



# United States Department of the Interior

## NATIONAL PARK SERVICE

Death Valley National Park

P.O. Box 579

Death Valley CA 92328

IN REPLY REFER TO:

K14 (DEVA)

Dear Educator,

We appreciate your interest in promoting Death Valley National Park in your classroom. Enclosed is a copy of the park's newspaper and a few additional materials that offer general information about the park's resources and specific information regarding current activities and up coming events. In an attempt to conserve paper, postage, and electricity we are recommending teachers and the public in general utilize our web site to obtain resource information about Death Valley National Park. You can access our web site at [www.nps.gov/deva](http://www.nps.gov/deva). Information on the park's natural and cultural history, camping, hiking, geology, weather, and many other subjects can quickly be at your fingertips with a few clicks of a mouse. The color photographs on our site can be printed by clicking on the area desired. If you are specifically looking for geological information, we recommend the link to the U.S. Geological Survey's Death Valley National Park site.

If you have specific questions or are planning a visit to the park, please feel free to contact our Education Specialist at: 760/786-3226. If you require a Fee Waiver, please call our fee collection operation at 760/786-3247 or fax your request to 760/786-2217. Please make Fee Waiver requests at least a month in advance.

For more in-depth references and resources, we recommend you visit the Death Valley Natural History Association web site at [dvnha.org](http://dvnha.org) and review their sales items and books. The Natural History Association offers discounts to their members as well as members of other National Park Service cooperating associations.

We hope this information will help you and your students with your studies of Death Valley National Park.

Sincerely,

James T. Reynolds  
Superintendent

# Death Valley

National Park Service  
U.S. Department of the Interior



Death Valley National Park

## Death Valley R.O.C.K.S! Recreational Outdoor Campaign for Kids thru Study



**Why We're Here** The future of the Mojave Desert and our public lands depends on the next generations. Death Valley National Park is working with teachers to prepare today's students to take over the responsibility of preserving and protecting our environment. The park offers free, ranger-led, curriculum-based programs to the students of California and Nevada. Programs incorporate the state standards for education and include materials for pre, post, and onsite activities. Join us for an adventure in learning!

### Day Programs

**Time:** Mon- Fri

**Group Size:** 70 students plus teachers and chaperones

**Transportation:** Provided by visiting school

**World of the Small** 3<sup>rd</sup> – 4<sup>th</sup> grade

Students and teachers explore the world of the Salt Creek Pupfish. During this trip, the students will learn what challenges face this little fish and how biologists study and manage the habitat.

**Desert Survivors** any grade level

Students and teachers explore the flora and fauna of Death Valley and the unique adaptations they have for survival in the desert. The area will be chosen based on your desires and the age of your students.

**If you have another age group or another topic that you would like to study, let us know and we will work to create a program to meet your needs**

**Rockin' Out** any grade level

Students and teachers explore the geologic changes that shape our Earth first hand. They will be introduced to the rock cycle, plate tectonics, and how to recognize the geologic changes that surround them. There are many wonderful areas in the park where this program can take place. The area will be chosen based on your desires and the age of your students.

Teachers are asked to conduct pre- and post-site activities



## Camping Programs



**Days:** Mon-Wed or Wed-Fri

**Group Size:** 50 students plus teachers and chaperones

**Transportation:** Provided by school

\*Financial assistance may be available

**Grades:** 6<sup>th</sup> – 8<sup>th</sup> \*Ask about availability for other grades

Over three days and two nights, students participate in a variety of activities that will introduce them to the unique flora and fauna, geology, and history of Death Valley National Park. Thanks to the help of the Death Valley Natural History Association, we are able to provide group tents, camp stoves, cooking equipment and utensils, and cleaning supplies.

The Death Valley ROCKS! program incorporates a resources management work project in every visit. Each group of students participating in the program conducts hands-on activities designed to assist our resources staff in very real research and/or restoration. The students become immediate stakeholders in the future of Death Valley National Park.

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**Scheduling a Program** To schedule a program, contact the Education Specialist at 760-786-3226. Registration is on a first-come/ first-served basis. Programs are offered mainly during the winter months of Oct-April.

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## Distance Learning



Students from around the world can learn how desert species have adapted to living in such a harsh environment through an interactive electronic field trip. Coyotes, tortoises, pupfish, and big horn sheep lead the way to discovery of adaptations, food chains, habitats, and much more!

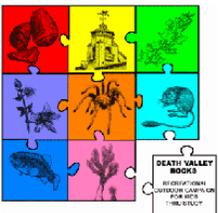
To access the e-field trip follow the link on the Distance Learning Opportunities page of our website or go directly to [www.efieldtrips.org](http://www.efieldtrips.org).

Other Distance Learning Opportunities await on our webpage.:

<http://www.nps.gov/deva/forteachers/distancelearningopportunities.htm>

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## Curriculum Materials



Our education department has authored two original curriculum guides and have partnered with other Mojave Desert parks to create two others. These guides facilitate classroom learning about the Mojave Desert. Each guide is available for download from our website at <http://www.nps.gov/deva/forteachers/curriculummaterials.htm>

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## Education Office

(760) 786-3226 phone

<http://www.nps.gov/deva/forteachers/>

(760) 786-3224 fax



# Death Valley National Park



## eFieldTrip

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## Cool Creatures in a Hot Place!

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A new way to introduce students to Desert Animal Adaptations

- Internet-based activity
- Developed to meet 4<sup>th</sup> Grade California State Education Standards
- Used Successfully got Grades 3-8
- **FREE**
- To access:
  - Go to [www.nps.gov/deva/forteachers](http://www.nps.gov/deva/forteachers)
  - Click on the "Distance Learning Opportunities" link
  - Register and have fun learning!
  - You can also access directly through [www.efieldtrips.org](http://www.efieldtrips.org)



# Weather and Climate



## Death Valley National Park

- ◆ **Death Valley is famous as the hottest, driest and lowest place in North America.**
- ◆ **Higher elevations are cooler than the low valley. Temperatures drop 3° to 5° F with every thousand vertical feet.**
- ◆ **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.**
- ◆ **Weather data was compiled from park and National Weather Service record summaries for the years 1911 through 2005 for Furnace Creek in Death Valley, California.**

