myotis**
Myotis subulatus
Roosts in caves, mine tunnels and rock crevices.
- **silver-haired bat**
Lasiorycteris noctivagans
Found around water in forested areas.
- **western pipistrelle**
Pipistrellus hesperus
Roosts in rock crevices and caves near watercourses.
- **western big-eared bat**
Plecotus townsendii
Found in abandoned mine tunnels and shafts from 3000 to 6000 feet.
- **hoary bat**
Lasiurus cinereus
Roosts in trees; found around well-watered areas.
- **pallid bat**
Antrozous pallidus
Roosts in crevices and caves.
- **Brazilian free-tailed bat**
Tadarida brasiliensis
Roosts in caves, crevices, and buildings.



desert kangaroo rat

SMALL MAMMALS

- **desert shrew**
Notiosorex crawfordi
Found in sagebrush; sometimes in masses of vegetation at the base of desert plants.
- **panamint pocket gopher**
Thomomys umbrinus scapterus
Panamint and Grapevine Mountains.
- **pygmy pocket gopher**
Thomomys umbrinus oreocus
Higher elevations in surrounding mountains; up to 10,000 feet on Telescope Peak.
- **great basin pocket mouse**
Perognathus parvus
Grapevine Mountains.
- **little pocket mouse**
Perognathus longimembris
Sage habitat at Harrisburg Flat.
- **long-tailed pocket mouse**
Perognathus formosus mohavensis
Grapevine Mountains.
- **desert pocket mouse**
Perognathus penicillatus
Mesquite Flat.
- **chisel-toothed kangaroo rat**
Dipodomys microps
Harrisburg Flat in dry, sandy soil with sparse vegetation.
- **panamint kangaroo rat**
Dipodomys panamintinus
Northern Panamint Mountains between 6000 and 7000 feet.
- **Merriam kangaroo rat**
Dipodomys merriami
Dry, sandy soil on the valley floor.
- **desert kangaroo rat**
Dipodomys deserti
Dry locations on valley, especially around mesquite.
- **western harvest mouse**
Reithrodontomys megalotis
Well watered areas; Salt Creek, Furnace Creek, Hanaupah Canyon, Wildrose.
- **cactus mouse**
Peromyscus eremicus
Higher elevations in Grapevine and Cottonwood Mountains.
- **deer mouse**
Peromyscus maniculatis
Valley floor and mountains.
- **canyon mouse**
Peromyscus crinitus
Mountains and rocky canyons.
- **brush mouse**
Peromyscus boylii
Northern Panamint Mountains.
- **pinon mouse**
Peromyscus truei
Rocky areas in pinyon-juniper belt.
- **southern grasshopper mouse**
Onychomys torridus
Throughout Death Valley below 5500 feet.
- **desert woodrat**
Neotoma lepida
From salt marshes into surrounding mountains.
- **bushy-tailed woodrat**
Neotoma cinerea
Pinyon-juniper area of northern Panamint Mountains.
- **house mouse**
Mus musculus
In and around human dwellings.



Figure 22: Desert Kangaroo Rat



Figure 24: desert cottontail, NPS Photo - Cookie Ballou



Figure 23: whitetail antelope squirrel

SQUIRRELS

- **panamint chipmunk**
Eutamias panamintinus
Pinyon-juniper belt of Panamint and Grapevine Mountains.
- **whitetail antelope squirrel**
Ammospermophilus leucurus
Mesquite hummocks of valley floor to over 6000 feet in mountains; common along roadsides.
- **California ground squirrel**
Citellus beecheyi
Hunter Mountain area of Cottonwood Mountains.
- **roundtail ground squirrel**
Citellus tereticaudus
Low desert; mesquite thickets near Furnace Creek; common along roadsides.
- **mojave ground squirrel**
Citellus mohavensis
Inhabits gentle slopes in Wingate Wash area.

MEDIUM MAMMALS

- **mountain cottontail**
Sylvilagus nuttalli
Surrounding mountains.
- **desert cottontail**
Sylvilagus audobonii
Mesquite thickets on valley floor.
- **black-tailed jackrabbit**
Lepus californicus
Near valley floor and in mountains.
- **porcupine**
Erethizon dorsatum
Grapevine, Panamint, and Cottonwood Mountains.



Figure 25: Bobcat

CARNIVORES

- **coyote**
Canis latrans

From salt flats into mountains; common around mesquite thickets.

- **kit fox**

Vulpes macrotis arsipus

Nocturnal; common throughout most of Death Valley; Sand Dunes and Furnace Creek.

- **gray fox**

Urocyon cinereoargenteus

East side of Grapevine Mountains.

- **badger**

Taxidea taxus

Low desert into mountains; Daylight Pass.

- **spotted skunk**

Spilogale gracilis

Mountains surrounding Death Valley.

- **ringtail**

Bassariscus astutus

Nocturnal; rocky terrain in arid brush and tree areas.

- **mountain lion**

Puma concolor

Surrounding mountains; occasional winter visitors to desert oasis.

- **bobcat**

Lynx rufus

From sea level into mountains.



Figure 26: desert bighorn sheep

HOOFED MAMMALS

- **burro**

Equus assinus

(An introduced species)

Introduced in the 1880's; Panamint, Cottonwood, and Grapevine Mountains.

- **horse**

Equus caballus

(An introduced species)

Introduced; Hunter Mountain, Cottonwood Basin, Pinto Peak, Grapevine Mountains.

- **mule deer**

Odocoileus hemionus

Along eastern and western boundaries of the park in Panamint, Cottonwood, and Grapevine Mountains.

- **desert bighorn sheep**

Ovis canadensis nelsoni

Throughout Death Valley at all elevations; inaccessible ridges and canyons, usually near water.

Geography and Geology

Geography

There are two major valleys in the park, Death Valley and Panamint Valley. Both of these valleys were formed within the last few million years and both are bounded by north-south-trending mountain ranges. These and adjacent valleys follow the general trend of Basin and Range topography with one modification: there are parallel strike-slip faults that perpendicularly bound the central extent of Death Valley. The result of this shearing action is additional extension in the central part of Death Valley which causes a slight widening and more subsidence there.

Uplift of surrounding mountain ranges and subsidence of the valley floor are both occurring. The uplift on the Black Mountains is so fast that the alluvial fans (fan-shaped deposits at the mouth of canyons) there are small and steep compared to the huge alluvial fans coming off the Panamint Range. Fast uplift of a mountain range in an arid environment often does not allow its canyons enough time to cut a classic V-shape all the way down to the stream bed. Instead, a V-shape ends at a slot canyon halfway down, forming a 'wine glass canyon.' Sediment is deposited on a small and steep alluvial fan.

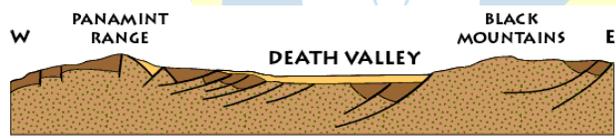


Figure 27: The Death Valley basin is filled with sediment (light yellow) eroded from the surrounding mountains. Black lines show some of the major faults that created the valley.

At 282 feet (86 m) below sea level at its lowest point, Badwater Basin on Death Valley's floor is the second-lowest depression in the Western Hemisphere (behind Laguna del Carbón in Argentina), while Mount Whitney, only 85 miles (137 km) to the west, rises to 14,505 feet (4,421 m). This topographic relief is the greatest elevation gradient in the contiguous United States and is the terminus point of the Great Basin's southwestern

drainage. Although the extreme lack of water in the Great Basin makes this distinction of little current practical use, it does mean that in wetter times the lake that once filled Death Valley (Lake Manly) was the last stop for water flowing in the region, meaning the water there was saturated in dissolved materials. Thus, the salt pans in Death Valley are among the largest in the world and are rich in minerals, such as borax and various salts and hydrates. The largest salt pan in the park extends 40 miles (64 km) from the Ashford Mill Site to the Salt Creek Hills, covering some 200 square miles (520 km²) of the valley floor. The best known playa in the park is the Racetrack, known for its moving rocks.

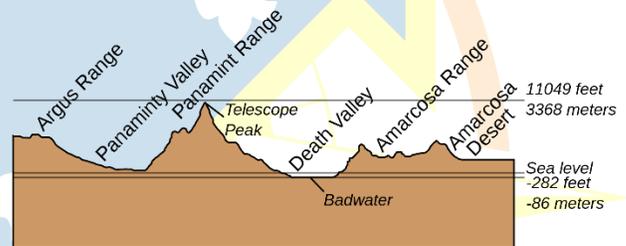


Figure 28: A cross section through the highest and lowest points in Death Valley National Park

Geology

The park has a diverse and complex geologic history. Since its formation, the area that comprises the park has experienced at least four major periods of extensive volcanism, three or four periods of major sedimentation, and several intervals of major tectonic deformation where the crust has been reshaped. Two periods of glaciation (a series of ice ages) have also had effects on the area, although no glaciers ever existed in the ranges now in the park.

Basement and Pahrump Group

Little is known about the history of the oldest exposed rocks in the area due to extensive metamorphism (alteration of rock by heat and pressure). Radiometric dating gives an age of 1,700 million years for the

metamorphism during the Proterozoic. About 1,400 million years ago a mass of granite now in the Panamint Range intruded this complex. Uplift later exposed these rocks to nearly 500 million years of erosion.



Figure 29: The Noonday Dolomite was formed as a carbonate shelf after the break-up of Rodinia.

The Proterozoic sedimentary formations of the Pahrump Group were deposited on these basement rocks. This occurred following uplift and erosion of any earlier sediments from the Proterozoic basement rocks. The Pahrump is composed of arkose conglomerate (quartz clasts in a concrete-like matrix) and mudstone in its lower part, followed by dolomite from carbonate banks topped by algal mats as stromatolites, and finished with basin-filling sediment derived from the above, including possible glacial till from the hypothesized Snowball Earth glaciation. The very youngest rocks in the Pahrump Group are basaltic lava flows.

Rifting and Deposition

A rift opened and subsequently flooded the region as part of the breakup of the supercontinent Rodinia in the Neoproterozoic (by about 755 million years ago) and the creation of the Pacific Ocean. A shoreline similar to the present Atlantic Ocean margin of the United States lay to the east. An algal mat-covered carbonate bank was deposited, forming the Noonday Dolomite. Subsidence of the region occurred as the continental crust thinned and the newly formed Pacific widened, forming the Ibex

Formation. An angular unconformity (an uneven gap in the geologic record) followed.

A true ocean basin developed to the west, breaking all the earlier formations along a steep front. A wedge of clastic sediment then began to accumulate at the base of the two underwater precipices, starting the formation of opposing continental shelves. Three formations developed from sediment that accumulated on the wedge. The region's first known fossils of complex life are found in the resulting formations. Notable among these are the Ediacara fauna and trilobites, the evolution of the latter being part of the Cambrian Explosion of life.

The sandy mudflats gave way about 550 million years ago to a carbonate platform (similar to the one around the present-day Bahamas), which lasted for the next 300 million years of Paleozoic time (refer to the middle of the timescale image). Death Valley's position was then within ten or twenty degrees of the Paleozoic equator. Thick beds of carbonate-rich sediments were periodically interrupted by periods of emergence. Although details of geography varied during this immense interval of time, a north-northeasterly trending coastline generally ran from Arizona up through Utah. The resulting eight formations and one group are 20,000 feet (6 km) thick and underlay much of the Cottonwood, Funeral, Grapevine, and Panamint ranges.

Compression and Uplift

In the early-to-mid- Mesozoic the western edge of the North American continent was pushed against the oceanic plate under the Pacific Ocean, creating a subduction zone. A subduction zone is a type of contact between different crustal plates where heavier crust slides below lighter crust. Erupting volcanoes and uplifting mountains were created as a result, and the coastline was pushed to the west. The Sierran Arc started to form to the northwest from heat and pressure generated from subduction, and compressive forces caused thrust faults to develop.

A long period of uplift and erosion was concurrent with and followed the above events, creating a major unconformity, which is a large gap in the geologic record. Sediments worn off the Death Valley region were carried

both east and west by wind and water. No Jurassic- to Eocene-aged sedimentary formations exist in the area, except for some possibly Jurassic-age volcanic rocks (see the top of the timescale image).



Figure 30: The Lake Manly lake system as it might have looked during its last maximum extent 22,000 years ago.

Stretching and Lakes

Basin and Range-associated stretching of large parts of crust below southwestern United States and northwestern Mexico started around 16 million years ago and the region is still spreading. This stretching began to affect the Death and Panamint valleys area by 3 million years ago. Before this, rocks now in the Panamint Range were on top of rocks that would become the Black Mountains and the Cottonwood Mountains. Lateral and vertical transport of these blocks was accomplished by movement on normal faults. Right-lateral movement along strike-slip faults that run parallel to and at the base of the ranges also helped to develop the area.[48] Torsional forces, probably associated with northwesterly movement of the Pacific Plate along the San Andreas Fault (west of the region), is responsible for the lateral movement.

Igneous activity associated with this stretching occurred from 12 million to 4 million years ago. Sedimentation is

concentrated in valleys (basins) from material eroded from adjacent ranges. The amount of sediment deposited has roughly kept up with this subsidence, resulting in retention of more or less the same valley floor elevation over time.

Pleistocene ice ages started 2 million years ago and melt from alpine glaciers on the nearby Sierra Nevada Mountains fed a series of lakes that filled Death and Panamint valleys and surrounding basins (see the top of the timescale image). The lake that filled Death Valley was the last of a chain of lakes fed by the Amargosa and Mojave Rivers, and possibly also the Owens River. The large lake that covered much of Death Valley's floor, which geologists call Lake Manly, started to dry up 10,500 years ago. Saltpans and playas were created as ice age glaciers retreated, thus drastically reducing the lakes' water source. Only faint shorelines are left.



Figure 31: During very wet periods, the Amargosa River can flow at the surface, as it did in February 2005.

Telescope Peak

Telescope Peak is also notable for having one of the greatest vertical rises above local terrain of any mountain in the contiguous United States. Its summit rises 11,331 feet (3,454 m) above the lowest point in Death Valley, Badwater Basin at -279 feet (-85 m), in about 15 miles (24 km), and about 10,000 feet (3,000 m) above the floor of Panamint Valley in about 8 miles (13 km). This is comparable to the rises of other tall, but better known, U.S. peaks. It is even somewhat comparable to the rise of

Mount Everest above its northern base on the Tibetan Plateau, a rise of roughly 13,000 feet (4,000 m). However, Everest rises much more, and much more steeply, above its southern base in Nepal.

Since it is the high point of a range surrounded by low basins, Telescope Peak also has a particularly high

topographic prominence of 6,168 feet (1,880 m), ranking it 22nd in the contiguous US by that measure.

A variety of trees can be found on the mountain, including single-leaf pinyon (*Pinus monophylla*), limber pine (*Pinus flexilis*), and, at the highest elevations, the ancient Great Basin bristlecone pine (*Pinus longaeva*).



Figure 32: Telescope Peak from trail out of Mahogany Flat Campground (the summit is to the left of the highest apparent peak in the image).

Era	Rock Units/Formations	Principal Geologic Events
Cenozoic	Alluvial fans, stream, and playa deposits, dunes, numerous sedimentary, volcanic, and plutonic units in separate and interconnected basins and igneous fields (includes Artist Drive, Furnace Creek, Funeral, and Nova Formations).	Major unconformity, continued deposition in modern Death Valley, opening of modern Death Valley, continuing development of present ranges and basins, onset of major extension.
Mesozoic	Granitic plutons, Butte Valley	Thrust faulting and intrusion of plutons related to Sierra Nevada batholith; shallow marine deposition; unconformity.
Paleozoic	Resting spring Shale, Tin Mountain Limestone, Lost Burro, Hidden Valley Dolomite, Eureka Quartzite, Nopah, Bonanza King, Carrara, Zabriskie Quartzite, Wood Canyon.	Development of a long-continuing carbonate bank on a passive continental margin; numerous intervals of emergence, interrupted by deposition of a blanket of sandstone in Middle Ordovician time. Deposition of a wedge of siliciclastic sediment during and immediately following the rifting along a new continental margin.
Proterozoic	Crystalline basement, Pahrump, Stirling Quartzite, Johnnie, Ibex, Noonday Dolomite, Kingston Peak, Beck Spring, Crystal Spring.	Regional metamorphism, Major unconformity, rapid uplift and erosion, shallow marine deposition, glacio-marine deposition, unconformity. Shallow to deep marine deposition along an incipient continental margin.

Average Climate

Average Temperatures and Precipitation

According to the Köppen climate classification system, Death Valley National Park has a Hot Desert Climate (BWh). The plant hardiness zone at Badwater Basin is 9b with an average annual extreme minimum temperature of 27.3 °F (-2.6 °C).

Death Valley is the hottest and driest place in North America due to its lack of surface water and low relief. It is so frequently the hottest spot in the United States that many tabulations of the highest daily temperatures in the country omit Death Valley as a matter of course.