### Temperatures and Precipitation

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Year
daily high (average)	65° F 18° C	72° F 22° C	80° F 27° C	90° F 32° C	99° F 37° C	109° F 43° C	115° F 46° C	113° F 45° C	106° F 41° C	92° F 33° C	76° F 24° C	65° F 18° C	90° F 32° C
daily low (average)	39° F 4° C	46° F 8° C	53° F 12° C	62° F 17° C	71° F 22° C	80° F 27° C	88° F 31° C	85° F 29° C	75° F 24° C	62° F 17° C	48° F 9° C	39° F 4° C	62° F 17° C
record high	89° F 32° C	97° F 36° C	102° F 39° C	111° F 44° C	122° F 50° C	128° F 53° C	134° F 57° C	127° F 53° C	123° F 50° C	113° F 45° C	97° F 36° C	88° F 31° C	134° F 57° C
record low	15° F -9° C	25° F -4° C	30° F -1° C	35° F 2° C	42° F 6° C	49° F 10° C	52° F 11° C	64° F 18° C	41° F 5° C	32° F 0° C	24° F -4° C	19° F -7° C	15° F -9° C
precipitation	.26" 0.7cm	.35" 0.9cm	.25" 0.6cm	.12" 0.3cm	.08" 0.2cm	.04" 0.1cm	.11" 0.3cm	.10" 0.3cm	.14" 0.4cm	.11" 0.3cm	.18" 0.5cm	.18" 0.5cm	1.92" 4.9cm

### Changing rainfall patterns

Rainfall is 50% higher now than in the recent past. Yearly precipitation consistently averaged about 1.6 inches of rain for the first 60 years of record keeping. The last 30 years has seen an increase, averaging 2.5 inches of rain a year.

### Longest summers

The greatest number of consecutive days with a maximum temperature of 100° F or above was 154 days in the summer of 2001. The summer of 1996 had 40 days over 120° F, and 105 days over 110° F. The summer of 1917 had 43 consecutive days with a high temperature of 120° F or above.

### The highest ground temperatures

The highest ground temperature recorded was 201° F at Furnace Creek on July 15, 1972. The maximum air temperature for that day was 128° F. Ground temperature on the valley floor is about 40% higher than the surrounding air temperature.

# Why is Death Valley's climate so extreme?

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## Why so Dry?

Winter storms moving inland from the Pacific Ocean must pass over mountain ranges to continue east. As the clouds rise up they cool and the moisture condenses to fall as rain or snow on the western side of the ranges. By the time the clouds reach the mountain's east side they no longer have as much available moisture, creating a dry "rainshadow".

Four major mountain ranges lie between Death Valley and the ocean, each one adding to an increasingly drier rainshadow effect.

## Why so hot?

The depth and shape of Death Valley influence its summer temperatures.

The valley is a long, narrow basin 282 feet (86 m) below sea level, yet is walled by high, steep mountain ranges.

The clear, dry air and sparse plant cover allow sunlight to heat the desert surface. Heat radiates back from the rocks and soil, then becomes trapped in the valley's depths. Summer nights provide little relief as overnight lows may only dip into the 85°F to 95°F (30°C to 35°C) range.

Heated air rises, yet is trapped by the high valley walls, is cooled and recycled back down to the valley floor. These pockets of descending air are only slightly cooler than the surrounding hot air. As they descend, they are compressed and heated even more by the low elevation air pressure. These moving masses of super heated air blow through the valley creating extreme high temperatures.

## Weather Landmarks:

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**1911** Permanent weather station established at Greenland Ranch now known as Furnace Creek Ranch.

**1913** 4.54 inches (11.5 cm) of rain held calendar year record for 92 years.  
**Coldest temperature:** 15°F (-10°C) recorded on January 8.  
**Hottest temperature:** 134°F (57°C) recorded on July 10 - five consecutive days reach 129°F (54°C) or above. Held record for the hottest place on earth until 1922.

**1917** 52 days 120°F (49°C) or above with 43 of them consecutive.

**1922** 1/2 inch (1.3 cm) of snow, January 29

**1922** 136°F (58°C) at Azizia, Libya in the Sahara Desert. Current world record high temperature.

**1929** No rain recorded.

**1931-34** Driest stretch on record - 0.64 inches (1.6cm) of rain over a 40 month period.

**1933** Official park weather station moved to Cow Creek, 3 miles north of Furnace Creek.

**1953** No rain recorded at Greenland Ranch.

**1960** 129°F (54°C) recorded on July 18 at Greenland Ranch.

**1961** Official weather station opens at new Visitor Center in Furnace Creek. Cow Creek and Greenland Ranch stations close.

**1976** Floods wash out Golden Canyon Road - record five day February storm brings 2.37 inches (6.0 cm) of rain.

**1977-78** 5.09 inches (12.9 cm) of rain - rainy season record until 1987-88.

**1983** 4.54 inches (11.5 cm) of rain.

**1984** Summer floods close park roads for several weeks - 4.04 inches (10.3 cm) of rain for year.

**1987-88** 5.43 inches (13.8 cm) of rain - rainy season record until 1997-98.

**1995** Wettest month ever recorded in Death Valley - 2.59 inches (6.6 cm) of rain in January.

**1996** Hottest summer on record - 40 days over 120°F (49°C)

**1997-98** 6.09 inches (15.5 cm) of rain Spectacular wildflower bloom.

**1998** 129° F (54°C) recorded on July 17.

**2001** 154 days in a row of 100° F (38°C) or above

**2004** August floods kill two and close park for nine days. Some roads are closed for months.

**2004-05** 6.44 inches (16.4 cm) of rain. Wettest rainy season (July-June) on record.

**2005** 4.73 inches (12.0 cm) of rain - breaks 92-year old calendar year (Jan.-Dec.) record. Spectacular wildflower bloom.  
129° F (54°C) recorded on July 19.



# Twenty Mule Teams

## Death Valley National Park



For many people, nothing symbolizes Death Valley more than the famous Twenty Mule Teams. These “big teams” pulled massive wagons hauling borax from the Harmony Borax Works near Furnace Creek to the railhead near Mojave, a grueling 165 mile, ten day trip across primitive roads.

Although the teams only ran for six years--1883 to 1889--they have made an enduring impression of the Old West. This is primarily due to a successful advertising campaign promoting 20-Mule-Team Borax Soap and the long-running *Death Valley Days* radio and television program.

Today the twenty mule teams are only a fond memory, but you may see two of the last remaining wagons here in Death Valley; one is in front of the Furnace Creek Ranch and the other is at Harmony Borax Works.



*Imagine a conversation with a Twenty Mule Team muleskinner...*  
I'm a muleskinner, proud to be one and good at my job. I don't skin mules--I drive 'em, that's what muleskinner means. You may not know it, but mules is the smartest things on 4 feet. Speakin' of smart, I work for a real smart man named Coleman who owns the Harmony Borax Works right here in Death Valley. He'd seen some muleskinners drivin' 8 or 12 mules at a time and they was haulin' some pretty heavy loads, so ole man Coleman he thinks to himself, if 8 mules can pull 10 tons and 12 can pull twice that, it stands to reason that if you hook 20 mules up and build bigger wagons, them mules should be able to pull nigh unto 40 tons. So that's what Coleman did. Shelled out about \$900 for each of 10 wagons, 16 feet by 4 feet by 6 feet deep. Durn things weigh 7800 pounds empty--36 1/2 tons loaded. And them

wheels! Them back wheels is 7 feet tall, front ones is 5 feet. Each one weighs 1000 pounds--takes me and 4 more good-sized men to change one of 'em. Funny, even though it's 1888 and we've been haulin' borax outta here for almost 5 years--dang near 10,000 tons--not one of them wagons has broke down yet. Wheels do 'cause they take an awful beatin' in the desert, but them wagons was made real good. They'll roll forever. So anyways, I'm meanin' to tell you what my job is like; it ain't all fun. I'm what's called a “long-line skinner” 'cause there's an 80-foot chain runnin' the length of the 165 miles of desert from here to the train depot in Mojave. Bennett's Well is 26 miles south of Harmony, then Mesquite Well, Lone Willow Spring 53 miles later on, Granite Well, Blackwater Well, and 50 miles later is Mojave. Considerin' the team can only travel at most 17 miles a

day, you can see why I gotta carry enough water for everybody. Of course, I don't drive from June to September--too dang hot, but even so it sometimes gets up to 125 out here. Without that water wagon we'd all be parched up like that skinner who died 'cause his head cracked open from the heat. See, I told you it ain't all fun. Well, me and my swamper--he's the one who kinda helps me by cookin', sand-scrubin' the dishes, and pullin' on the hand-brake when we get rollin' downhill a mite too fast--we take off from Harmony when the mornin' star comes up. I hear a lotta skinnners just aswearin' and carryin' on to get their mules goin'; well, if you're good like me you can move 'em out just by callin' their names real quiet-like. Not far south of Harmony we hit some mighty unfriendly territory. I'll tell you right out, I don't envy them Chinese laborers who had to take sledgeham-

mers to beat down them sharp salt spears out there to build me a road. All they got was \$1.25 a day for doin' that. My swamper he gets \$2.00 a day and me, I get \$4.00 a day. See, I said I did my job good--you don't get money like that for bein' a nobody.

Anyways, we get to Bennett's Well on the second day out and refill that iron water wagon (one made outta wood would've dried up and fallen apart in this heat as soon as it got empty).

When we get up to Windy Gap there's some mighty tight corners I gotta maneuver around. Now I'll tell you just how smart my mules is: it's one thing drivin' along a straight road; it's a whole nother thing turnin' corners on a mountain pass. My 2 lead mules, both mares, are about 80 feet ahead of me--so far away I can't even begin to use my 9-foot long whip on 'em. I've been known to throw pebbles at 'em to get their attention. Aim's good too. Back

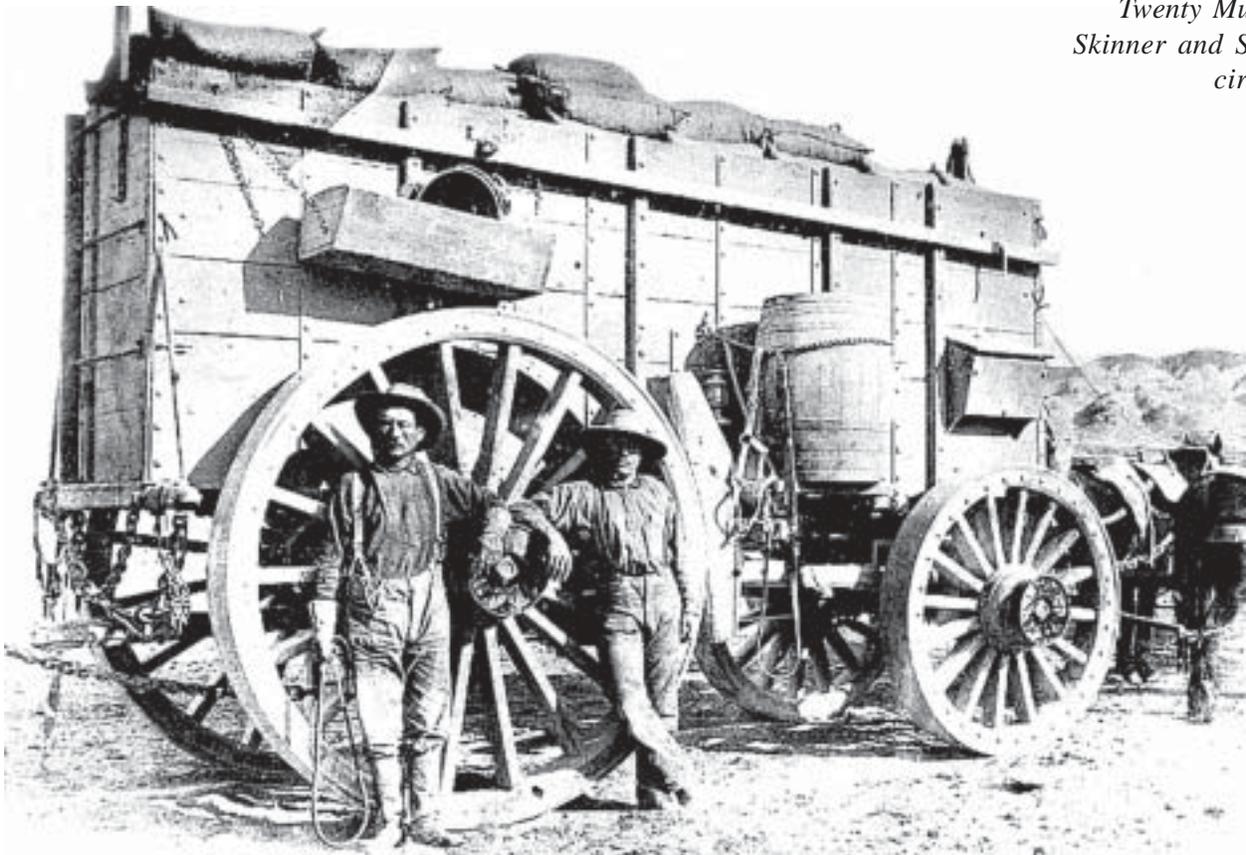
to gettin' around corners. The next 5 pairs of mules are my "swing teams", they ain't real smart, they just know their names and what 'pull' and 'stop' means. Now the next 3 sets of mules behind the swings are my "pointers". These mules are trained special to jump over that 80-foot chain and side-step away from the curve to keep that chain tight and my wagons goin' 'round that corner right. I know most folks can't see in their mind's eye what in blazes I'm talkin' about, so I'll draw it out for you.