On the afternoon of July 10, 1913, the United States Weather Bureau recorded a high temperature of 134 °F (56.7 °C) at Greenland Ranch (now Furnace Creek) in Death Valley. This temperature stands as the highest ambient air temperature ever recorded at the surface of the Earth. (A report of a temperature of 58 °C (136.4 °F) recorded in Libya in 1922 was later determined to be inaccurate.) Daily summer temperatures of 120 °F (49 °C) or greater are common, as well as below freezing nightly temperatures in the winter. July is the hottest month, with an average high of 115 °F (46 °C) and an average low of 88 °F (31 °C). December is the coldest month, with an average high of 65 °F (18 °C) and an average low of 39 °F (4 °C).[18] The record low is 15 °F (-9.4 °C).

Several of the larger Death Valley springs derive their water from a regional aquifer, which extends as far east as southern Nevada and Utah. Much of the water in this aquifer has been there for many thousands of years, since the Pleistocene ice ages, when the climate was cooler and wetter. Today's drier climate does not provide enough precipitation to recharge the aquifer at the rate at which water is being withdrawn.

The highest range within the park is the Panamint Range with Telescope Peak being its highest point at 11,049 feet (3,368 m). The Death Valley region is a transitional zone in the northernmost part of the Mojave Desert and consists of five mountain ranges removed from the Pacific Ocean. Three of these are significant barriers: the Sierra Nevada, the Argus Range, and the Panamint Range. Air masses tend to lose moisture as they are forced up over mountain ranges, in what climatologists call a rainshadow effect.



Figure 33: Telescope Peak

The exaggerated rainshadow effect for the Death Valley area makes it North America's driest spot, receiving about 1.5 inches (38 mm) of rainfall annually at Badwater (some years fail to register any measurable rainfall). Annual average precipitation varies from 1.92 inches (49 mm) overall below sea level to over 15 inches (380 mm) in the higher mountains that surround the valley. When rain does arrive it often does so in intense storms that cause flash floods which remodel the landscape and sometimes create very shallow ephemeral lakes.

The hot, dry climate makes it difficult for soil to form. Mass wasting, the down-slope movement of loose rock, is therefore the dominant erosive force in mountainous area, resulting in "skeletonized" ranges (mountains with very little soil on them). Sand dunes in the park, while famous, are not nearly as widespread as their fame or the dryness of the area may suggest. The Mesquite Flat dune field is the most easily accessible from the paved road just east of Stovepipe Wells in the north-central part of the valley and is primarily made of quartz sand. Another dune field is just 10 miles (16 km) to the north but is instead

mostly composed of travertine sand. The highest dunes in the park, and some of the highest in North America, are located in the Eureka Valley about 50 miles (80 km) to the north of Stovepipe Wells, while the Panamint Valley dunes and the Saline Valley dunes are located west and northwest of the town, respectively. The Ibex dune field is near the seldom-visited Ibex Hill in the southernmost part of the park, just south of the Saratoga Springs marshland. All of the latter four dune fields are accessible only via unpaved roads. Prevailing winds in the winter come from the north, and prevailing winds in the summer come from the south. Thus the overall position of the dune fields remains more or less fixed.

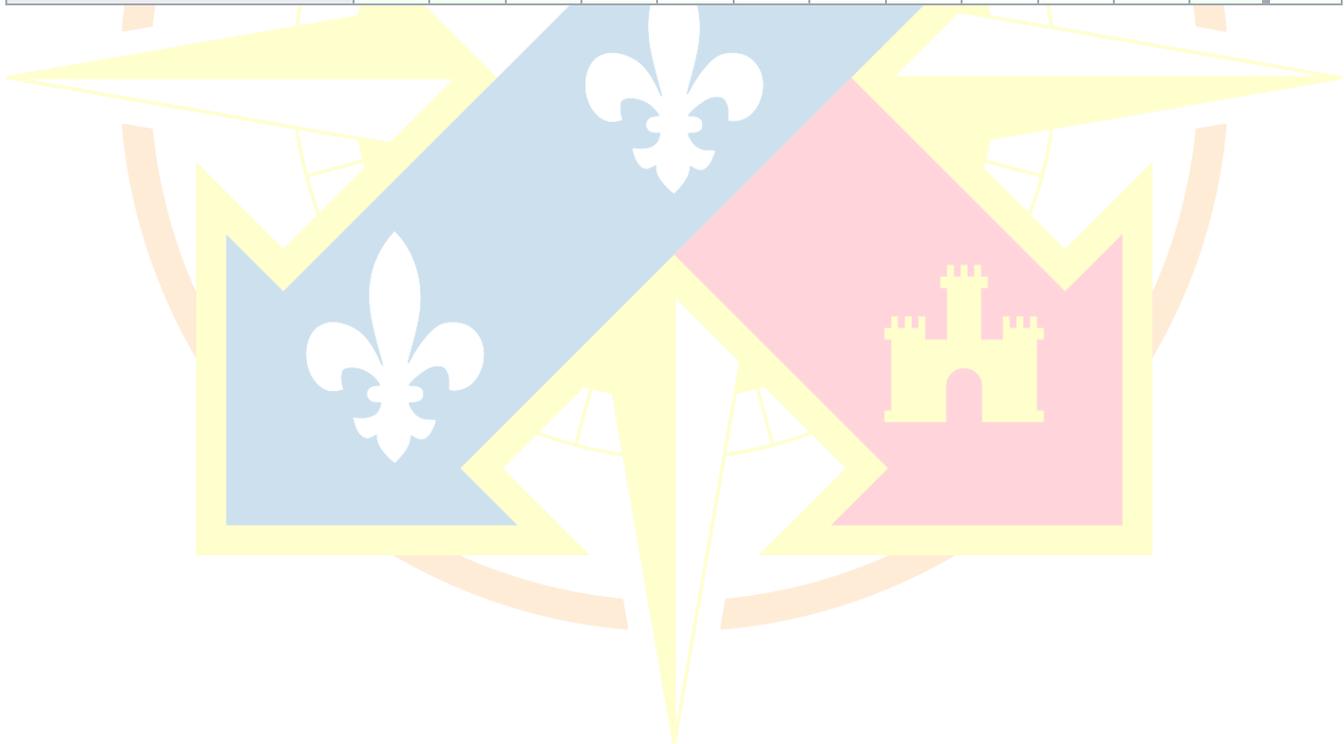
There are rare exceptions to the dry nature of the area. In 2005, an unusually wet winter created a 'lake' in the Badwater Basin and led to the greatest wildflower season in the park's history. In October 2015, a "1000 year flood event" with over three inches of rain caused major damage in Death Valley National Park.

Elevation is Everything

Air temperature changes by five degrees for every 1,000 feet of elevation you gain or lose; temperatures Telescope Peak can be 20+ degrees cooler than temperatures along the valley floor. Be prepared for this kind of variation during your trip.

Climate data for Death Valley (Furnace Creek Station)													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	88 (31)	97 (36)	102 (39)	113 (45)	122 (50)	128 (53)	134 (57)	130 (54)	123 (51)	113 (45)	98 (37)	88 (31)	134 (57)
Average high °F (°C)	66.9 (19.4)	73.3 (22.9)	82.1 (27.8)	90.5 (32.5)	100.5 (38.1)	109.9 (43.3)	116.5 (46.9)	114.7 (45.9)	106.5 (41.4)	92.8 (33.8)	77.1 (25.1)	65.2 (18.4)	91.4 (33.0)
Average low °F (°C)	40.0 (4.4)	46.3 (7.9)	54.8 (12.7)	62.1 (16.7)	72.7 (22.6)	81.2 (27.3)	88.0 (31.1)	85.7 (29.8)	75.6 (24.2)	61.5 (16.4)	48.1 (8.9)	38.3 (3.5)	62.9 (17.2)
Record low °F (°C)	15 (-9)	26 (-3)	26 (-3)	39 (4)	46 (8)	54 (12)	67 (19)	65 (18)	55 (13)	37 (3)	30 (-1)	22 (-6)	15 (-9)
Average precipitation inches (mm)	0.39 (9.9)	0.51 (13)	0.30 (7.6)	0.12 (3.0)	0.03 (0.76)	0.05 (1.3)	0.07 (1.8)	0.13 (3.3)	0.21 (5.3)	0.07 (1.8)	0.18 (4.6)	0.30 (7.6)	2.36 (60)
Mean monthly sunshine hours	217	226	279	330	372	390	403	372	330	310	210	186	3,625

Climate data for Death Valley (Cow Creek Station)													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	84 (29)	89 (32)	100 (38)	110 (43)	120 (49)	125 (52)	126 (52)	125 (52)	123 (51)	111 (44)	95 (35)	84 (29)	126 (52)
Average high °F (°C)	64.4 (18.0)	71.6 (22.0)	80.6 (27.0)	90.9 (32.7)	100.0 (37.8)	109.3 (42.9)	116.0 (46.7)	113.8 (45.4)	106.9 (41.6)	92.1 (33.4)	75.4 (24.1)	65.9 (18.8)	90.6 (32.6)
Daily mean °F (°C)	52.5 (11.4)	59.1 (15.1)	67.4 (19.7)	77.5 (25.3)	86.4 (30.2)	95.3 (35.2)	102.1 (38.9)	99.9 (37.7)	92.1 (33.4)	78.1 (25.6)	62.3 (16.8)	54.1 (12.3)	77.2 (25.1)
Average low °F (°C)	40.6 (4.8)	46.6 (8.1)	54.3 (12.4)	64.1 (17.8)	72.7 (22.6)	81.2 (27.3)	88.4 (31.3)	86.0 (30.0)	77.4 (25.2)	64.0 (17.8)	49.3 (9.6)	42.4 (5.8)	63.9 (17.7)
Record low °F (°C)	19 (-7)	30 (-1)	33 (1)	45 (7)	52 (11)	54 (12)	69 (21)	69 (21)	57 (14)	40 (4)	32 (0)	27 (-3)	19 (-7)
Average precipitation inches (mm)	0.24 (6.1)	0.32 (8.1)	0.20 (5.1)	0.20 (5.1)	0.10 (2.5)	0.02 (0.51)	0.10 (2.5)	0.11 (2.8)	0.12 (3.0)	0.11 (2.8)	0.20 (5.1)	0.29 (7.4)	2.00 (51)



Access & Fees

Park Fees

Vehicle Entrance Fee

- \$30 for 7 Days
- This permit allows all persons traveling with the permit holder in one single private, non-commercial vehicle (car/truck/van) to leave and re-enter the park as many times as they wish during the 7-day period from the date of purchase.

Motorcycle Entrance Fee

- \$25 for 7 Days

Individual Entrance Fee

- \$15 for 7 Days
- This permit allows a single individual traveling on foot or bicycle to leave and re-enter the park as many times as they wish during the 7-day period from the date of purchase.

Death Valley Annual Pass

- \$55 for one year
- Annual pass providing free entrance to Death Valley for 12 months from the date of purchase.

Payment Locations

Online payment of park entrance fees can be done at <http://recreation.gov>

In-person payment of the park entrance fee and purchase of annual or lifetime passes using either credit card or cash may be done at these locations during business hours:

- Furnace Creek Visitor Center

- Scotty's Castle Visitor Center (Closed until further notice)
- Stovepipe Wells Ranger Station
- Lone Pine Interagency Visitor Center
- Furnace Creek Campground kiosk (when staffed October 15 to April 15)

Payment of park entrance fees using credit card may be done at fee machines 24/7 at:

- Furnace Creek Visitor Center
- Stovepipe Wells Ranger Station
- Grapevine Ranger Station
- Ryan Kiosk (east entrance to park on Hwy 190)
- Zabriskie Point
- Badwater
- Hell's Gate (Daylight Pass Road)
- Furnace Creek Campground (April 16 to October 14)
- Sunset Campground (when open)
- Texas Springs Campground (when open)
- Stovepipe Wells Campground (when open)
- Mesquite Springs Campground

Backcountry Permits

Permits are highly recommended for all overnight Wilderness users. Filling out a permit provides us information in case of a search and rescue and provides you with a handy list of rules you must follow while camping in Death Valley

Submitting a permit with your trip itinerary WILL NOT initiate a search and rescue if you are overdue. Tell a friend or family member when you expect to return from the Wilderness/backcountry. They can contact Death Valley's Emergency Dispatch at (760) 786-2330 if you do not return from your trip. Prior to your trip, please review our [safety information section](#) in this guide.

Only one permit is needed per group.

How to fill out a permit:

1. Download and fill out this form. [DEVA-Wilderness-Permit-Form-10-404-508.pdf \(nps.gov\)](#)
2. Email the completed form to DEVA_BCpermits@nps.gov.
3. Print a copy of the completed form and keep it with you while at Death Valley NP or keep a saved digital copy with you on a smart device.
4. Permits can also be filled out in person at the Furnace Creek Visitor Center or Stovepipe Wells Ranger Station during business hours.

GROUP SIZE LIMITS

An organized group or individual party may not exceed a 12-person limit.

Mailing Address

P.O. Box 579
Death Valley, CA 92328

Park Information

Visitor Information
(760) 786-3200

Email

[Contact Us - Death Valley National Park \(U.S. National Park Service\) \(nps.gov\)](#)

Website

<https://nps.gov/deva>

Emergencies

Death Valley Dispatcher
(760) 786-2330

Contact Information

Trip Planning

Death Valley Wilderness

Death Valley National Park has the largest area of designated national park wilderness in the contiguous United States at 3,190,451 acres. That's 93% of the entire National Park! Despite that figure, nearly a thousand miles of paved and dirt roads intersect the wilderness, providing ready access to all but the most remote locations. In other words, most of the land between the roads in Death Valley National Park has been given an additional layer of protection from further development by being designated Wilderness.

Everyone is free to hike or ride horses throughout the wilderness. Although there are few trails and little water, the well-prepared traveler will find a lifetime's worth of exploring. Multi-day camping trips are possible, but even a short walk away from the road will immerse you in the solitude and silence that defines the wilderness experience of Death Valley.

The Wonders of Wilderness

Wilderness means many things to many people. For some, it involves a trip into the Park's undeveloped and remote backcountry. Others may see wilderness in a picnic near the Mesquite sand dunes. Yet, both would understand that it involves basic contact with nature.

Wilderness, as defined in the Wilderness Act of 1964, is land "protected and managed so as to preserve its natural conditions and which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable."

Americans became concerned with the rapid depletion of natural resources during the 19th century leading to government protection of early national parks such as Yosemite and Yellowstone. These parks, however, were primarily set aside for their scenic qualities. By the 1930s, however, the complexity and importance of entire ecosystems supporting plant and animal species were being studied. Parks such as Everglades in Florida were set aside to preserve wildlife habitat and natural processes which supported them. As technologies of the 1950s

made it easier for more people to access backcountry locations, the federal government, working with conservation groups, sought ways to expand protection of the nation's ever-decreasing wilderness lands. These efforts culminated in the passing of The Wilderness Act of 1964. The language of this bill makes plain the goals inherent in the law:

"IN ORDER TO ASSURE THAT AN INCREASING POPULATION, ACCOMPANIED BY EXPANDING SETTLEMENT AND GROWING MECHANIZATION, DOES NOT OCCUPY AND MODIFY ALL AREAS WITHIN THE UNITED STATES AND ITS POSSESSIONS, LEAVING NO LANDS DESIGNATED FOR PRESERVATION AND PROTECTION IN THEIR NATURAL CONDITION, IT IS HEREBY DECLARED TO BE THE POLICY OF THE CONGRESS TO SECURE FOR THE AMERICAN PEOPLE OF PRESENT AND FUTURE GENERATIONS THE BENEFITS OF AN ENDURING RESOURCE OF WILDERNESS."

Today, there are more than 109 million acres of federally protected Wilderness in 44 states. Yet, their area encompasses only 5.1 percent of the nation's land.

The benefits of Wilderness have been cited for centuries. William Shakespeare noted that "one touch of nature makes all the world kin." Nineteenth century American philosopher Henry David Thoreau intoned, "in wilderness is the preservation of the world.", while naturalist John Muir wrote, "brought into right relationships with the wilderness, man would see that his appropriation of Earth's resources beyond his personal needs would only bring imbalance and begat ultimate loss and poverty by all."

Wilderness has been associated with godliness, beauty, freedom, health and American virtues. Unhindered by humans, natural processes provide us all with clean air,

soil and water. Large expanses of undisturbed habitat are important to the survival of numerous plant and animal species and provide an ecological baseline with which to understand the impact of humans on nature. Wilderness areas provide beauty, solitude and inspiration as well as opportunities for solitude, hiking, camping, and wildlife viewing. Many important historic and cultural sites and artifacts are protected from disturbance in wilderness locations. Economic benefits are also inherent in wilderness as it enhances surrounding private land values.

Wading barefoot can be extremely dangerous. Be sure to unbuckle your pack when navigating any stream crossing.

- Take action to ensure that your group is self-reliant and aware of the risks involved with backpacking in the Wilderness.
- Be aware of the weather. 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 the area. 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

Death Valley is famous as the hottest place on earth and driest place in North America. The world record highest air temperature of 134°F (57°C) was recorded at Furnace Creek on July 10, 1913. Summer temperatures often top 120°F (49°C) in the shade with overnight lows dipping into the 90s°F (mid-30s°C.) Average rainfall is less than 2 inches (5 cm), a fraction of what most deserts receive. Occasional thunderstorms, especially in late summer, can cause flash floods.

In contrast to the extremes of summertime, winter and spring are very pleasant. Winter daytime temperatures

are mild in the low elevations, with cool nights that only occasionally reach freezing. Higher elevations are cooler than the low valley. Temperatures drop 3 to 5°F (2 to 3°C) with every thousand vertical feet (approx. 300m). Sunny skies are the norm in Death Valley, but winter storms and summer monsoons can bring cloud cover and rain. Wind is common in the desert, especially in the spring. Dust storms can suddenly blow up with approaching cold fronts.

The best time to hike in Death Valley is from November through March. Summer temperatures can be dangerous in the park's lower elevations. Even during spring and autumn the heat can be unbearable for most people. Save the low elevation hikes for the cooler winter days. The high peaks are a pleasant escape from the heat in summer but are usually covered with snow in the winter and spring. If you must climb them during winter season, be sure to be properly equipped with adequate winter clothing, an ice axe and crampons.

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 Crossing

Winter Related Activities

- Long Distance Hiking
- Overnight Camping
- Snow Shoeing
- Traversing Over Ice

Optional Activities

- Mountaineering

Route Planning

Death Valley National Park has few maintained trails and no established campsites in the wilderness. Since most hiking here is cross-country, it is important to hike on areas where your footsteps will have the least impact. Trampling of vegetation, fragile soil crusts, aquatic habitats and animal burrows should be avoided.

Death Valley offers excellent year-round hiking options, whether you're looking for a short day-hike or an overnight experience. When planning your trip, consider your interests, time, and ability. There is no perfect trail. Use the Wilderness Guide, other guidebooks, and topographic maps to plan the best trip for you during your visit. Refer to the map for campsite options.

Death Valley Wilderness Trail System

Harmony Borax Works

Length: 0.4 mi (0.6km) ADA accessible paved loop

Time: 30 minutes round trip

Difficulty: Easy

Elevation Gain: 50 ft (0.8km)

Location: 1 mile (1.6km) west of Furnace Creek on CA-190

Parking: Paved area with large spaces for RV's and buses

Closest Restroom: No restrooms. Furnace Creek Visitor Center 1 mile (1.6km) east.

Route: The paved loop takes you back in time as you learn the stories of **Death Valley borax and the 20-Mule Teams**. Interpretive panels along the way explain details of the borax processing, the story of the Mule Skinner, life in Harmony, and more.



Figure 34: Harmony is also a great place to see the night sky.

Salt Creek

Length: 0.5 mi (0.8km) ADA accessible wooden boardwalk loop

Time: 30 minutes round trip

Difficulty: Easy

Elevation Gain: Flat

Location: Salt Creek Road located 13 miles (20km) west of Furnace Creek on CA-190. The unpaved Salt Creek Road is typically passable to sedans.

Parking: The open gravel parking area is large enough for RV's and buses.

Closest Restroom: Vault toilets are located in the parking lot.

Route: The boardwalk is open year round, however the water flows down to the boardwalk only from November through May. The best time to visit is during the Spring (February - April) when the Salt Creek Pupfish are in spawn. Interpretive signs along the way explain pupfish behavior, their adaptations, and how they relate to other **pupfish** around the Mojave Desert.



Figure 35: Salt Creek - home to pupfish and some of Death Valley's best birding.

Natural Bridge

Length: 1 mi (3.2km) out and back round trip

Time: 45 minutes round trip

Difficulty: Easy

Elevation Gain: 86 ft (26m)

Location: The unpaved Natural Bridge Road is 13.5 miles (22km) south of CA-190 on Badwater Road and is typically passable to sedans.

Parking: Open parking area large enough for buses and RV's.

Closest Restroom: Vault toilet located in parking lot.

Route: The route from the information sign up the canyon to the bridge formation is easy to follow but very rocky. The canyon continues a short distance beyond the bridge where it abruptly ends at a dry waterfall.



Figure 36: Natural Bridge. Water is the force behind much of the beauty that we see in Death Valley today.

Badwater Salt Flat

Length: 1 mile (1.6km) out and back trip to edge of salt flat. 5 miles (8km) each way to the other side.

Time: Average hiking speed is 2 mph (3.2 km/h), make your own adventure!

Difficulty: Easy to difficult depending on length. It is flat. Do not attempt when it's hot!

Elevation Gain: Flat

Location: Badwater Road 30 minutes (17 miles/27km) south of Furnace Creek.

Parking: Paved parking lot with large spaces for RV's and buses.

Closest Restroom: Vault toilet located in parking lot.

Route: The **lowest point** in North America is a beautiful **salt flat** covering over 200 square miles (322km) of the valley. ADA accessible ramp leads down to boardwalk.



Figure 37: Badwater Basin -the lowest place in North America.

Mesquite Flat Sand Dunes

Length: 2 miles (3.2km) round trip out and back

Time: 1.5 hours round trip

Difficulty: Easy to Moderate

Elevation Gain: 185 ft (65m)

Location: Located in Stovepipe Wells Village 30 minutes (24mi/39km) west of Furnace Creek.

Parking: Paved lot with pull through spaces for buses and large RV's.

Closest Restroom: Vault toilets located in parking lot.

Route: The summit of the high dune is 1 mile (1.6km) each way. No formal trail. Of the seven sets of **dunes in Death Valley**, these are the most famous and accessible.



Figure 38: Mesquite Flat Sand Dunes

Ubehebe Crater Loop

Length: 1.5 mile (2.4km) loop

Time: 1 hour round trip

Difficulty: Moderate. Exposed edges! Not good for those with a fear of heights.

Elevation Gain: 500 ft (152m)

Location: 8 miles (13km) west of Scotty's Castle

Parking: The paved lot directly overlooks the crater and is large enough for buses and large RV's.

Closest Restroom: No restrooms. Nearest restrooms are located at the unstaffed Grapevine Ranger Station 5 miles (8km) east of the crater.

Route: The hike is commonly done in a counter-clockwise direction where hikers begin with the uphill section first. Within 0.5 mi (0.8km) Little Hebe Crater comes into view and is a common destination for those looking for a shorter trip.



Figure 39: Ubehebe Crater Loop. Use caution near the edge!

Darwin Falls

Length: 2 miles (3.2km) out and back round trip

Time: 1.5 - 2 hours round trip

Difficulty: Moderate

Elevation Gain: 450 ft (137m)

Location: The unpaved Darwin Falls Road is located 1.2 miles (2km) west of Panamint Springs on CA-190. To the trailhead (first 2.5 mi/4km), Darwin Falls Road from CA-190 is typically passable to a sedan, however it is much more comfortable in a high clearance vehicle. Travelling from the town of Darwin to the trailhead is recommended for 4x4 high clearance vehicles only. Steep grades and unmarked intersections. Traveling to Darwin from the falls is not recommended.

Parking: Small gravel parking area. Not recommended for large RV's.

Closest Restrooms: No restrooms. The nearest facilities are located at the privately owned Panamint Springs Resort.

Route: Unmarked. From the bulletin board head past the gate and into the wash up the canyon. The unmarked

route is fairly flat but rocky as it transitions from a desert wash into a high walled canyon. Inside the canyon thick vegetation, stream crossings, and large slick rocks require that hikers use caution as they work their way deeper into the oasis. Please protect this fragile resource. No swimming!



Figure 40: Darwin Falls is a rare and special place in the Mojave Desert. Please protect it. No swimming!

Golden Canyon, Gower Gulch, and Badlands Loop

Length: 3 to 8 miles (5 to 13km) routes.

Time: 1.5 to 4.5 hours round trip depending on route.

Difficulty: Moderate to Strenuous.

Elevation Gain: 535 ft to 834ft (163m to 254m).

Two Locations:

Golden Canyon trailhead located 2 miles south of CA-190 on Badwater Road.

Zabriskie Point on CA-190 located 3.5 miles east of Badwater Road.

Parking: Paved lots at both locations. Large spaces for RV's and buses.

Closest Restroom: Located in both parking lots.

Route: A maze of canyons and badlands create hiking opportunities galore. Go to the [Golden Canyon page](#) for route details, map, and GPS data.



Figure 41: Golden Canyon

Desolation Canyon

Length: 3.6 mile (5.8km) out and back round trip

Time: 2.5 hours round trip

Difficulty: Moderate to Difficult

Elevation Gain: 600 ft (183m)

Location: The short unpaved Desolation Canyon Road is located 3.7 miles (6km) south of CA-190 on Badwater Road. Typically passable to sedans.

Parking: Open gravel parking area large enough for buses and RV's.

Closest Restroom: No restroom at site. Golden Canyon parking lot 1.7 miles (2.7km) north has a vault toilet in the parking lot.

Route: Unmarked route with rock scrambling required.



Figure 42: Desolation Canyon

Mosaic Canyon

Length: 4 miles (6.4km) out and back round trip

Time: 2.5 - 3 hours round trip

Difficulty: Moderate to Difficult

Elevation Gain: 1,200 ft (366m)

Location: The 2.3 mile (3.7km) unpaved Mosaic Canyon Road is located in Stovepipe Wells Village just across from Stovepipe Wells Campground. The road is typically passable in a sedan.

Parking: A large gravel parking area. Buses and large RV's not recommended.

Closest Restroom: Stovepipe Wells Village at the general store and restaurant.

Route: Many hikers choose to hike to the first set of beautiful canyon narrows less than 0.5 miles (0.8km) into the canyon.



Figure 43: Polished marble walls of Mosaic Canyon

Willow Canyon

Length: 4.2 miles (6.8km) out and back, round trip

Time: 2.5 hours, round trip

Difficulty: Moderate to Difficult

Elevation Gain: 776 ft (237m)

Location: An unmarked gravel access road is located on Badwater Road 31.5 miles south of CA-190 between mile markers 31 & 32. The access road is less than 0.5 miles (0.8km) long and is typically passable to a sedan. Same as Sidewinder Canyon.

Parking: Open gravel area large enough for buses and RV's.

Closest Restroom: No restrooms nearby. Follow **principle 3 of Leave No Trace (LNT)**.

Route: This route isn't very physically demanding, but finding the canyon and seasonal waterfall is a reward that only cross country navigators get to enjoy. No road and no hiking route signage. From the parking area avoid the small foothills and canyons to the east. Instead make your way north/northeast wrapping around the foothills and head toward the deep canyon in the mountains. Most of this route is across the rocky alluvial fan and exposed to the sun. The last 0.25 miles (0.4km) into the narrow canyon is over polished bedrock before ending at the waterfall.



Figure 44: Seasonal Waterfall at Willow Canyon

Sidewinder Canyon

Length: 5 miles (8.4km) out and back round trip

Time: 6 hours round trip

Difficulty: Extremely Difficult

Elevation Gain: 1,580 ft (482m)

Location: An unmarked gravel access road is located on Badwater Road 31.5 miles south of CA-190 between mile markers 31 & 32. The access road is less than 0.5 miles (0.8km) long and is typically passable to a sedan.

Parking: Open gravel area large enough for buses and RV's. Same location as Willow Canyon.

Closest Restroom: No restrooms nearby. Follow **principle 3 of Leave No Trace (LNT)**.



Figure 45: Sidewinder Canyon - mouth of slot #2

Fall Canyon

Length: 6 miles (9.7km) out and back, round trip

Time: 3.5 hours round trip

Difficulty: Moderate to Difficult

Elevation Gain: 2,460 ft (752m)

Location: The 2.7 mile (4.3km) unpaved two-way section of Titus Canyon Road is located 11.9 miles north of CA-190 on Scotty's Castle Road. The road is typically passable to sedans.

Parking: Open gravel parking area not recommended for large RV's or buses.

Closest Restroom: Vault toilet in the parking lot.



Figure 46: Hiking up Fall Canyon

Panamint Dunes

Length: 8 miles (12.8km) out and back

Time: 4-5 hours round trip

Difficulty: Moderately difficult

Elevation Gain: 1,028 ft (313m)

Location: Unmarked cross-country route off the unpaved Lake Hill road, approximately 4.5 miles east of Panamint Springs on the north side of CA-190. Access to the trailhead requires a high clearance vehicle.

Parking: Small gravel lot.

Closest Restroom: Panamint Springs Resort or Emigrant Canyon Rest Station. No restroom along the trail, follow **principle 3 of Leave No Trace (LNT)**.

GPS Data: 36° 27.673'N, -117° 27.331'W (the highest dune)

Route: From the prominent bend on Lake Hill Road approximately 5.5 miles (8.9km) from CA-190 take a direct route toward the dunes to the north. The unmarked route is uneven, sandy, and partially rocky. The elevation gain is gradual until you reach the dunes at approximate 3 miles in. From there, sandy and strenuous to the tops of 4 different dunes.



Figure 47: Panamint Dunes

Little Bridge Canyon

Length: 7 mile (11.2km) out and back, round trip.

Time: 5 hours round trip.

Difficulty: Difficult

Elevation Gain: 1,900 ft (590m)

Location: CA-190 at milemarker 89 eastbound.

Parking: No official parking lot or signage. Park on the shoulder of the eastbound lane of CA-190 at milemarker 89. There is enough space for multiple vehicles, however large RV's are not recommended. Use caution along this

high speed highway.

Closest Restroom: One mile (1.6km) east, vault toilets are located in Mesquite Dunes parking lot.

GPS Data: GPS data for the unmarked route is for supplemental purposes only. Take a map and compass when exploring the trail-less wilderness.



Figure 48: Little Bridge

Wildrose Peak

Length: 8.4 miles (13.5km) out and back, round trip.

Time: 6 hours round trip.

Difficulty: Difficult

Elevation Gain: 2,200 ft (671m)

Location: From CA-190 follow Emigrant Canyon Road past the Wildrose Campground to the parking area at the Charcoal Kilns. The final 2 miles is a maintained gravel surface typically passable in a sedan. 25 ft vehicle limit.

Parking: 25 ft vehicle limit. Open gravel area.

Closest Restroom: Vault toilet in parking area. No restroom along the trail, follow **principle 3 of Leave No Trace (LNT)**.

Route: A great hike for when it starts getting too hot in the valley. Winter storms may bring some snow.



Figure 49: The view from Wildrose Peak toward Badwater.

Telescope Peak

Length: 14 mile (22.5km) out and back, round trip

Time: 7 hours round trip

Difficulty: Difficult

Elevation Gain: 3,000 ft (914m)

Location: From CA-190 follow Emigrant Canyon Road past the Wildrose Campground to the parking area at the Charcoal Kilns. The final 5 miles is a maintained gravel surface typically passable in a sedan. 25 ft vehicle limit.

Parking: 25 ft vehicle limit. Open gravel area.

Closest Restroom: Vault toilet in parking area. No restroom along the trail, follow **principle 3 of Leave No Trace (LNT)**.

GPS Data: GPS data for the unmarked route is for supplemental purposes only. Take a map and compass when exploring the trail-less wilderness.



Figure 50: The summit of Telescope Peak

Dispersed Camping

Where is backcountry roadside camping allowed?

- Along dirt roads at least one mile away from any paved road or "day use only" dirt road.
- Camp only in previously disturbed areas and park your vehicle immediately adjacent to the roadway to minimize impact. The wilderness boundary is 50 feet from the center of most dirt roads.

Where is backcountry camping NOT allowed?

Camping is NOT allowed on the valley floor from Ashford Mill in the south to 2 miles north of Stovepipe Wells, on the Eureka Dunes or in Greenwater Canyon.

Backcountry campsites must be more than 100 yards from any water source to protect these fragile areas for wildlife use.

Camping is NOT allowed on the following Day Use Only dirt roads:

- Titus Canyon Road
- Mosaic Canyon Road
- West Side Road
- Wildrose Road
- Skidoo Road
- Aguerberry Point Road
- Cottonwood Canyon Road (first 8 miles only)
- Grotto Canyon Road
- Racetrack Road (from Teakettle Junction to Homestake Dry Camp)
- Natural Bridge Canyon
- Desolation Canyon
- Pinion Mesa Road
- Big Pine Road (22 miles inside of Death Valley National Park)

Camping is NOT allowed at the following historic mining areas:

- Keane Wonder Mine
- Lost Burro Mine
- Ubehebe Lead Mine

- Skidoo Mill
- One mile from all standing mining structures. Generally camping should be avoided in mining districts for personal and resource safety.

x = total distance traveled in miles

y = total elevation gain in feet

z = total time of rest per hour in minutes

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.

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

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:

$$\left(\frac{8 \text{ mi.}}{2 \frac{\text{mi.}}{\text{hr.}}} \right) + \left(\frac{2000 \text{ ft.}}{1000 \text{ ft.}} \right) + \left\{ \left(\frac{5 \text{ min.}}{60 \frac{\text{min.}}{\text{hr.}}} \right) \times \left[\left(\frac{8 \text{ mi.}}{2 \frac{\text{mi.}}{\text{hr.}}} \right) + \left(\frac{2000 \text{ ft.}}{1000 \text{ ft.}} \right) \right] \right\}$$

$$= 6.498 \text{ hrs.} \approx 6.5 \text{ hours}$$

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 Total Time

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.