Next comes the 2 big horses. They're strong enough to start my wagons rollin', but that's all they're good for. A dumb mule (and I ain't seen one yet) is a whole lot smarter than a smart horse. When the goin' gets rough, I ride on the "nigh wheeler" or way down. Sometimes I meet 'em in the durndest places, and I never did figure out why the empty wagon has the right

of way. Don't make no sense.

Speakin' of no sense--I hear rumors about what a wild bunch us skimmers are, just adrinkin' and agamblin' and who knows what. Well now, ain't that bright. Here I am, in charge of 2 lives, 18 mules that cost a pretty penny, 2 horses, and \$15,000 worth of borax belongin' to Coleman and folks say I'm wild. I doubt ole man Coleman would trust his money to someone who ain't got a lick of sense.

Well, had another pretty fair trip--got into Mojave just about 3 pm on the 10th day. Swamper and me got along okay, mainly 'cause when he looked like he was rarin' up to gab I gave him that "I ain't listenin' to no swamper" look. He knows his place. I know my place too. Right here haulin' borax outta Death Valley. Ain't no other place I want to be, no other job I want to be doin'.



*Twenty Mule Team  
Skinner and Swamper  
circa 1888*



# Lost '49ers



## Death Valley National Park

### The Forty-niners

In 1849, gold was discovered at Sutter's Mill in California and a rush began into the state. It is estimated that 80,000 people came to California

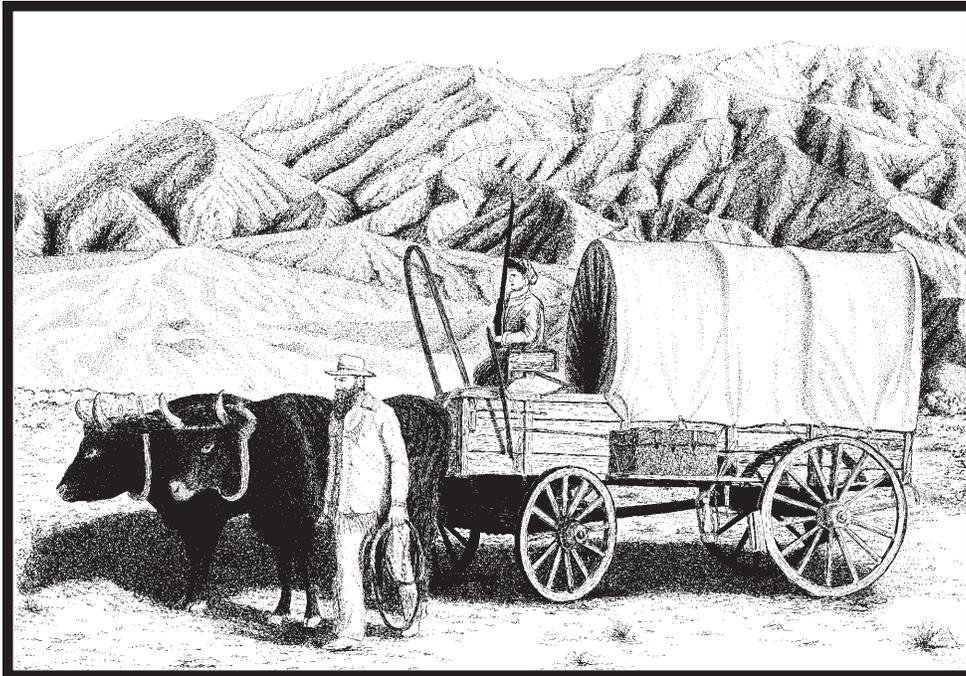
looking for gold in 1850. One such group set out from Salt Lake City, Utah in over 100 wagons under the leadership of Capt. Jefferson Hunt. These families and bands of bachelors came from the South and Midwest. One small group of men came from Germany. As

the party progressed along the trail, dissension mounted when a man produced a shortcut map. Capt. Hunt refused to follow the shortcut because he wasn't familiar with the route. All but seven wagons broke away to follow the map. Most wagons later rejoined Capt. Hunt, but the rest of the party continued on the purported route.

### Across Death Valley

Eventually they realized the map was in error when they found themselves in uncharted territory. Indians watched silently as these strangers traversed their land. The emigrants arrived in December. As they were travelling along, they split up. The young bachelors went one way and discouraged

families from following them thinking they would slow them down. But the Reverend Brier, his wife, Julia and their three children aged eight, six, and four years, insisted on following the



young men. For two months they wandered through Death Valley. At one point they went for 48 hours without anything to drink. Perilously close to starving to death, they had to slay their oxen and leave their wagons behind. By the time they left Death Valley, the Brier's oldest son was the weight of a 3 year old.

### Good-bye, Death Valley

Another lost party, the Bennett, Arcane and Wade families had taken a different route. The Wade family, travelling behind the others, were the only ones to find their way out of Death Valley with their wagons intact.

The Bennett and Arcane families felt they could not go on after suffering terrible hardships. Two young bachelors travelling with them, William Manley and John Rogers, travelled out

of Death Valley on foot and came back with food and supplies to rescue the others. Legend has it that one member of the party turned back and said "good-bye Death Valley". In truth, only one man in the entire group of lost forty-niners perished within Death Valley. However, the ominous name stuck. Reporters began telling gruesome

stories about the place. It was said that beasts conjured up by Satan ruled the area and a poison gas would kill anyone who ventured into the barren terrain.

### The Next Chapter

As gold, silver, borax and other minerals were discovered in Death Valley the stories lost their ability to scare people away. Ironically, almost all of the men who had been lost in Death Valley in 1849 returned to look for the gold and silver potential they had seen here during the nightmare of their ordeal.



# Geology

## Death Valley National Park



Death Valley National Park is a 3.3 million-acre preserve which show-cases the subtle beauty and uniqueness of desert environments. What events conspired to create Death Valley? Why is the landscape

so varied, and so extreme? Badwater Basin contains the lowest point in North America, at 282 feet below sea level, yet it lies in the afternoon shadow of 11,049-foot Telescope Peak.

This rugged topography, as well as sand dunes, craters, and flood-carved canyons, indicate that Death Valley has experienced a lengthy and complex geologic history.

### Ancient Seas

Death Valley's rocks, structure and landforms offer a wealth of information about what the area may have looked like in the past. It is apparent that there has not always been a valley here. Death Valley's oldest rocks, formed at least 1.7 billion years ago, are so severely altered that their history is almost undecipherable. Rocks dating from 500 million years ago, however, paint a clearer picture. The limestones and sandstones found in the Funeral and Panamint Mountains indicate that this area was the site of a warm, shallow sea throughout most of the Paleozoic Era (542 - 251 million years ago.)