Check for Updates

Check the park for current conditions of trails roads and any closures. Use this link for the latest information:

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

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

Weather

[National Weather Service - NWS Las Vegas \(noaa.gov\)](https://www.noaa.gov/)

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

You need to stay well hydrated so you consume enough water, one gallon per person per day. Do not drink untreated water. Information on the flow of natural springs, based on the best available data, can be found by contacting the ranger's office. Plan ahead and prepare, your safety is your responsibility.

Water in the Mountains

The mountains offer an abundance of creeks and streams to resupply your water. You just need to be sure to treat your water properly.

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 ¼ 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 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 Wilderness.

Travel Logistics

Automobiles

The main road transecting Death Valley National Park from east to west is California Highway 190.

On the east in Nevada, U.S. Route 95 parallels the park from north to south with connecting highways at Scotty's Junction (State Route 267- Access closed until further notice), Beatty (State Route 374), and Lathrop Wells (State Route 373).

The most direct route from Las Vegas is via Pahrump, NV, and California Highway 190.

Coming from the west, State Route 14 and U.S. Route 395 lead to Ridgecrest, CA where State Route 178 heads east into the park. Further north on Hwy 395 at Olancho, CA

you can join Hwy 190 to the park, or north of that at Lone Pine, CA, Hwy 136 will also join Hwy 190 heading east into the park.

South of the park, Interstate 15 passes through Baker, California on its way from Los Angeles to Las Vegas. State Route 127 travels north from Baker to Shoshone and Death Valley Junction with connections to the park on State Route 178 from Shoshone and connection with California Highway 190 at Death Valley Junction.

Public Transportation

There is no public transportation in Death Valley.

GPS Navigation

GPS Navigation to sites to remote locations like Death Valley are notoriously unreliable. Numerous travelers have been directed to the wrong location or even dead-end or closed roads. Travelers should always carry up-to-date road maps to check the accuracy of GPS directions.

DO NOT DEPEND ONLY ON YOUR VEHICLE GPS NAVIGATION SYSTEM.

There is no specific street address for the park or the Furnace Creek Visitor Center. Many GPS users have had success using the street address for the Death Valley Post Office which is located about 400 meters south of the visitor center.

The post office address is:

**328 Greenland Blvd.
Death Valley, CA 92328**

Map coordinates for the visitor center are:

**N 36°27.70
W 116°52.00**

Cell Phone Coverage

Cell phones do not work in Death Valley! Do not depend on them. In some cases there is spotty reception, but dependence on a cell phone in an emergency situation can be fatal.

Backcountry Travel

Travel on the park's hundreds of miles of backcountry roads requires the correct type of vehicle for the road

conditions, a vehicle in good repair with all necessary tools and replacement parts, and some knowledge of driving on rough dirt, gravel and 4-wheel drive roads. Backcountry travel in the summer months, April through the middle of October, can be dangerous and also requires plenty of water and supplies stored in the vehicle and knowledge of how to survive a failed vehicle in desert summer conditions!

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 pocket knife
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
- **Stream Crossings**

- Water Shoes

Winter Related Activities

- **Long Distance Hiking**
 - Hiking Shoes
 - Trekking Poles
 - Navigation
- **Overnight Camping**
 - Pack
 - Shelter
 - Sleep System
- **Snow Shoeing**
 - Snowshoes
- **Traversing Over Ice**
 - Traction

Optional Activities

- **Mountaineering**
 - Rope
 - Helmet
 - Harness
 - Runners
 - Carabiners

Website

none

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 time we spend in the backcountry will be during the Cottonwood Canyon to Marble Canyon Loop which requires 3 days and 2 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	2	2	3

Outfitter Services

There are not a lot of resources in the Death Valley area. Your best plan is to bring everything you will need. It is advisable to swing by a local outfitter store such as REI to get any last-minute items you may need in a major metro area you are traveling through such as Las Vegas or Bakersfield depending on where you are traveling from.

High Sierra Outfitters

Services

Equipment Sales

Phone

(760) 876-9994

Address

130 S Main St, Lone Pine, CA 93545

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.

Special skills that may be needed for Big Bend are:

- Mountaineering
- Rock Climbing

Regulations and Safety

Backcountry Regulations

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

Backpacking in Death Valley National can be challenging, but the opportunities for experiencing solitude, sweeping vistas, dark night skies and awesome geology abound within the three million acres of designated Wilderness. There are few established trails in the park, but hikers can follow canyon bottoms, open desert washes, alluvial fans and abandoned dirt roads to get around.

1. **Permit Required** - Backpackers are requested to obtain a free backcountry permit online or in person at the Furnace Creek Visitor Center or the Stovepipe Wells Ranger Station.
2. **Leave No Trace** – LNT guidelines should be followed to minimize impacts on the fragile desert environment.
3. **Group Size Limit** - Overnight group size is limited to 12 people and no more than 4 vehicles. Larger groups will need to split up and camp at least 1/2 mile apart.
4. **No Campfires** - Campfires are not allowed in the backcountry. Use a campstove instead.
5. **No Pets** - Pets are not allowed on trails or in the wilderness. However, pets are allowed on the Furnace Creek bike path and hundreds of miles of backcountry dirt roads.
6. **Bring Water** - Water at springs can be dry or contaminated. These fragile, sensitive habitats are also vital to wildlife. Plan to carry your own water or stash it ahead of time. During hot spring, summer and fall months, one gallon of water or more per person per day is needed.
7. **Do Not Touch Wildlife** - Feeding, touching, teasing, or intentionally disturbing wildlife is prohibited. 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.

8. **Don't Kick Rocks** - Throwing or rolling rocks or other items down hillsides or mountainsides, into valleys or canyons, or inside caves is prohibited.
9. **Leave it Alone** - Possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state any plants, rocks, animals, mineral, cultural or archeological resources natural features, or signs is prohibited. Walking on, entering, traversing, or climbing an archeological resource is prohibited.
10. **Pack out all litter.** Help preserve the park's natural beauty by packing out all litter, including cigarette butts and toilet paper.
11. **Do not cut switchbacks on trails.** Although cross-country hiking is allowed, help prevent trail erosion by staying on marked trails.
12. **Contaminating natural water sources and their surroundings is prohibited. Camp at least 100 yards (91 m) from any water source.** Desert water sources and springs are fragile and vital for the plants and animals that depend on them for survival. Soaps, oils, skin lotions, and food residues from bathing and washing can seriously impact water quality. Minimize your impact to areas surrounding springs, seeps, and other temporal water sources.
13. **Camping Along Roads** - Along dirt roads at least one mile away from any paved road or "day use only" dirt road. Camp only in previously disturbed areas and park your vehicle immediately adjacent to the roadway to minimize impact. The wilderness boundary is 50 feet from the center of most dirt roads.

14. **Learn about the region before you go** – Talk to a ranger or read publications before your trip. When you familiarize yourself with a certain area, you will know what equipment you need for a safe trip and to leave the area as pristine as you found it.
15. **Walk on durable surfaces** – Since most hiking in Death Valley National Park is cross-country, it's important to hike on areas where your footsteps will have the least impact. Trampling of vegetation, fragile soil crusts, and animal burrows should be avoided. Walking in canyons with flowing water can have damaging effects on riparian habitats. Avoid walking in the water if possible. If there is an established trail, stay on it. Other low impact areas include desert pavement and dry, gravelly washes. When hiking in large groups cross-country, disperse into smaller groups of 3 or 4 and do not walk single file as this creates trails that can last for years.
16. **Choose resistant campsites** – Avoid areas with organic ground cover. Instead, choose areas on rock, sand or gravel. Cooking areas should be located away from sleeping areas. This "spreading out" will reduce impact in a concentrated area. Disperse large groups to reduce impacts.
17. When camping in a designated site prevent resource damage by camping within the area outlined by rocks, logs, or brush.
18. **Do not feed wildlife.** Feeding wildlife is illegal; it often results in having to destroy the animal. Keep food in a hard-sided vehicle or food storage locker where provided.
19. **You must have a plan for human waste.** Human waste bags (WAG) bags are highly recommended and are available free of charge at the Conundrum Creek and Snowmass Lake trailheads. WAG bags must be packed out. Learn more about how to use a WAG bag. If a WAG bag is not used, visitors are required to deposit solid human waste in holes dug 6 to 8 inches deep at least 200 feet (70 paces) from water, camp and trails.
20. **Off-Road Driving is prohibited** – The desert environment is extremely fragile and slow to recover from vehicle damage. If pulling off a road to camp, choose a place that has already been disturbed.
21. As with all designated Wilderness, motorized and mechanized equipment is prohibited including bicycles, motorbikes, chainsaws, ATVs, carts, drones, hang gliders and paragliders. This equipment is prohibited to provide visitors with a primitive recreational experience and to preserve outstanding opportunities for solitude.

Overnight Camping (Etiquette)

"At-large" camping is allowed in some areas of the park. 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.

Leave No Trace Principles



Developed by the National Outdoor Leadership School, the principles of Leave No Trace are an extension of the National Park Service mission to preserve a vast system of resources

“unimpaired for the enjoyment of future generations” that challenge individuals to become active stewards in its preservation. The Program builds awareness, appreciation, and respect for the land, and provides a foundation for applying minimum-impact techniques.

Plan Ahead and Prepare

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

Travel and Camp on Durable Surfaces

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

Dispose of Waste Properly

- Pack it in, pack it out. Inspect your campsite and rest areas for trash or spilled foods. Never bury it or dump it in pit toilets. Pack out all trash, leftover food, and litter.
- To wash yourself or your dishes, carry water 100 feet away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.
- Deposit solid human waste in catholes dug 6 to 8 inches deep at least 100 feet from water, camp, and trails. Cover and disguise the cathole when finished.
- Pack out toilet paper and hygiene products.

Respect Wildlife

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

Minimize Campfire Impacts

- Campfires can cause lasting impacts to the backcountry. Use a lightweight stove for cooking and enjoy a candle lantern for light.
- Where fires are permitted, use established fire rings, fire pans, or mound fires. Campfires are only permitted in specified campsites in designated fire rings.
- Keep fires small. Burn only small diameter dead and down wood. Do not break, cut or saw branches from any standing tree (dead or alive).

- Burn all wood and coals to ash, put out campfires completely. Fires must be completely extinguished before you leave the site.

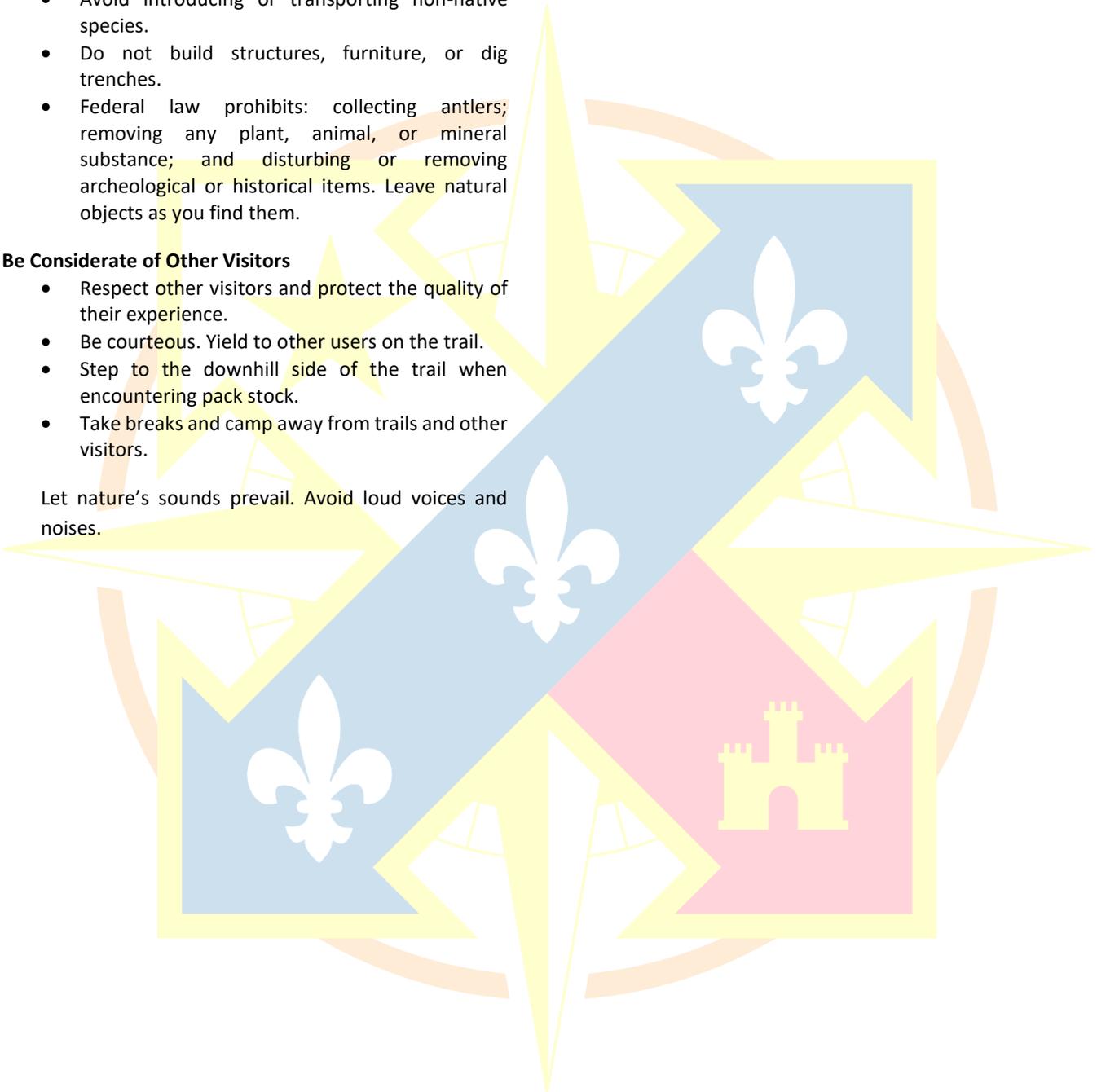
Leave What You Find

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

Be Considerate of Other Visitors

- Respect other visitors and protect the quality of their experience.
- Be courteous. Yield to other users on the trail.
- Step to the downhill side of the trail when encountering pack stock.
- Take breaks and camp away from trails and other visitors.

Let nature's sounds prevail. Avoid loud voices and noises.



Backcountry Safety

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.

Never place your hands or feet where you cannot see first. Rattlesnakes, scorpions, or black widow spiders may be sheltered there.

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.

Invasive Burros

Burros, also known as donkeys, are not native, but are remnant populations brought here by early prospectors. Despite the sparse vegetation, burro populations have exploded here, especially around springs in Saline Valley, Butte Valley, and Wildrose. Invasive burros have had a large impact on fragile desert springs and ecosystems. They aggressively defend their territory and keep native

species like Desert Bighorn and other wildlife away from water sources.

Park management is working to control burro populations with a nonprofit no-kill sanctuary where they receive medical care, training, and are adopted out.

Please do not feed burros or disturb trapping pens; drive slowly on the winding roads near Wildrose as they are frequently in the roadway. Stay in your car, as they can be aggressive.

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.

Mine Hazards

Do not enter mine shafts or tunnels; they might be unstable, have hidden pits, pockets of poisonous gases, or be home to wildlife. Stay Out—Stay Alive!

Illegal Marijuana Cultivation Sites

These sites have been found in remote backcountry areas of Death Valley National Park. Learn to recognize and avoid these potentially dangerous areas. If you find signs of cultivation:

- Get out immediately! Do not linger to take photos or coordinates.
- Go back the way you came. You've already established that the route is safe.
- Make as little noise as possible. If the garden is occupied, they may not be aware of you.
- Get to a safe location. Run, walk, crawl or hide... just make yourself safe.

- Notify FICC Dispatch at (760) 786-2330, (909) 383-5651, or (888) 233-6518.
- Be prepared to provide your exact location. Coordinates are great but a physical description will do.
- Get to your vehicle if possible. If you can, drive away.

Hantavirus

Hantavirus is a potentially fatal respiratory disease which is spread through contact with infected rodents or their urine and droppings. Although no cases have been reported in Death Valley, the virus has been found in deer mice and cactus mice here. Use caution in rodent infested locations such as cabins and mine structures.

Driving Safety

Vehicle accidents are the single largest cause of serious injury or death in the park! Sharp turns lead to rollover accidents. Enjoy the scenery when parked and follow speed limits.

Prepare for Breakdowns

In case of vehicle trouble, stay with your car. You'll have shade and be easier to find. If you're on a dirt road, plan on changing a flat tire at least once. Be aware that most rental cars do not have spare tires and agreements do not cover unpaved roads, resulting in expensive towing fees.

Water Safety

The desert is an extreme environment. Carry enough water, one gallon per person per day, and drink it. Water is available at visitor centers, campgrounds, and the Zion Lodge. Water flow at natural springs 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 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.

Fire Safety

Fire is a normal part of a healthy natural environment. During your stay in the backcountry there is a possibility of a wildland fire starting due to lightning or a human cause. Please be aware of this and take precautions. As you hike, note directions of possible escape routes if evacuation becomes necessary.

It is not uncommon to see clouds hanging over the mountains that may look like smoke. These clouds are called rain dogs and are often mistaken for smoke from a wildland fire.

In order to prevent an unnecessary evacuation, ask two questions:

- Do you smell smoke?
- Is there obvious movement/buildup of smoke from top to bottom?

In case of fire or smoke:

- Remain calm, do not panic.
- Do not investigate area of smoke.
- Watch for fixed-wing aircraft or helicopters. These aircraft may try to drop messages with further instructions.
- Checkout with park personnel to prevent an unnecessary search.

Safety Tips

Plan Ahead

Whether hiking solo or in a group, you need to become familiar with the area you will be hiking, the hazards, and the expected weather. The process of getting ready will include obtaining maps to review the area you will hike, briefing all members of the group on route selection, having a turnaround time, and developing alternate route selections. Let someone know where you are going, when, your departure point, your planned route and expected time of return.

Carry proper equipment, clothing and food

Test your equipment before leaving. Having a little extra clothing, especially for inclement weather, may weigh a bit more, but it is worth it when things go sour. The same rule of “a little extra can’t hurt” applies to food and drink. During the hotter summer months, extra water is especially important, even on shorter hikes and even in areas of high humidity. Dehydration comes on quickly and leads to other, more serious, problems. Better to lug around more than to be stranded with less than you need to survive.

Know your limits—and those of the other individuals in your group

A military unit travels at the speed of its slowest member, and that is a good way to think about how to hike. Constant communication is also key: If traveling in a group, you should use a buddy system. Checking your partner for energy levels, blisters, food consumption and fatigue can prevent problems down the trail.

Always bring along proper emergency equipment

When hiking by yourself, ensure that you have, at minimum, a first aid kit. Some recommended items include adhesive bandages, medical tape, over-the-counter pain relievers, moleskin, antibacterial ointment, a compress or two, and spare headlamp batteries. If traveling in a group, have a “community” first-aid kit with additional splints, pads and braces.

Learn in advance what to do if things go bad

Park rangers typically encourage hikers in genuine distress to “hug a tree,” which means staying where you are until help comes to you. You can last a long time with the gear you have with you. Whistles and mirrors are priceless. *Cellphones are not generally reliable.*

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 canyon.

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, careless 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 up canyon

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.

Reduced oxygen levels at high altitude causes physical distress



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

An ambitious backpacking trip located in the beautiful valleys and mountains of Death Valley National Park. Cottonwood-Marble Canyon Loop is a 31.8 mile lightly trafficked loop trail located near Death Valley, California that features beautiful wild flowers and is only recommended for very experienced adventurers. Famous among backpackers, this long loop is one of the most popular loops in the park. It's not difficult to see why this route is so well traveled, as it passes through dramatic canyons and desert landscapes, ascends steep ridgelines, and crosses through unlikely springs. Telescope Peak is the highest point in Death Valley. Though strenuous, this desert route is quite rewarding. Along the way, you'll have great viewpoints of the surrounding mountains and valleys. Once you reach the top, it won't be difficult to understand where the name "Telescope Peak" came from, as you'll be able to see for miles in all directions.

Itinerary

Death Valley Itinerary for March of 2021							
Date	Day/Activity	Night/Camp	Distance	Positive Gain	Negative Gain	Overall Gain	Travel Times
3/25/2021	Team will fly into Las Vegas where we will pick up our vehicle and load up our gear. We will make a supply run to REI and a local grocery store. We will then make our way to Death Valley where we will camp for the night at Stovepipe Wells.	Stovepipe Wells Campground					
3/26/2021	We will drive to the Cottonwood Canyon trailhead where we will then begin our hike of the Cottonwood/Marble canyon loop.	Cottonwood Springs	11.6 mi.	3763 ft.	1359 ft.	2404 ft.	10.36 hrs.
3/27/2021	Hike to our next campsite in Marble/Dead Horse Canyon	Marble/Dead Horse Canyon	6.63 mi.	1289 ft.	1754 ft.	-465 ft.	4.99 hrs.
3/28/2021	Hike back to the trailhead and finish the loop. Drive back to Stovepipe Wells. Continue on to Mahogany Flat campground.	Mahogany Flat Campground	7.45 mi.	768 ft.	2727 ft.	-1959 ft.	4.87 hrs.
3/29/2021	Hike to the summit of Telescope Peak and back. Drive back to Stovepipe Wells.	Stovepipe Wells Campground	15.3 mi.	4962 ft.	4962 ft.	0 ft.	13.66 hrs.
3/30/2021	Day Hikes: Mosaic, Sidewinder, Willow, or the Racetrack	Hotel in Stovepipe Wells	13.2 mi.	3556 ft.	3556 ft.	0 ft.	11.00 hrs.
3/31/2021	Drive to Las Vegas, Fly home						
Totals			54.18 mi.	14338 ft.	14358 ft.	-20 ft.	44.87 hrs.

Elevation Profile of Cottonwood to Marble Canyon Loop



Satellite Map of the Cottonwood to Marble Canyon Loop



Topographic Map of the Cottonwood to Marble Canyon Loop



Hiking Routes

Day 1

Trailhead: Cottonwood Canyon TH

Campsite: Cottonwood Spring

Mileage: 11.6 mi.

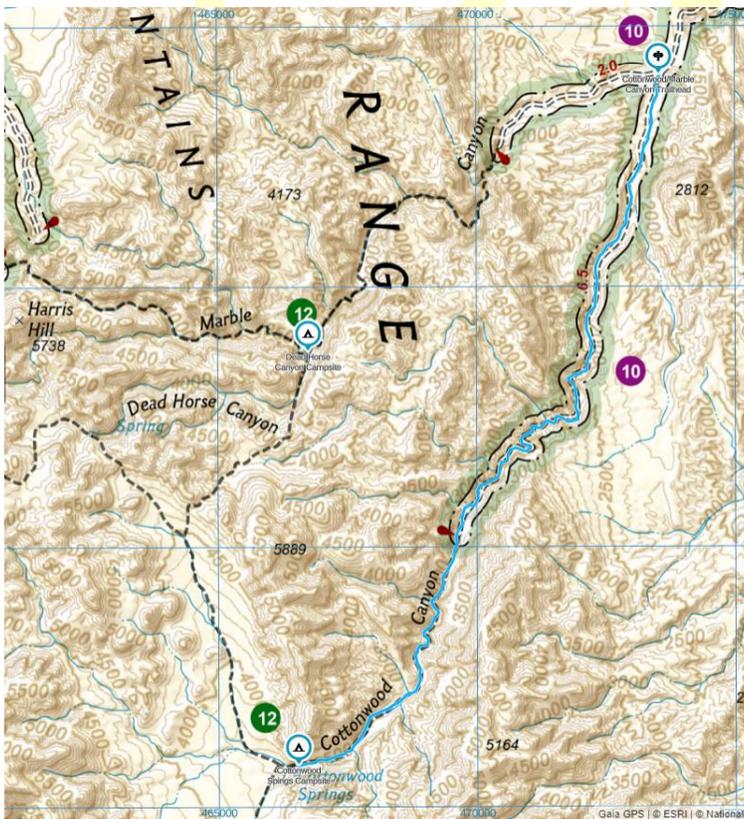
Water Locations: Cottonwood Spring

Emergency Access: Return to Cottonwood TH

Elevation Gain: 3763 ft.

Elevation Loss: 1359 ft.

Travel Time: 10.36 hrs.



Elevation



Day 2

Trailhead: Cottonwood Canyon

Campsite: Dead Horse Canyon

Mileage: 6.63 mi.

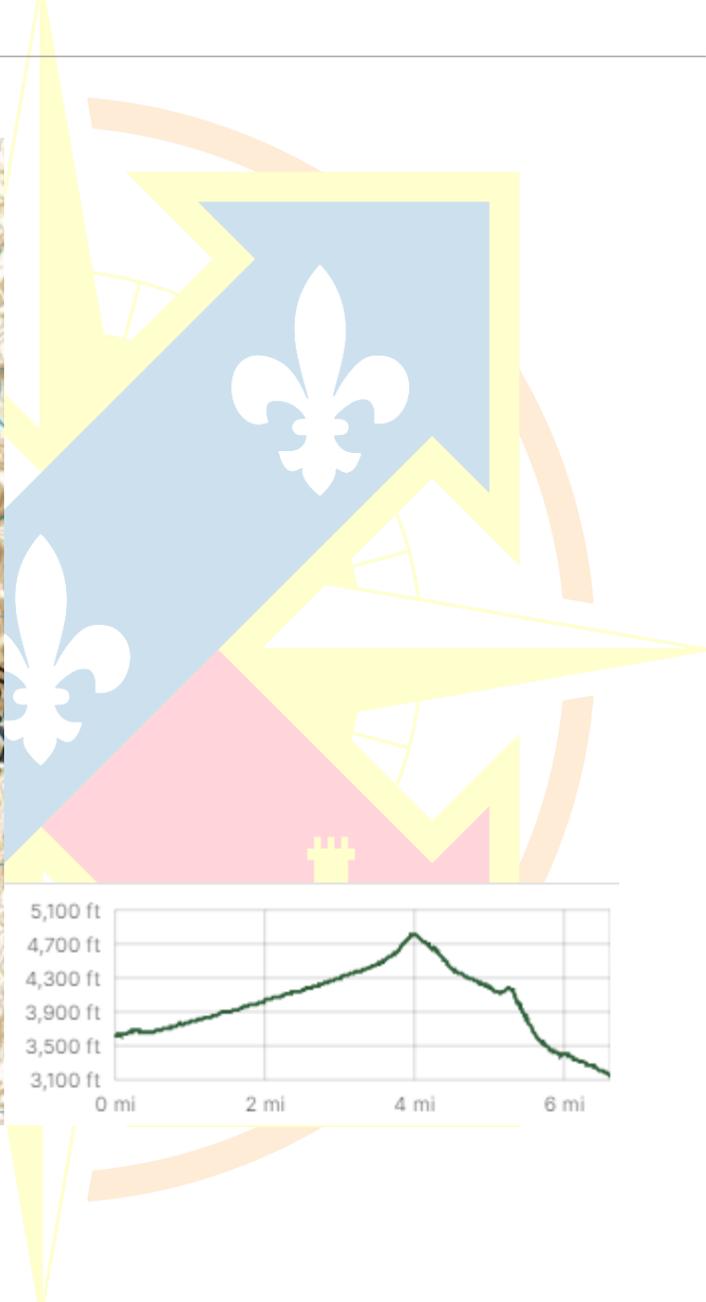
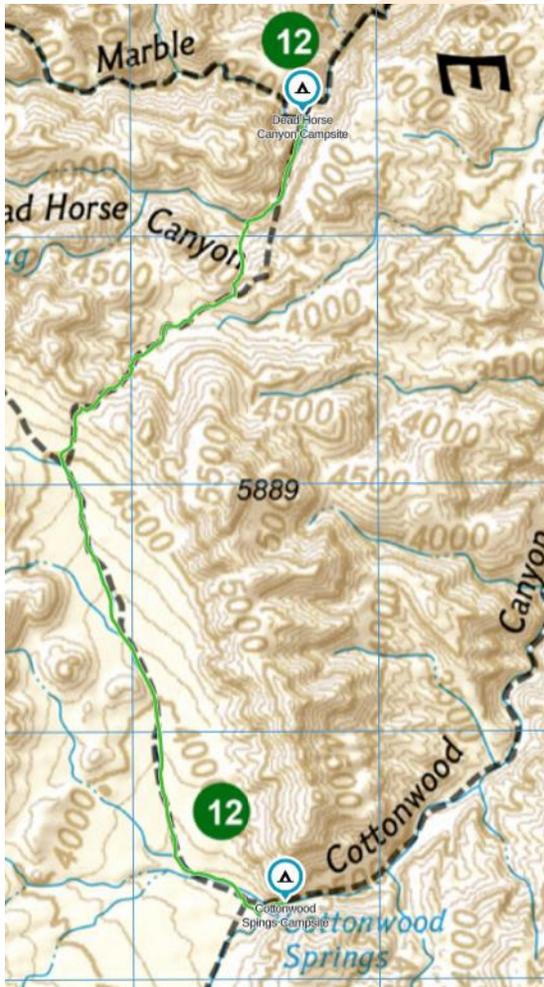
Elevation Gain: 1289 ft.

Elevation Loss: 1754 ft.

Travel Time: 5.0 hrs.

Water Locations: Varies along route. Can be unreliable. Pack in needed water.

Emergency Access: Cottonwood TH



Day 3

Trailhead: Marble Canyon

Elevation Gain: 768 ft.

Campsite: N/A

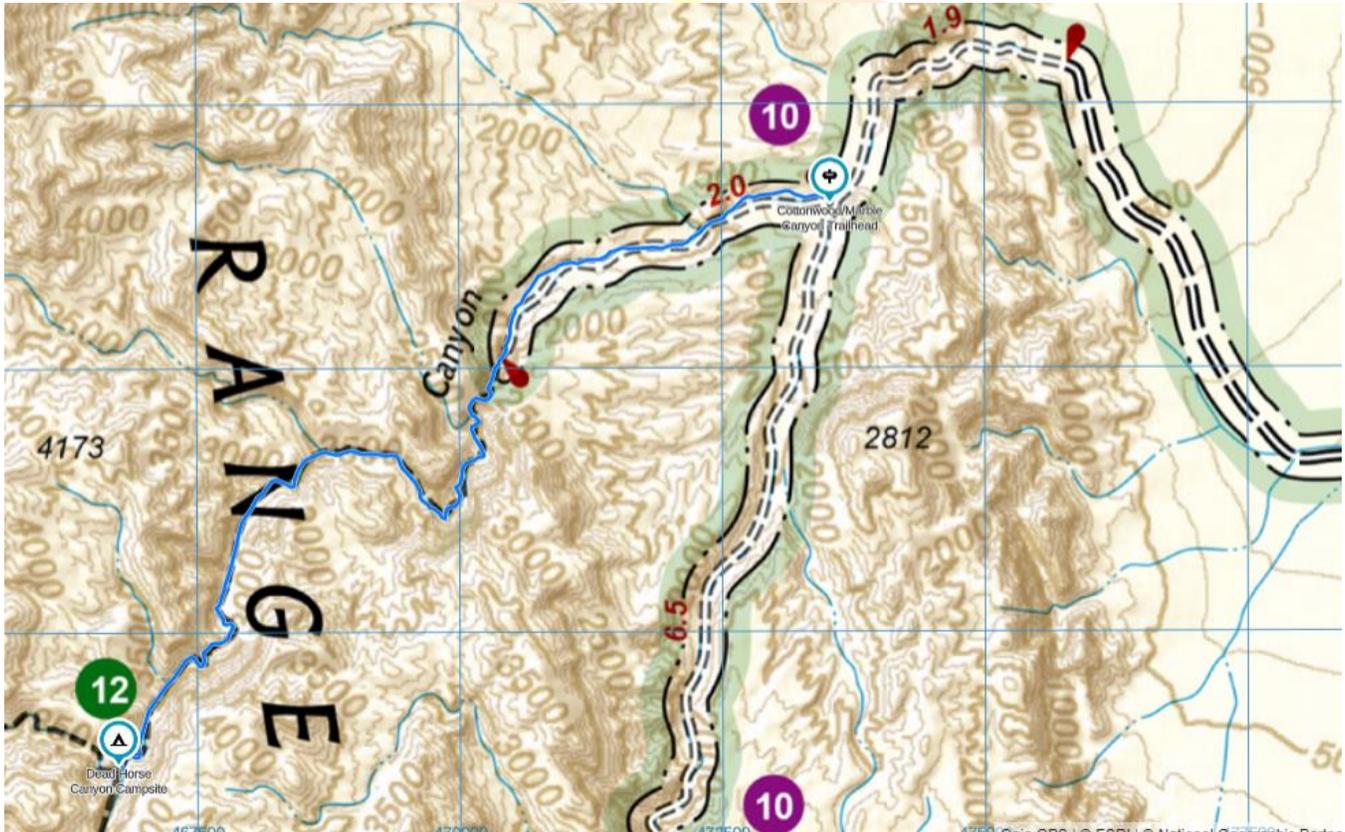
Elevation Loss: 2727 ft.

Mileage: 7.45 mi.

Travel Time: 7.87 hrs.

Water Locations: Varies along route. Can be unreliable. Pack in needed water.

Emergency Access: Cottonwood Canyon TH



Elevation



Day 4

Trailhead: Summit of Telescope Peak

Campsite: Stovepipe Wells

Mileage: 15.6 mi.