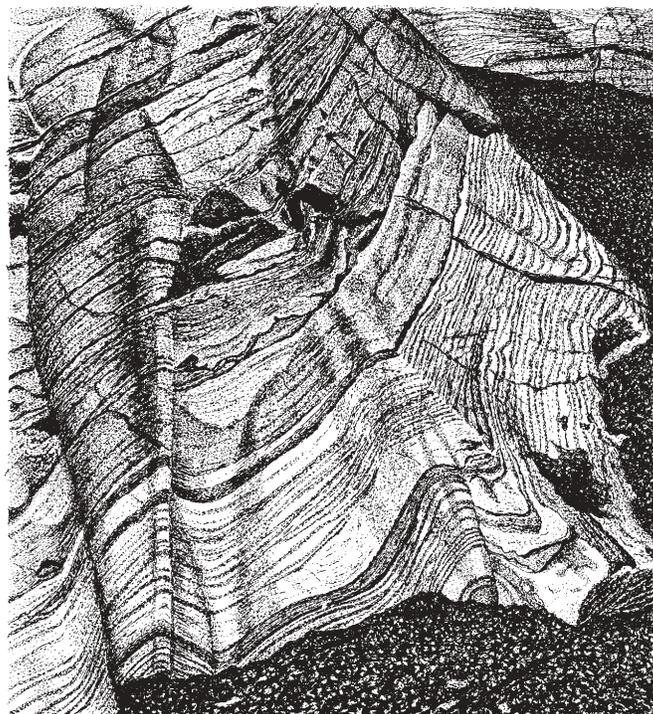
### Warped Mountains

Time passed and the sea began to slowly recede to the west as land was pushed up. This uplift was due to movement occurring far beneath the Earth's surface. Scientists have discovered that the Earth's crust is composed of inter-connected sections, or plates. Death Valley lies near the boundary between two of these plates. As the plates slowly

move in relation to each other, compressional forces gradually fold, warp and fracture the brittle crust. This widespread rock deformation and faulting occurred through most of the Mesozoic Era (251 - 65.5 million years ago.) While the Rocky Mountains and the Sierra Nevada formed, active mountain building alternated with times when erosion prevailed, worked to breaking down the mountains that had formed.

### Traveling Volcanoes

The next phase in Death Valley's development was primarily influenced by volcanic activity that spanned much of the Tertiary Period (65.5 - 2 million years ago.) As fault movement and mountain building stretched the land surface, the crust was weakened. Hot, molten material beneath the surface welled up and erupted at these weak points. The seething volcanoes first appeared to the northeast, in Nevada, and blanketed the Death

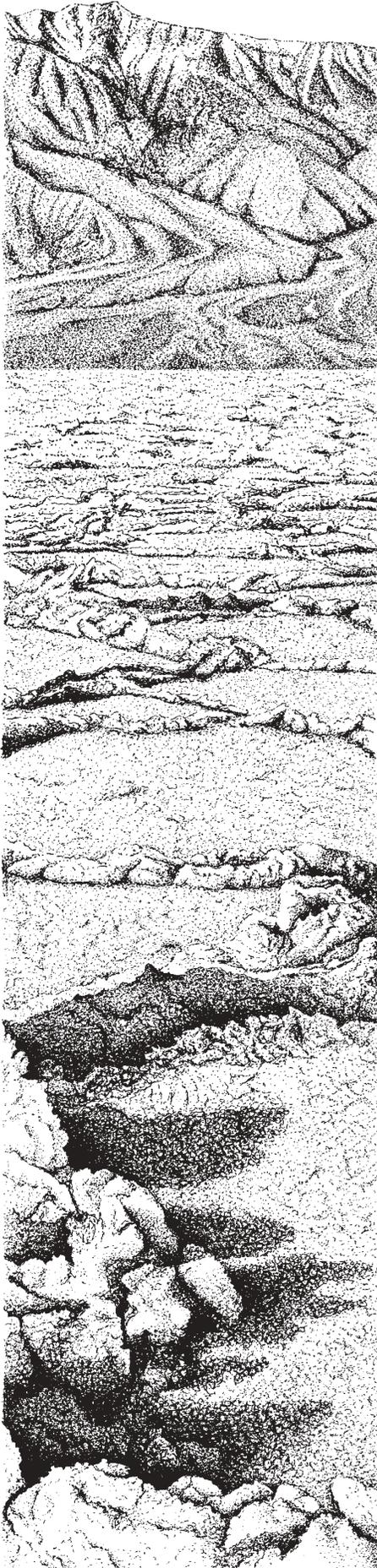


*flood-polished marble in Mosaic Canyon*

Valley region with numerous layers of ash and cinders. The topography then consisted of gently rolling hills, perhaps similar to the present-day Skidoo area. Over time, the center of volcanic activity moved progressively westward, finally producing a chain of volcanoes from Furnace Creek to Shoshone, burying the ancient rocks of the Black Mountains. Secondary results of the ash and cinder eruptions include the vivid colors of the Artist's Palette and Death Valley's famous borate mineral deposits.



*salt-fractured boulder*



*Badwater Basin and Telescope Peak*

### Basin and Range

Approximately three million years ago, the dynamics of crustal movement changed, and Death Valley proper began to form. At that time, compression was replaced by extensional forces. This “pulling apart” of Earth’s crust allowed large blocks of land to slowly slide past one another along faults, forming alternating valleys and mountain ranges. Badwater Basin, the Death Valley salt pan and the Panamint mountain range comprise one block that is rotating eastward as a structural unit. The valley floor has been steadily slipping downward, subsiding along the fault that lies at the base of the Black Mountains. Subsidence continues today. Evidence of this can be seen in the fresh fault scarps exposed near Badwater.

### Erosion and Deposition

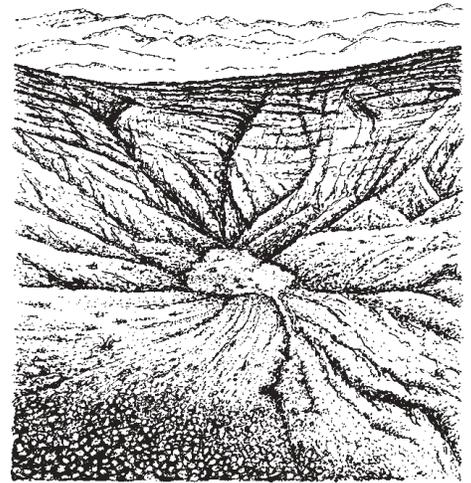
Concurrent with the subsidence has been slow but continuous erosion. Water carries rocks, gravel, sand and silt down from surrounding hills and deposits them on the valley floor. Beneath Badwater lies more than 11,000 feet of accumulated sediment and salts.