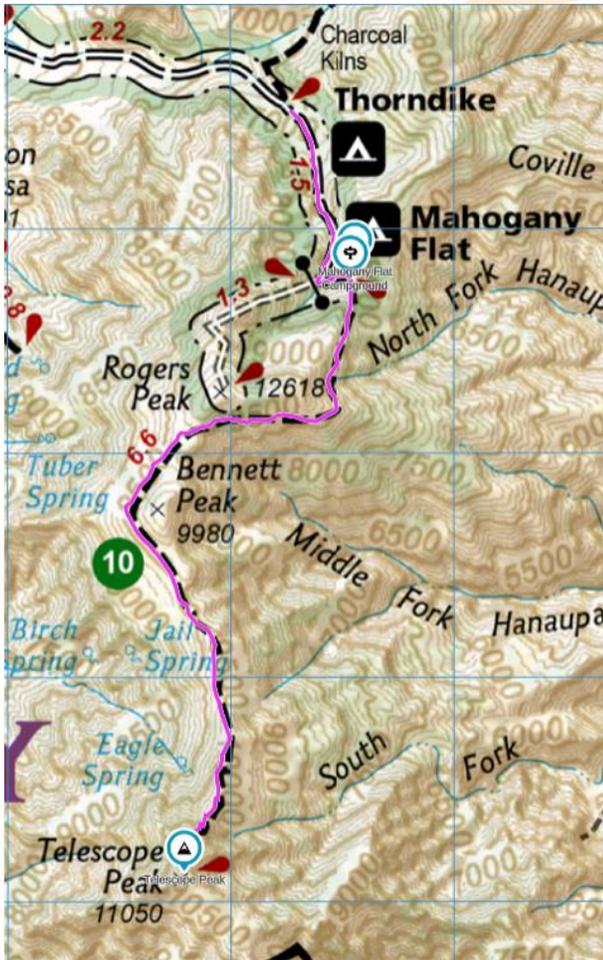
Elevation Gain: 4962 ft.

Elevation Loss: 4962 ft.

Travel Time: 13.66 hrs.

Water Locations: Varies along route. Can be unreliable. Pack in needed water.

Emergency Access: Telescope Peak TH



Elevation



Day 5

Trail: Mosaic Canyon

Campsite: N/A

Mileage: 4.23 mi.

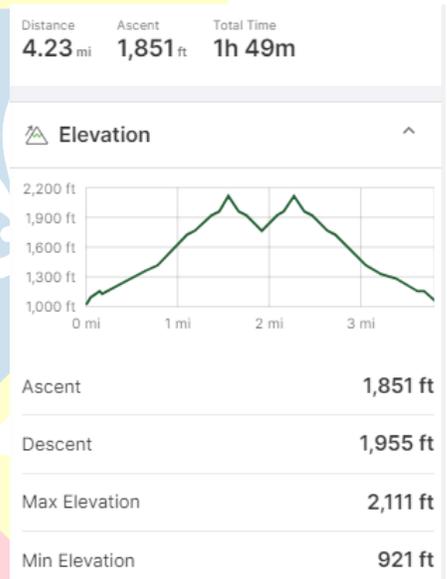
Water Locations: Pack in Water

Emergency Access: Retreat to TH

Elevation Gain: 1851 ft.

Elevation Loss: 1851 ft.

Travel Time: 1 hrs. 49 min.



Day 5 Continued

Trail: Sidewinder Canyon

Campsite: N/A

Mileage: 5.89 mi.

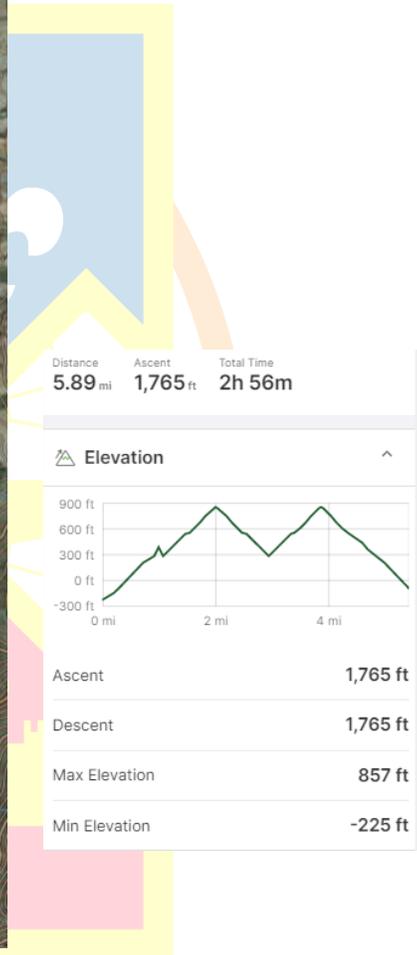
Water Locations: Pack in Water

Emergency Access: Retreat to TH

Elevation Gain: 1765 ft.

Elevation Loss: 1765 ft.

Travel Time: 2 hrs. 56 min.



Day 5 Continued

Trail: Darwin Falls

Campsite: N/A

Mileage: 1.83 mi.

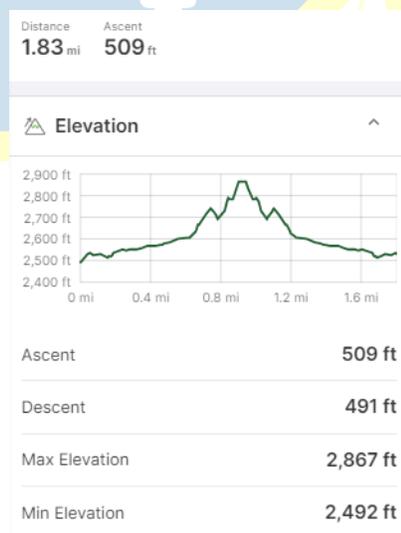
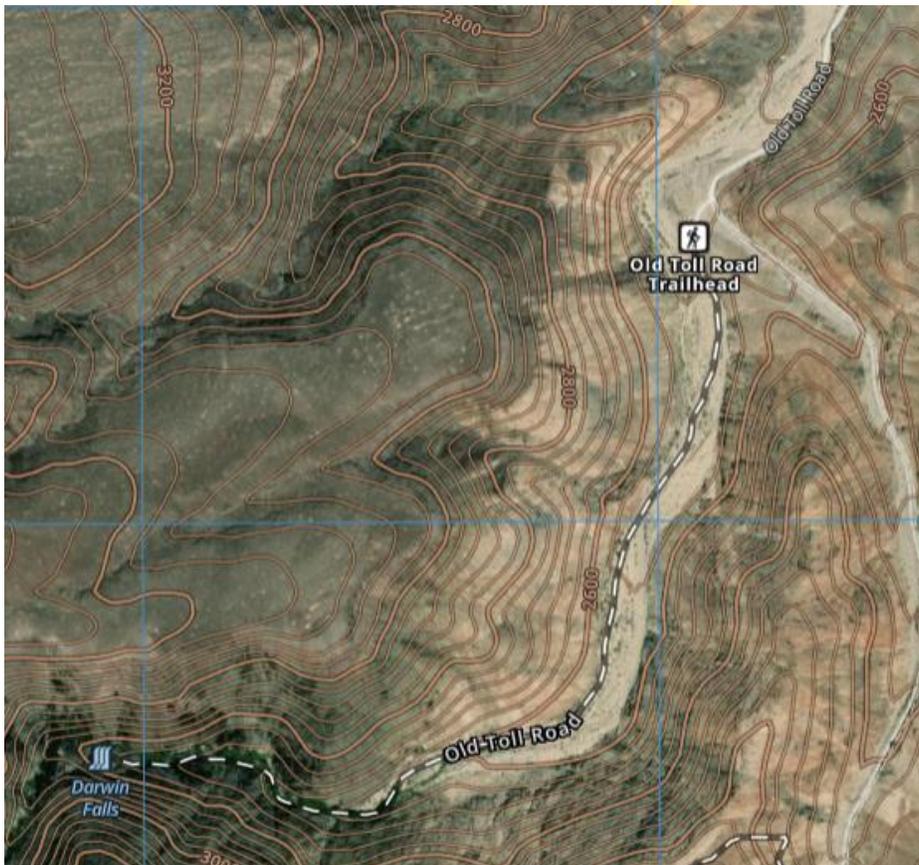
Water Locations: Darwin Falls

Emergency Access: Retreat to TH

Elevation Gain: 509 ft.

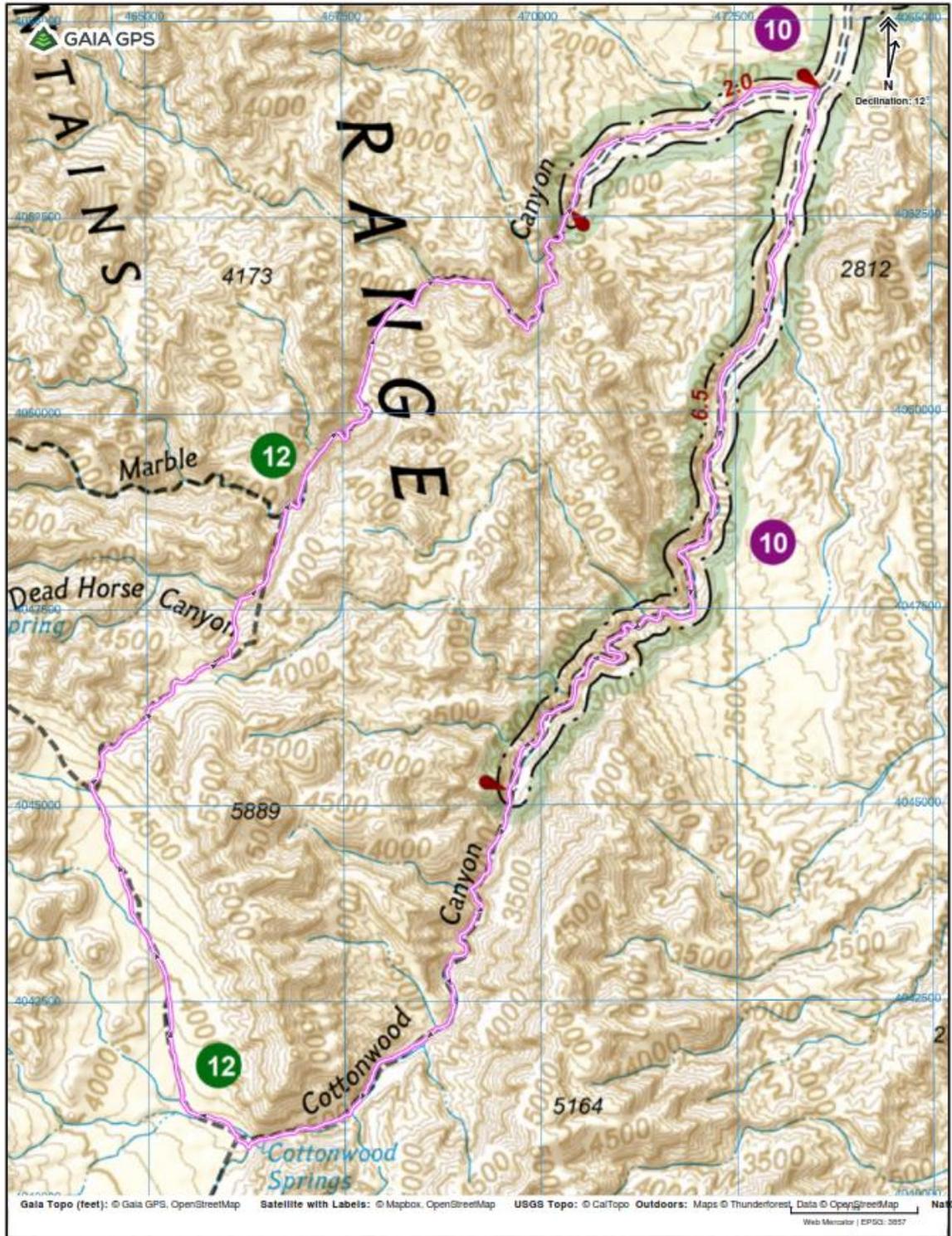
Elevation Loss: 509 ft.

Travel Time: 1 hr.



Topography & Maps

Cottonwood Marble Canyon Loop Topographic Map



Must See Locations

Must-See Locations				
Check out the options below and the map on PAGE 6 for location information for these popular places.				
Location	Description	Walking Required?	Travel from Furnace Creek	
<p>1</p> <p>Badwater Basin</p>	The lowest point in North America, at 282 ft (86 m) below sea level, a surreal landscape of vast salt flats.	You can see the salt flat from your vehicle. A short walk would take you onto the salt flats.	17 mi (27 km) south on Badwater Road 30 minutes	
<p>2</p> <p>Artists Drive</p>	A scenic loop drive through multi-hued hills. The 9 mile (14.5 km) drive is one-way; open to vehicles less than 25 ft (7.6 m) in total length.	Enjoy the views from your vehicle. A short stop at Artists Palette would require exiting your vehicle.	Entrance to the one way road is 8.5 mi (13.7 km) south on Badwater Road 15 minutes	
<p>3</p> <p>Zabriskie Point</p>	Golden colored badlands and a spectacular spot for sunrise.	A 1/4 mi (400 m) distance, 60 ft (18 m) elevation gain walk up a paved path to the viewpoint from the parking area.	4.8 mi (7.7 km) east on Highway 190 15 minutes	
Location	Description	Walking Required?	Travel from Furnace Creek	
<p>4</p> <p>Mesquite Flat Sand Dunes</p>	Tawny dunes smoothly rise nearly 100 ft (30 m) from Mesquite Flat.	The dunes can be viewed from your vehicle.	22.4 mi (36 km) west on Highway 190 30 minutes	
<p>5</p> <p>Dantes View</p>	Breathtaking viewpoint over 5,000 ft (1,500 m) above Death Valley. It was updated in spring 2018 — check out the new exhibits!	No walking required. ADA accessible viewing platform.	12 mi (19 km) east on Highway 190; 13.2 mi (21 km) on Dantes View Road 1 hour	
<p>6</p> <p>Keane Wonder Mine</p>	Best example of a historic gold mine in the park with an intact aerial tramway. <i>Please do not climb on structures or enter mines. Road can be very rough and may require 4x4.</i>	A 1/4 mi (400 m) distance, 85 ft (25 m) elevation gain walk from the parking area to the lowest tram terminal.	10.6 mi (17 km) west on Highway 190; 5.6 mi (9 km) on Beatty Cutoff Road to the unpaved, rough road 35 minutes	
Location	Description	Walking Required?	Travel from Furnace Creek	
<p>7</p> <p>Ubehebe Crater</p>	Hundreds of years ago, a massive volcanic explosion caused by magma mixing with an underground spring left a 600 ft (183 m) deep crater.	The view is a short walk from your vehicle.	17.1 mi (27.5 km) west on Highway 190; 33.4 mi (53.8 km) on North Highway to Ubehebe Crater Road 1.5 hours	
<p>8</p> <p>Charcoal Kilns</p>	These ten beehive-shaped structures are among the best preserved in the west. Built in 1876 to provide fuel to process silver/lead ore.	The kilns can be viewed from your vehicle.	33.6 mi (54 km) west on Highway 190; 28.2 mi (45.4 km) on Emigrant Canyon Road 2 mi (3 km) are gravel 1.5 hours	
<p>9</p> <p>Father Crowley Vista Point</p>	A landscape of lava flows and volcanic cinders gives way to the colorful layers of Rainbow Canyon. Possible viewing of military training flights.	A view into Rainbow Canyon is a short walk from your vehicle.	62.8 mi (101 km) west on Highway 190 1.5 hours	