### Lost Lakes

In addition to structural changes, Death Valley has been subjected to major climatic changes throughout the past three million years. During North America’s last major Ice Age, the valley was part of a system of large lakes. The lakes disappeared approximately 10,000 years ago, evaporating as the climate warmed. As the lakes evaporated, vast fields of salt deposits were left behind. A smaller, now vanished, lake system occupied the basin floor about 3000 years ago.

### Yesterday's Volcano

Signs of recent volcanic activity exist in northern Death Valley at Ubehebe Crater. Caused by violent steam explosions, the craters formed as recently as 300 years ago when hot, molten material came in contact with groundwater. These large depressions show that Death Valley's geology is dynamic and ever changing .



*Ubehebe Crater*

### Shape of the Future

Death Valley’s landscape has been changing for millions of years. It is changing now, and will continue to change long after we have departed. Erosion slowly carves away at the ancient rock formations, reshaping the surface of the land. The basin continues to subside and the mountains rise ever higher. It is interesting to imagine, but impossible to predict, the future of Death Valley. During your visit here, take time to explore the canyons, salt flats, dune fields and mountains. See if you, too, can unlock secrets of Death Valley’s long and colorful geologic history.



# The Coyote

## Death Valley National Park



Chester worked on many road and trail crews throughout the National Park Service. While hiking on his days off, Chet loved to watch the creatures of the wild. Whether in the badlands of the Dakotas, the mountains of West Virginia, or the great deserts of the southwest, one critter mesmerized this trail worker the most: wily coyote.

Peeking over the yellow blossoms of the creosote bush, Chet watched and waited, just as the coyote watched and waited. Chester and the coyote saw the truck coming up over hill at the same time. Under Chet's scrutiny, the coyote dashed from the cover of the bursage bush and frightened the grazing jackrabbit.

With a thump and a wallop, the truck provided the coyote with a mighty easy meal! Cruel? Wily? Chet had observed this same behavior over and over again, and to him it was just another way in which this amazing animal went about procuring a tasty tidbit.

The tricky coyote portrayed above has been around a long time. Native American tribes not only depict the coyote as trickster, but a sorcerer, creator, fool or charlatan. Today, coyote descriptions include opportunist, scavenger, predator, adapter, and again, *trickster*. Through all these traits, the coyote has learned to survive, where the cougar and wolf could not, and extend their range into 49 states. Here then, are some general characteristics of wily coyote.

**GENUSSPECIES:** *Canis latrans*.

**FAMILY:** Canidae, includes wolf, fox, jackal and domestic dog.

**SIZE:** Males average 35 pounds, 4 feet from nose to tail and 2 feet at the shoulder. Females average 25 pounds. Smaller than wolves which can weigh 100 pounds. Similar to domestic dogs, yet tail is bushier and snout more pointed.

**COLOR:** Brown, golden, gray, mottled.

**RANGE:** Mexico to Alaska, coast to coast.

**TOP SPEED:** 40 miles per hour - faster than roadrunner by 15 miles per hour!

**SENSE:** Number one sense: sight, then smell and hearing. Coyotes evolved across grass plains where they could see rodents, their main meal.

**DIET:** Sixty percent rodents; as an omnivore, coyote will eat insects, seeds, fruits, fish, lizards, birds, carrion (dead animal carcasses), and sick or lame animals as well.

**PETS:** As an opportunist, coyotes take advantage of unattended cats and small dogs. When food sources are low, two or more coyotes have been known to take on a larger dog. All pets on National Park Ser-

vice lands are required to be on a leash not to exceed 6 feet, and cared for at all times.

**PACKS:** Eighty percent live in pack structure of 3 to 7 coyotes. They display a complicated social structure with dominant and subservient behavior.

**LOVELIFE:** Mate in January/February. Partners for life. Gestation two months. Litters 2-12 pups depending on the amount of food available in their territory. **Avoid coyote burrows from April through mid-summer.** Coyotes will be aggressive to humans or large dogs in an attempt to protect pups.

**COYOTE AND MAN:** Since 1825, humans have tried to eliminate this natural predator with traps, poisoned meat, helicopters and twisted barbed wire, to list a few of the methods. Hundreds of thousands of coyotes have died. Yet, in the face of destruction, coyotes have countered with behavior changes. As more fellow coyotes die, more females breed and they produce larger litters!

**PREDATORS:** Wolves are the natural predator of the coyote. Mountain lions have been known to munch a coyote. Roadways cause fatalities. Human activity.

Coyotes have people all figured out! They have learned to avoid traps and poisoned meat, and to come to visitors for a hand-out. Park regulations forbid the feeding of wild animals. Cheetos, watermelon and beer will disrupt the digestive system of this hunter! Once they become accustomed to people food, they become *beggar* coyotes. The animal may become more aggressive in an attempt to get your food. At this point, the coyote may have to be

destroyed. **Don't be responsible for the death of a coyote.** Left to their natural diet of rodents, the coyote plays an important role in nature.

What you can do is marvel at the antics, the howling and the adaptive ways of the coyote, just as Chester did one day at Yellowstone Lake in Wyoming. During a lunch break, Chet noticed two coyotes hiding in the woods while pelicans splashed in the nearby water. He marveled as one coyote lifted its tail and slowly wagged it back and forth. Then the coyote came out of the woods, played with sticks, ignored the pelicans and walked away. Baffled and awed, Chet watched as the curious pelicans approached the woods where the tail had wagged. When they reached the edge of the woods, the hidden coyote burst forth and grabbed one pelican. Trickster then trotted off in the direction of its cohort. Cruel? Nope. That's down right wily!





# Common Desert Plants



## Death Valley National Park

The low desert of Death Valley is a harsh place for plants to survive. The combination of high summer temperatures, an average annual

rainfall of less than 2 inches, and concentrations of salts in the soil all account for the sparse vegetation found here. These

plants have been successful at enduring the hardships and are the most common in the low elevations of Death Valley National Park.



### Honey Mesquite

*Prosopis glandulosa torreyana*

Small native tree of watered areas.

**leaves:** divided and fern-like; deciduous

**branches:** knobby with long spines

**fruit:** straw-colored, edible bean pod



### Desert Trumpet

*Eriogonum inflatum*

Odd plant 1 to 3 feet tall of roadsides and washes.

**leaves:** silver-green; at base of plant

**stems:** flower stalks have hollow bulge just below branches

**flowers:** yellow and tiny



### Sprucebush

*Peucephyllum schottii*

Dark green shrub of washes or canyons.

**leaves:** needle shaped leaves resemble conifer; pine scented

**flowers:** yellow clusters

**branches:** twisted "trunk" like a juniper



### Desert Holly

*Atriplex hymenelytra*

Stout shrub of alluvial fans, foothills, and washes.