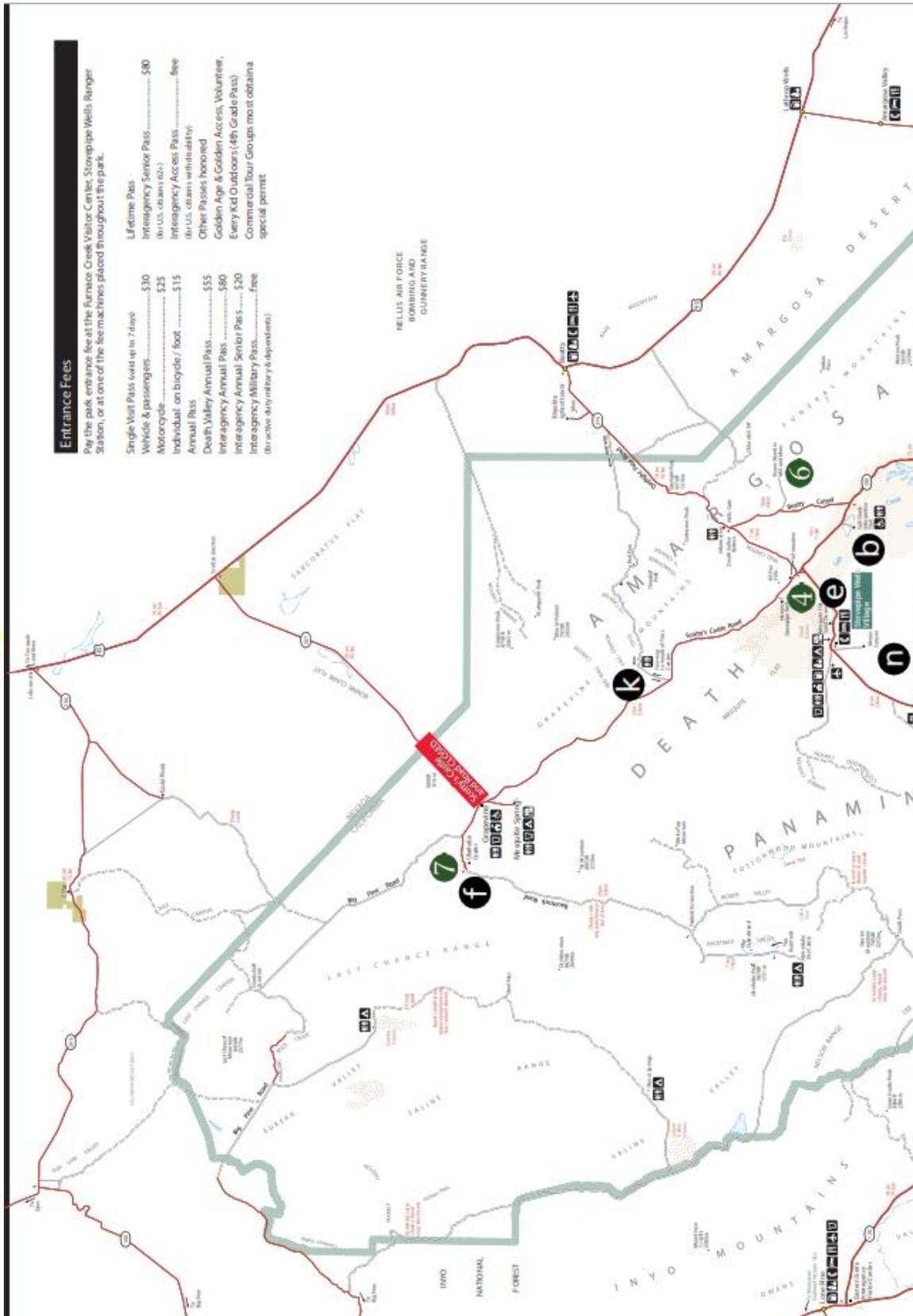
(Photos by Weston Kessler)

Popular Hikes

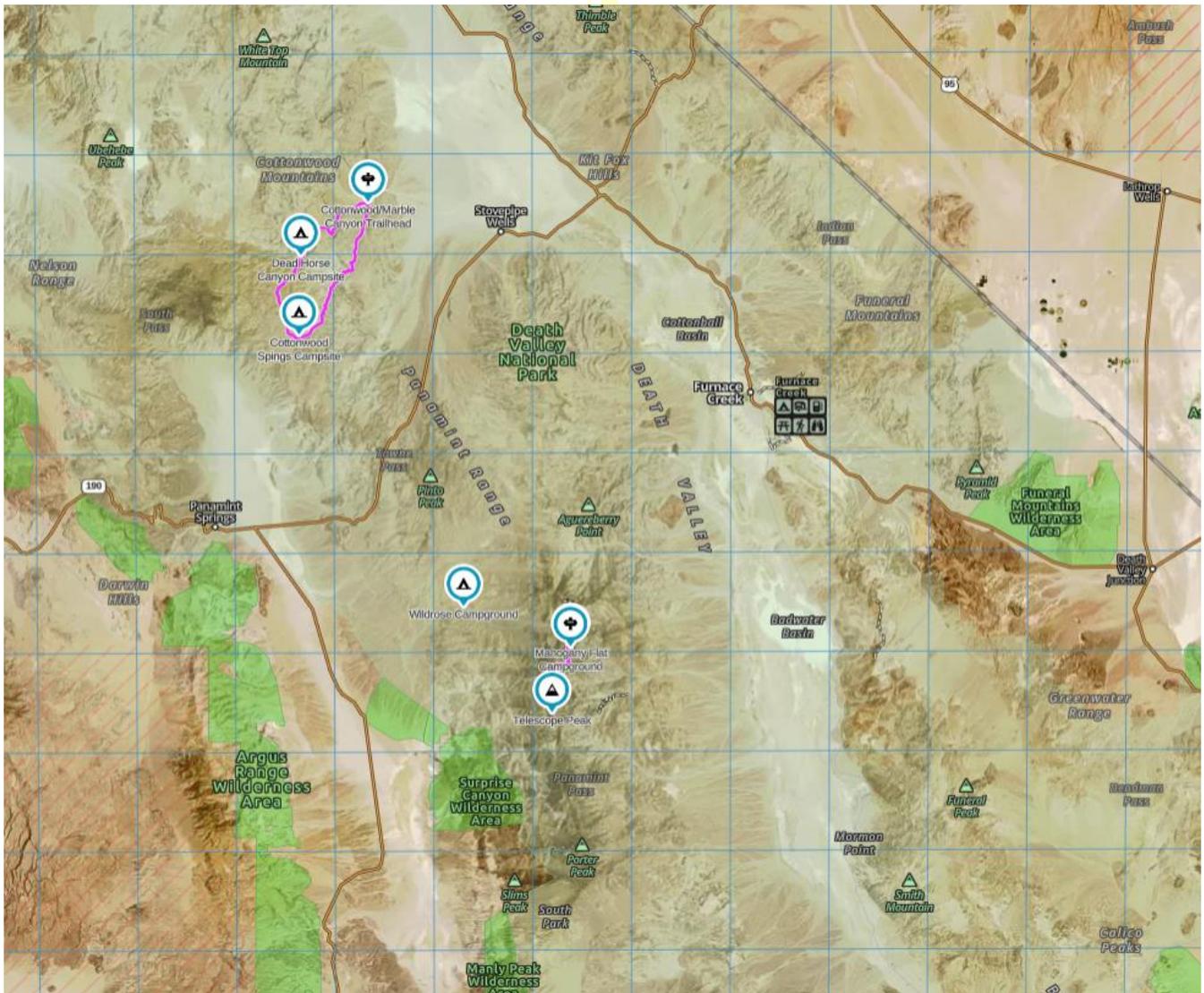
	Easy	Round Trip	Elevation Gain	Description
●	Harmony Borax Works	0.4 mi (0.6 km)	50 ft (15 m)	ADA accessible loop around a mining site where 20-Mule Team wagons began their grueling 165-mile journey south to the Mojave Railroad Depot.
●	Salt Creek Interpretive Trail	0.5 mi (0.8 km)	flat	ADA accessible loop. Wooden boardwalk through salt marsh and rare pupfish habitat. Pupfish can usually be seen in the spring. Great for birding. Unpaved road is typically passable in a sedan.
●	Badwater Salt Flat	1 mi (1.6 km)	flat	ADA accessible out and back. Scenic walk out to the classic geometric shapes in the salt flats and the lowest point in North America.
●	Natural Bridge	1 mi (1.6 km)	180 ft (26 m)	Out and back hike up a dramatic canyon to natural bridge formation. Unpaved access road is typically passable in a sedan, but subject to wash-outs.
●	Mesquite Flat Sand Dunes	2 mi (3.2 km)	185 ft (56 m)	Hike through the largest dune field in the park to the tallest summit. Go during sunrise, sunset, or full moon lighting for unforgettable experiences.
	Moderate	Round Trip	Elevation Gain	Description
●	Ubehebe Crater Rim	1.5 mi (2.4 km)	500 ft (152 m)	Loop hike around the rim of a 600 ft (183 m) deep maar volcano. Head around the loop counterclockwise to include Little Ubehebe Crater.
●	Darwin Falls*	2 mi (3.2 km)	450 ft (137 m)	Out and back hike to desert waterfall. Minor rock scrambling and stream crossing. This is a source of drinking water—no swimming. Unmarked gravel access road just west of Panamint Springs.
●	Badlands Loop/Golden Canyon/ Gower Gulch Loop	2.7 mi (4.3 km) to 4.3 mi (6.9 km)	535 ft (163 m) to 850 ft (259 m)	Trailheads at Golden Canyon and Zabriskie Point provide access to colorful canyons carved through golden badlands. Rangers recommend starting at Golden Canyon and walking the loop back through Gower Gulch.
●	Desolation Canyon	3.6 mi (5.8 km)	600 ft (183 m)	Out and back hike through canyons made of colorful badlands similar to Artists Palette. Some rock scrambling required. No signs, follow the canyon. The unsigned gravel access road is typically passable in a sedan.
●	Sidewinder Canyon	5 mi (8.4 km)	1,580 ft (482 m)	Out and back hike into slot canyons hidden within a labyrinth of drainages. Some scrambling required. No signs; navigation required. Free map available. Unpaved access road is typically passable in a sedan.
●	Fall Canyon	6 mi (9.6 km)	2,460 ft (752 m)	Out and back hike. This canyon with towering walls is a great place to look for bighorn sheep. From the exit of Titus Canyon, hike north on the route near restroom before dropping into the wash at the canyon mouth.
●	Dantes Ridge	8 mi (13 km)	1,200 ft (366 m)	This out and back informal path from Dantes View heads north along the ridge toward Mt. Perry. Unobstructed views begin immediately and only get better. No signs, route is unclear in a few places.
●	Panamint Dunes*	7 mi (11.3 km)	1,028 ft (313 m)	Out and back cross-country hike north up Panamint Valley from Lake Hill Road. The pristine dunes are visible in the distance from the bend in the road, but there is no signage. The unpaved road is not marked.
●	Mosaic Canyon	4 mi (6.4 km)	1,200 ft (366 m)	Out and back hike within polished marble narrows filled with unique color patterns. Use caution on the slick rock surfaces; some rock scrambling is required. Unpaved access road is typically passable in a sedan.
	Difficult	Round Trip	Elevation Gain	Description
●	Wildrose Peak	8.4 mi (13.5 km)	2,200 ft (671 m)	Out and back trail through pinyon-juniper woodlands to 9,064 ft (2,763 m) peak. The final two miles of the access road are gravel, but typically passable in a sedan. Snow and icy trail conditions possible in the winter.
●	Telescope Peak*	14 mi (22.5 km)	3,000 ft (914 m)	Out and back trail to the highest peak in Death Valley at 11,049 ft (3,368 m). The trail starts at Mahogany Flat. The final five miles (8 km) of the gravel access road require high clearance. Road closes due to icy winter conditions.

(*) High clearance/4x4 vehicle recommended

Death Valley Park Map

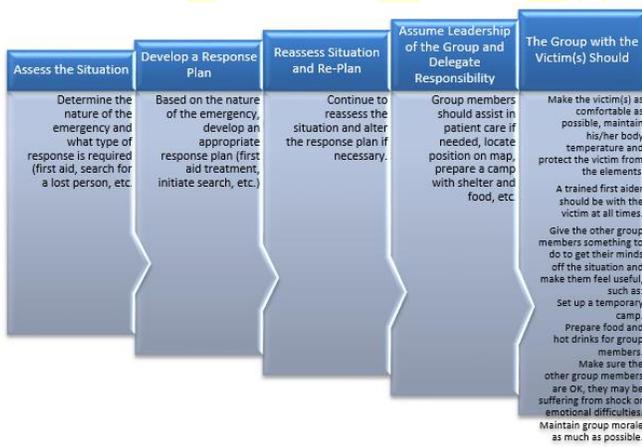


Death Valley Area Map



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.



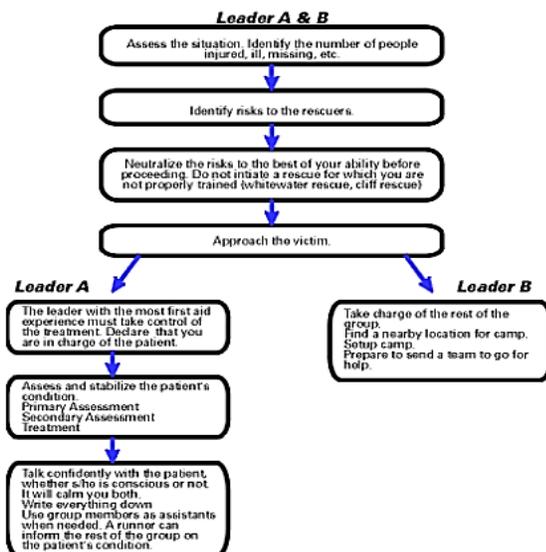
Evacuation Procedures

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 choose 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.

Emergency Response Flow Chart



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?

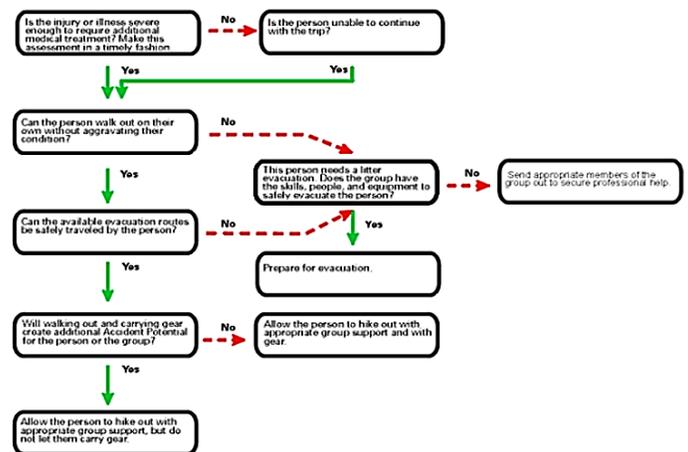
_____ Can you continue to provide the necessary first aid treatment and monitoring during the evacuation?

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

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

Evacuation Flow Chart

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

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

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

Determine appropriate evacuation response

Class I - hikes out on own power

How long will this take?

What if it takes longer?

What if patient's condition deteriorates?

Class II - hikes out with assistance

How long will this take?

What if it takes longer?

What if patient's condition deteriorates?

Class III - needs to be picked up by vehicle

How long will this take?

What if it takes longer?

What if patient's condition deteriorates?

Class IV - needs litter evacuation

How long will this take?

What if it takes longer?

What if patient's condition deteriorates?

Class V - needs helicopter airlift

How long will this take?

What if it takes longer?

What if patient's condition deteriorates?

Determine appropriate professional medical response

Class I - person seen on return to campus

Class II - leaders or support drives person to hospital

Class III - EMS meets groups at trailhead

Class IV - EMS sent in to group

Class V - Advanced Rescue Team or helicopter required

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

Family members

Follow-up

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

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

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

Triage

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

1. Get full SOAP Note from Leader

- History
- Vitals
- Problem list
- Anticipated Problem list

2. Determine exact location of the group.

- Where was the group when the messengers left?
- How far are they from the trailhead?
- What other options are there for reaching the patient? What is the group doing (staying put or hiking out?)
- How will the time lengths of different evacuation modes affect the medical condition/treatment?

3. Contact outside experts as needed to develop emergency response plan

- Based on problem as defined in #1 and #2 determine the "need for speed."
- Implement the appropriate professional medical response as indicated above.

Communications and Navigation

Recommended Communication Equipment

Motorola T600 H20 2-Way Radio		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 H20 2-way radios will keep you in contact with your adventure partners on land or water, thanks to a 35-mile range and a floating, waterproof design and LEDs that light up in water. An emergency alert button transmits an alert siren followed by spoken or incidental sounds to warn others of your peril, and has a built-in LED flashlight for emergencies.</p> <p>Push-To-Talk (PTT) power boost allows you to extend the transmission range by increasing the transmitter power output. Hands-free communication is provided by iVOX/VOX, which acts like a speakerphone to keep your hands free as you hike</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 devices • Optional inReach weather forecast service provides detailed updates directly to your inReach Mini or paired device; basic and premium weather packages available • Send and receive inReach messages through compatible Garmin devices, including connected wearables and handhelds 	
Emergency Frequency:		Garmin Link for Tracking:	
Ranger Frequency:			

Recommended Tracking & Emergency Signal Devices

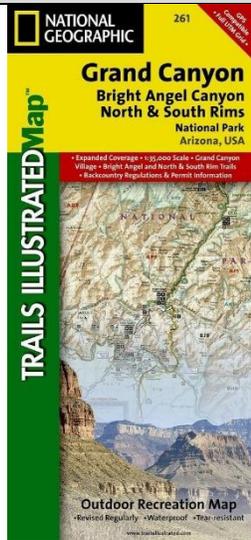
Garmin Rino 755t	
	<p>We will have one Rino device for navigation, gps tracking and emergency communications. High-sensitivity GPS with GLONASS satellite reception tracks satellites in more challenging environments than GPS alone.</p> <p>Powerful, 5 watt FRS/GMRS 2-way radio lets you communicate by voice call or unit-to-unit text messaging. 3 in. color touch-screen with dual orientation and sunlight-readable display.</p> <p>Bluetooth® connectivity supports a wireless headset (not included) for improved voice communication.</p> <p>3-axis compass with accelerometer and barometric altimeter sensors.</p> <p>NOAA weather radio, Active Weather forecasts and animated weather tracking help you stay one step ahead of changing conditions.</p> <p>Geocaching Live connects with Geocaching.com to download the caches you want while you're on the go.</p> <p>Position Reporting shows you the location of other Rino users on the same channel and lets you alert them if you need help.</p>

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 GPSMap



Precise navigation meets global communication in the rugged GPSMAP 66i button-operated GPS handheld and satellite communicator¹ featuring Garmin TopoActive mapping and inReach[®] technology.

- Send interactive SOS alerts anytime, from anywhere in the world.
- No matter where you are, two-way messaging lets you connect to the ones who matter.
- Let loved ones know precisely where you're roaming with location tracking and sharing.
- Know the terrain before you're in it, with preloaded TopoActive maps of the U.S. and Canada.
- Stay out there longer with up to 35 hours of battery life in tracking mode and up to 200 hours in Expedition mode.

Navigation Enabled Watch

Garmin Fenix



- Ultimate multisport GPS watch with full-color TOPO U.S. mapping, routable cycling maps and other outdoor navigation features

- Fit for adventure with rugged design that features stainless steel bezel, buttons and rear case: Physical size 5.1 x 5.1 x 1.8 cm; Weight - silicone band: 98 g ; metal band: 196 g

- Built-in navigation sensors include GPS and GLONASS capability

to track in more challenging environments than GPS alone as well as 3-axis compass, gyroscope and barometric altimeter

- Preloaded run profiles: running, treadmill running, trail running. Put key stats at your fingertips with the performance widget that shows your training status, training load and more
- Provides built-in mapping and navigation features to help keep you oriented and on course. Full-color TOPO mapping comes preloaded with map data optimized for at-a-glance navigation and location tracking.
- Features multinetwork (GPS, GLONASS and Galileo) satellite reception to track in more challenging environments than GPS alone. In addition to map-based guidance, each watch also provides a set of ABC (altimeter, barometer and compass) sensors for outdoor navigation. The built-in altimeter provides elevation data to accurately monitor ascent and descent for activities such as hiking, while the tilt-compensated three-axis electronic compass keeps your bearing — whether you're moving or not.

Note: AcadianX Guides are equipped with all mentioned gear.

Clothing Essentials

Layering Basics

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

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

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

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

Cold, Rainy and Hot Layering Examples

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

Cold-weather layers:

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



Rainy-weather layers (cool temps):

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



Hot-weather layers:

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

You have literally dozens of alternatives and options for each of these layers. The trick is to go with options that

make the most sense for where you're headed, what you're doing and what you're able to spend.

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



Base Layer: Moisture Management

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



Base layer materials: You have a wide range of fabric options, including synthetics like polyester and nylon, or natural fibers like merino wool and silk. Though there are subtle differences in wicking and drying for each material, and in odor retention and durability, a lot of 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	<i>Boot/Shoe/ Trail Runner</i>	Salomon Merrel Obre La Sportiva	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	<i>Torso</i>	Tesla Patagonia Norrna SmartWool	Must wick away moisture, contact the skin, and recommended to have anti-microbial properties.
	<i>Legs</i>	Tesla Under Armor	Must wick away moisture, contact the skin, and recommended to have anti-microbial properties.
Middle Layer	<i>Fleece/Puffys/ Synthetics</i>	Mountain Hardware REI Co-Op North Face Arc'teryx Patagonia	Insulation layer for thermal protection. Can include fleece and puffy jackets. A synthetic fill is recommended for damp conditions
	<i>Leggings</i>	SmartWool Ortovox Outdoor Research	Insulation layer for thermal protection.
Outer Layer	<i>Hardshell/Softshell/ Windshell</i>	Patagonia Outdoor Research Mountain Hardware Rab Arc'teryx Mammut	Should be durable, moisture resistant, quick drying and light weight.
	<i>Pants/Shorts</i>	Kuhl Outdoor Research REI Co-Op Arc'teryx	Should be durable, moisture resistant, quick drying and light weight.
Briefs/Boxers	<i>Synthetic/ Merino Wool</i>	Exoficcio Saxx (Quest 2.0) SmartWool Icebreaker	Needs to be synthetic, anti-microbial, breathable, and moisture wicking. At least 3 pairs.
Socks	<i>Hiking Sock</i>	Smart Wool Darn Tough Wigwam	Good hiking socks are a must. A two-layer system is recommended to reduce friction. A good Merino Wool is recommended. You will need at least 3 pairs.
	<i>Sock liner</i>	REI Co-Op Injinji Sealskinz	
Head Gear	<i>Beanie</i>	Smartwool Outdoor Research North Face	Should be snug on your head and keep you warm and effectively cover your ears.
	<i>Neck Gaiter/ Cravat</i>	Buff	Most versatile piece of clothing you will have. A must on the trail.
Gloves	<i>Hiking</i>	<i>Any reasonable brand should do</i>	Gloves - a good pair of padded fingerless biking gloves will help prevent blisters when using trekking poles.
	<i>Liner</i>	Outdoor Research Manzella Sealskinz Arc'teryx	Should keep your hands warm up to 30° F, recommend to be water resistant and touch screen compatible
	<i>Thermal Gloves/ Mittins</i>	Outdoor Research Black Diamond Manzella Hestra	Waterproof is preferable. Need to keep you warm even when wet outside.
Rain Shell	<i>Jacket/Pants</i>	REI Co-Op Arc'teryx Outdoor Research Rab Marmot	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.

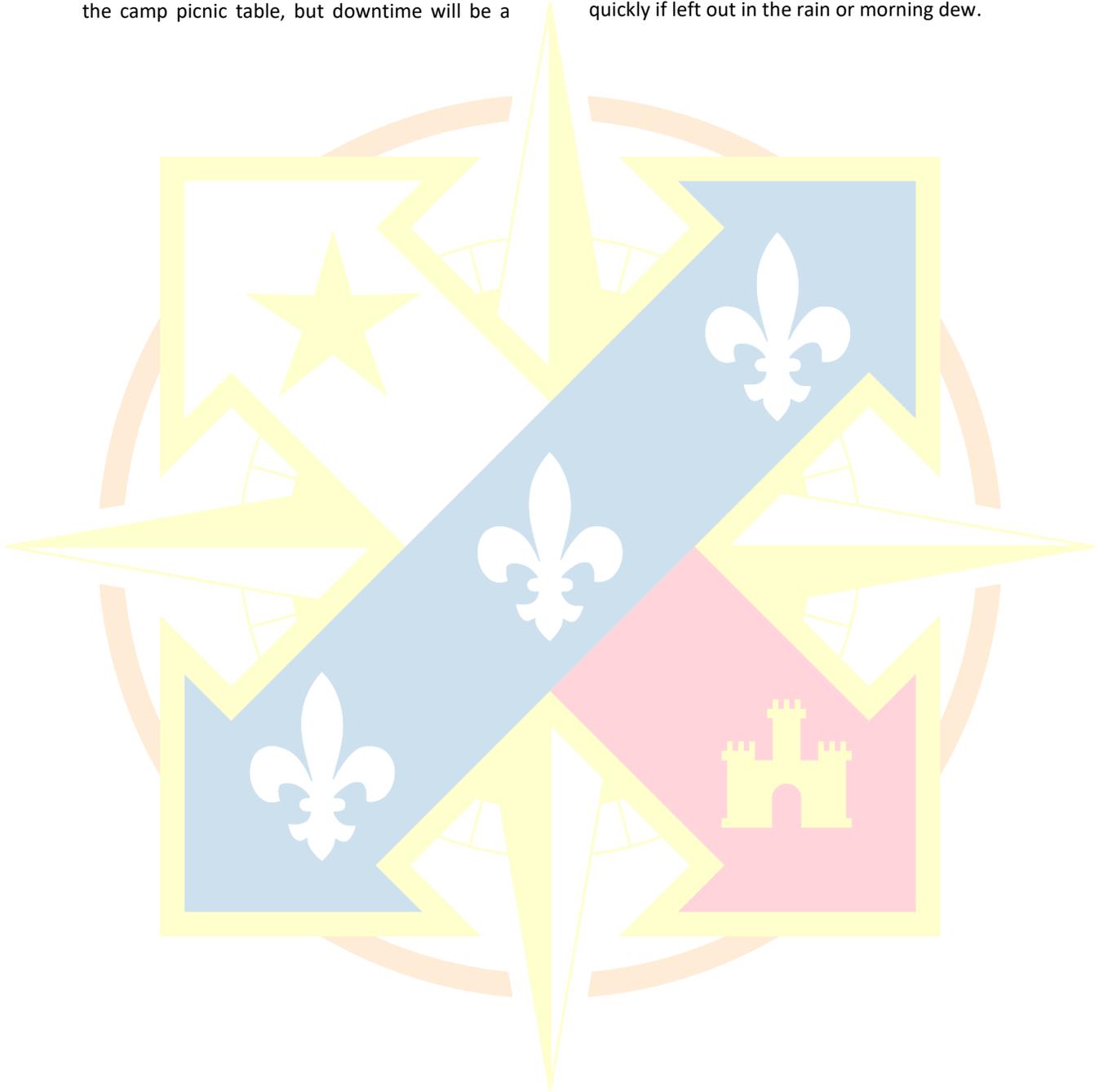
- **Lighting:** Campsites don't have illumination, so you have to bring your own. A flashlight is OK, but a headlamp frees up your hands for camp tasks. A lantern is nice for ambient light. (You can also build a campfire, but watch for fire restrictions.)
- **Stove:** A classic two-burner propane camp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

Gear System	Style	Brands	Notes
Packing	<i>Backpack</i>	Osprey Granite Gear (UL) Gossamergear (UL)	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 REI Co-Op	Make sure the cover fits completely around your pack when fully loaded.
	<i>Kit Bags</i>	Osprey	These are handy to organize small items in your pack
Shelter	<i>Double Wall 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.
	<i>Single Wall Tent & Tarps</i>	ZPack (UL) Six Moon Designs (UL) Tarptent (UL) Mountain Laurel (UL) Gossamergear (UL)	These are lightweight options for ultralight hikers. They are prone to condensation. They require advanced skill levels to pitch and use effectively.
	<i>Bivy</i>	REI Co-Op Outdoor Research	These are hot and stuffy. Can be claustrophobic. Virtually no living space.
	<i>Hammock</i>	Clark Products Dutchware ENO Hennessy Warbonnet	In order for a hammock to be an effective shelter you need to have a complete system that is comprised of a Waterproof tarp, a Top-quilt or sleeping bag, The Hammock itself with built-in or separate bug mesh, a Under-quilt or sleeping pad, and a Suspension system
Sleep System	<i>Sleeping Bag</i>	Big Agnes Marmot REI Co-Op Nemo Sierra Designs Feathered Friends (UL) Enlightened Equipment (UL)	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	Should be small enough to fit inside your bag.

Gear System	Component	Brands	Notes
Cooking	<i>Canister Stove</i>	Soto MSR Snow Peak	Simplest option.
	<i>Canister System Stove</i>	Jetboil	Convenient integrated system. Most efficient.
	<i>Alcohol/Solid Fuel Stove</i>	Trail Designs (UL)	This is the most lightweight option. Not as efficient as the others.
	<i>Cookware</i>	GSI Snow Peak Toaks	Titanium works best. Size is based on your needs.
	<i>Utensils</i>	Snow Peak Sea to Summit	Need to be lightweight with a small footprint. I prefer one with a long handle.
Health, Hygiene & Safety	<i>First Aid Kit</i>	Adventure Medical Kits Surviveware	Size of kit is based on duration of your trip and number of people in your group.
	<i>Wipes</i>	Dude Wipes Sea to Summit	Must be biodegradable.
	<i>Water Filter</i>	Sawyer Katadyn Platypus	It is the most efficient method but is only effective against large pathogens but not effective against viruses. I prefer a gravity fed filter as opposed to inline.
	<i>Sunglasses</i>	Kaenon Costa Del Mar	Ensure they have UVA and UVB protection.
Personal Gear/Tools	<i>Gaiters</i>	Outdoor Research Rab	Great for mud and snow. Style is based on personal preference.
	<i>Trekking Poles</i>	Black Diamond Leki	Need to be durable and dependable. Don't buy cheap, they WILL break.
	<i>Camp Chair</i>	TravelChair REI-Co Op Big Angles	The lighter the better. Not a necessity.
	<i>Head Lamp</i>	Black Diamond Petzl	Having a locking mechanism can save your butt. Pay attention to Lumens and battery life.
	<i>Multi-tool</i>	Leatherman Gerber	Doesn't have to be overly fancy. Just needs to be light and have the basics.
Navigation/ Electronics	<i>Radio</i>	Motorola	Used for communicating with other members of your team. Need to be weatherproof and at least splash resistant.
	<i>Battery Pack Charger</i>	Anker	The more charges it has, the heavier it will be so find a balance. Keeping it in a protective case with all the necessary wires is ideal.
	<i>Solar Power</i>	X-Dragon BigBlue ECEEN	This option is dependent on weather so be weary. The larger the solar panel the more efficient it is.
	<i>GPS</i>	Garmin	These are nice to have and are durable. However, a well-protected phone can be a viable option.
	<i>PLB & Satellite Messaging</i>	Garmin Spot	This is a must and could save your life one day.
	<i>GPS/Altimeter Sports Watch</i>	Garmin Suunto	These are a great tool and convenient when on the move. I have tested the Garmin Fenix for 5 years and it has never let me down.
	<i>Compass</i>	Suunto Silva Brunton	You want a baseplate compass specific for wilderness navigation and preferably with adjustable declination. Having an attached sighting mirror is a nice option but not essential
	<i>Maps</i>	USGS Topographic National Geographic Trail Maps	Keep in mind when using NatGeo Maps that the scale is not consistent from map to map. When orienting using their maps adjust your measurements accordingly.

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/>

Total Base Weight _____ lbs.

AcadianX Gear Checklist (3 – Season/Backpacking)

Packing System:

- Backpack _____ lbs.
- Daypack* _____ lbs.
- Compression/Stuff Sack _____ lbs.
- Pack/Rain Cover _____ lbs.

Shelter System:

- Tent/Hammock _____ lbs.
- Tent Pad _____ lbs.

Sleep System:

- Sleeping Bag _____ lbs.
- Sleeping Pad _____ lbs.
- Camp Pillow* _____ lbs.

Kitchen System:

- Stove/Burner _____ lbs.
- Fuel _____ lbs.
- Pot/Cup _____ lbs.
- Utensil _____ lbs.
- Fire Kit** _____ lbs.

Personal Gear/Tool System:

- Trekking Poles* _____ lbs.
- Gaiters* _____ lbs.
- Camp Chair* _____ lbs.
- Knife _____ lbs.
- Multi-tool _____ lbs.
- Traction _____ lbs.
- Repair Kit ** _____ lbs.

Navigation/Electronics System:

- Topo/Trail Map _____ lbs.
- Compass _____ lbs.
- GPS _____ lbs.
- PLB & Sat. Messaging _____ lbs.
- Waterproof VHF Radio* _____ lbs.
- Battery Charging Kit** _____ lbs.
- Phone* _____ lbs.

- Flashlight/lamp _____ lbs.
- Headlamp _____ lbs.

Health, Hygiene, and Safety System:

- First Aid Kit _____ lbs.
- Water Bottle/Bladder _____ lbs.
- Water Treatment _____ lbs.
- Hygiene Kit** _____ lbs.
- Foot Care Kit** _____ lbs.
- Sunscreen & Lip Balm _____ lbs.
- Insect Repellent _____ lbs.
- Personal Medication _____ lbs.
- Sunglasses _____ lbs.
- Pack Towel _____ lbs.

Clothing System:

- Base Layer – Torso _____ lbs.
- Base Layer – Legs _____ lbs.
- Insulation Layer – Torso* _____ lbs.
- Insulation Layer – Legs* _____ lbs.
- Outer Layer – Torso _____ lbs.
- Outer Layer – Legs _____ lbs.
- Briefs x 3 _____ lbs.
- Socks x 3 pair _____ lbs.
- Hiking Boots _____ lbs.
- Belt _____ lbs.
- Hat _____ lbs.
- Beanie* _____ lbs.
- Hiking Gloves _____ lbs.
- Thermal Gloves* _____ lbs.
- Shell Layer _____ lbs.
- Sleep Clothes _____ lbs.
- Camp/Water Shoes* _____ lbs.

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

AcadianX Gear Checklist (Kit List)

Fire Kit: Total wt: _____ lbs.

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

Battery Charging Kit: Total wt: _____ lbs.

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

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.

Hygiene Kit: Total wt: _____ lbs.

- Toothbrush _____ lbs.
- Toothpaste _____ lbs.
- Floss/toothpick _____ lbs.
- Personal Wipes _____ lbs.
- Sanitizer _____ lbs.
- Trowel _____ lbs.
- Blue Bags _____ lbs.

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

Foot Care Kit: Total wt: _____ lbs.

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

Logistics

Travel

Our plan is to travel by air from Lafayette, LA to Las Vegas, NV where we will pick up our vehicle and make a supply run. We will also stop at the local REI so you may pick up any last-minute items. Next, we will transit to Death Valley and make camp at Stovepipe Wells. Use this sheet to fill in logistical information once it becomes available.

Departure

Route: _____
Date: _____
Depart Time: _____
Arrival Time: _____

Return

Route: _____
Date: _____
Depart Time: _____
Arrival Time: _____

Lodging

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

Lodging 1 Name: _____ Check-In Date: _____
Lodging 2 Name: _____ Check-In Date: _____
Lodging 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: _____

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.