**leaves:** whitish, smooth leaves are holly-shaped; turns pink in summer when dormant

**flower:** pink bud clusters are berry-like



### Creosotebush

*Larrea tridentata*

Delicate-looking yet hardy shrub with strong odor of creosote.

**leaves:** olive-green, tiny and "cleft" into 2 segments

**flowers:** yellow with 5 petals

**stems:** thin and flexible with dark bands



## Rocknettle

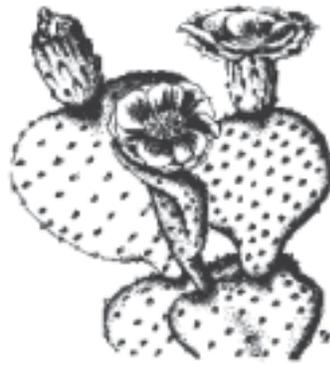
*Eucnide urens*

Bristly, broad-leaved shrub of canyons and washes.

**leaves:** large for a desert plant; bright green color almost hidden by stiff bristles

**flowers:** pale yellow and showy

**warning:** avoid touching this plant, the bristles will cling to clothing and are irritating to the skin



## Beavertail Cactus

*Opuntia basilaris*

A low growing pricklypear cactus lacking long spines.

**stems:** flat gray-green pads dotted with bunches of tiny spines

**flowers:** magenta and showy

**warning:** although this cactus appears spine-free, do not touch; the small, barbed spines are very irritating to the skin



## Arrowweed

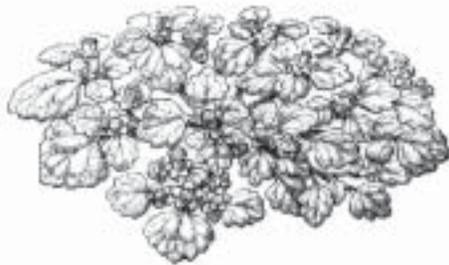
*Pulchea sericea*

These water-loving shrubs form the "corn shocks" of the Devil's Cornfield.

**leaves:** gray-green; narrow and pointed

**stems:** long and straight like arrow shafts; grow in thick clumps

**flowers:** pink clusters



## Turtleback

*Psathyrotes ramosissima*

Low, compact plant of dry washes.

**leaves:** gray, wrinkled, and furry; very aromatic.

**flowers:** yellow clusters at any season



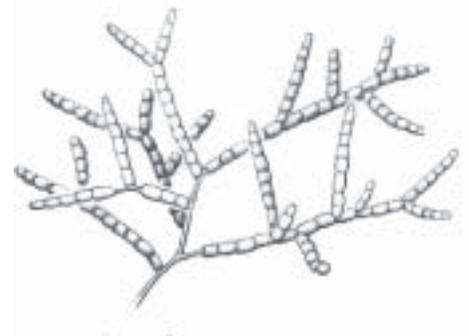
## Honeysweet

*Tidestromia oblongifolia*

Rounded, low shrub, often found with desert holly.

**leaves:** gray-green, tiny and covered with fuzz; turns pink, then tan, in winter when dormant

**stems:** abundant, pink tinged branches make plant compact and rounded



## Pickleweed

*Allenrolfea occidentalis*

Succulent shrub of salty springs. Our most salt tolerant plant.

**stems:** fleshy and green; numerous joints like pearls on a string



# Desert Wildlife



## Death Valley National Park



bighorn sheep

Shy and elusive, bighorn sheep are the park's largest native animal. Watch for them in canyons and on mountain slopes.



kit fox

Kit fox are the size of a housecat and have large ears and tail. They are nocturnal and are most common in lower elevations.



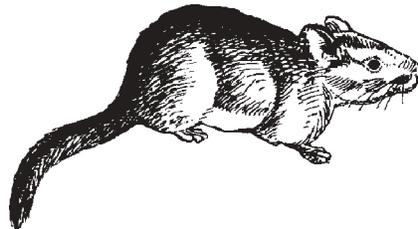
coyote

Common throughout the park. Coyotes are excellent scavengers and hunters; they do not need your handouts. **Do not feed coyotes or other wildlife!**



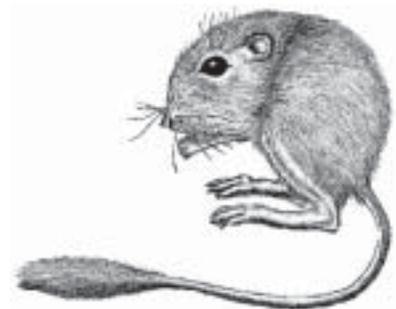
antelope ground squirrel

These tiny, pale squirrels are common in the desert shrublands. White tail is held over its back to reflect sunlight.



desert woodrat

Also known as pack rats, these nocturnal rodents love to collect things and pile them in their middens.



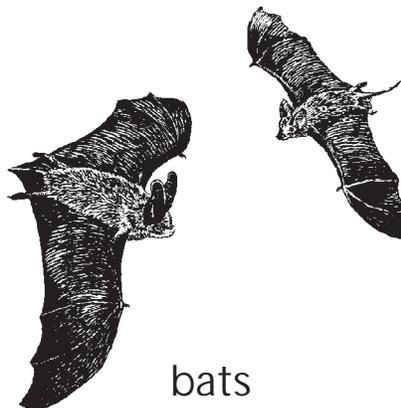
kangaroo rat

Nocturnal kangaroo rats are found in dry areas on the valley floor, especially near mesquite.



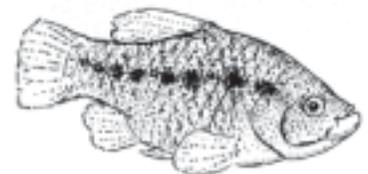
black-tailed jackrabbit

Jackrabbits are most common in the mid-elevations around the park. Watch for them on moon-lit nights.



bats

Bats are usually seen at dusk. The most common species found in the park are the California myotis and the western pipistrelle.



pupfish

Tiny native pupfish are found in only a few isolated springs and creeks. Four species live in the park; the Devil's Hole pupfish is an endangered species.



roadrunner

These ground-dwelling desert birds are found in the lower elevations of Death Valley. They eat lizards, insects, snakes, and small birds.



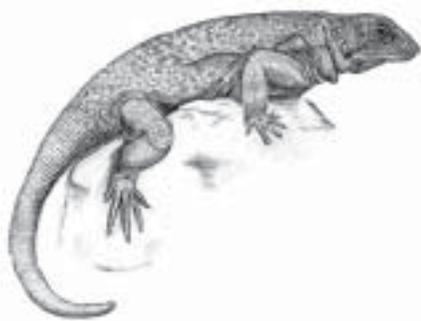
great-tailed grackle

These sleek birds are often found in noisy flocks near developed areas. Males are glossy-black with long tails; the brown females have shorter tails.



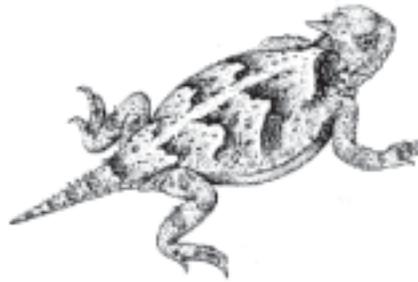
raven

Ravens are common throughout the park and are often found in pairs. These clever birds eat a great variety of food.



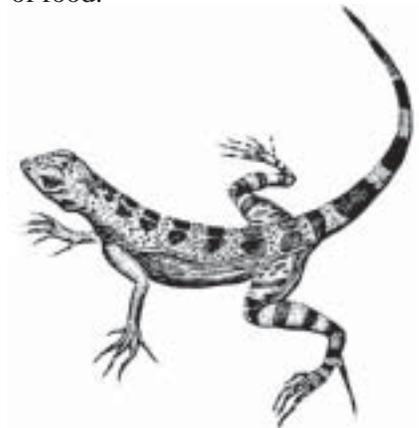
chuckwalla

Chuckwallas are the largest lizard in the park. Found near rocks, it will squeeze into a rock crevice and inflate itself when threatened.



horned lizard

Well camouflaged, these lizards are often found near ants, their primary food source. Watch for them crossing dirt roads in the park's mid-elevations.



zebra-tailed lizard

These pale lizards are common in the lower elevations of the valley. They lift their black and white striped tails high when running.



sidewinder

These rattlesnakes are found mainly in the lower elevations. Though venomous, sidewinders are not aggressive when left undisturbed.



scorpion

Scorpions are nocturnal and hide under rocks from the desert sun. All scorpions have a venomous sting, but those found in the park are not deadly.



tarantula

These harmless, ground-dwelling spiders are most often seen crossings roads in autumn. Look for them in the higher desert valleys.



# Mammals



## Death Valley National Park

Death Valley National Park protects over 3 million acres of Mojave Desert famous as the hottest, driest and lowest place in the nation. Despite those extremes, it is

home to a diverse amount of wildlife species: 56 mammals, 36 reptiles, 5 amphibians, 6 fish, and nearly 400 bird species have been found in the park.

This list represents observation and studies reported primarily since 1933.

### Shrews

#### Desert Shrew

*Notiosorex crawfordi*

Found in sagebrush; sometimes in masses of vegetation at the base of desert plants.

### Bats

#### Fringed Myotis

*Myotis thysanodes*

Found in upper creosote bush desert to subalpine conifer forest.

#### California Myotis

*Myotis californicus*

One of the most common bats at lower elevations; forages within 15 feet from ground in early evening.

#### Small-footed Myotis

*Myotis leibii*

Forages in early evening; frequently drinks after emerging; feeds low over brush; roosts in caves.

#### Long-legged Myotis

*Myotis volans*

Most often found in conifer forests; rapid, direct flier; hunts at tree-tops.

#### Yuma Myotis

*Myotis yumanensis*

Forages just after sunset over water.

#### Silver-haired Bat

*Lasionycteris noctivagans*

Found around water in forested areas; flies slow with frequent short glides.

#### Western Pipistrelle

*Pipistrellus hesperus*

Most commonly seen bat in park; forages before sunset to after sunrise; slow, fluttery flight; in rocky canyons.

#### Townsend's Big-eared Bat

*Corynorhinus townsendii*

All elevations; roosts in abandoned mines; most disturbance-sensitive bat species in western U.S.

### Red Bat

*Lasiurus blossevillii*

Leaves roost at deep dusk; usually feed in pairs; flight steady and rapid; wooded areas.

### Hoary Bat

*Lasiurus cinereus*

Largest bat in park; found in wooded areas; swift, direct flight; emerges late in evening, occasionally on warm winter afternoons.

### Spotted Bat

*Euderma maculatum*

Rarely seen, but has distinctive auditory echolocation call.

### Pallid Bat

*Antrozous pallidus*

Late flier; forages near ground, often lands to pick up scorpions and other insects; slow wing-beats.

### Mexican Free-tailed Bat

*Tadarida brasiliensis*

Flies high and fast; often roosts in large colonies.

### Big Free-tailed Bat

*Nyctinomops macrotis*

Leaves roost late dusk; rare in U.S.

### Ringtail Family

#### Ringtail

*Bassariscus astutus*

Nocturnal and secretive; rocky terrain in arid brush and wooded areas.

### Weasel Family

#### Badger

*Taxidea taxus*

Mostly nocturnal, but often active in early morning; low desert into mountains; digs burrows

#### Spotted Skunk

*Spilogale putorius*

Nocturnal; found in brushy areas and among boulders in mountains.

### Canines

#### Coyote

*Canis latrans*

Common throughout park; often heard calling at night or begging along roadsides (do not feed wild animals!)

#### Kit Fox

*Vulpes macrotis*

Nocturnal; in day stays in burrow; prefers open, level, sandy ground in low desert; often curious

#### Gray Fox

*Urocyon cinereoargenteus*

Mostly nocturnal; uncommon in park.

### Cats

#### Mountain Lion

*Puma concolor*

Mostly nocturnal and secretive; found primarily where there are deer, their main prey; surrounding mountains.

#### Bobcat

*Lynx rufus*

Mostly nocturnal; common in park but secretive and rarely seen.



Coyote

## Rodents

### Panamint Chipmunk

*Tamias panamintinus*

Colorful squirrel; piñon-juniper woodlands of Panamint and Grapevine Mountains; active nearly year-round.

### White-tailed Antelope Squirrel

*Ammospermophilus leucurus*

Most common squirrel in park; from valley floor to over 6000 feet; adapted to hot weather, non-hibernating.

### California Ground Squirrel

*Spermophilus beecheyi*

Solitary or in small colonies; Hunter Mountain area of Cottonwood Mountains.

### Round-tailed Ground Squirrel

*Spermophilus tereticaudus*

Common in low desert, mesquite thickets; may climb into bushes to escape heat; non-hibernating

### Mojave Ground Squirrel

*Spermophilus mohavensis*

Endemic to Mojave Desert; low to mid-elevations; mainly solitary; burrow lacks mound of excavated dirt; hibernates more than half of year. A threatened species in California.

### Botta's Pocket Gopher

*Thomomys bottae*

Pocket gophers rarely above ground for long; mainly nocturnal on surface; active year-round; below 5000 feet.

### Pygmy Pocket Gopher

*Thomomys umbrinus oreocus*

Leave fan-shaped mounds of dirt; higher elevations up to 10,000 feet on surrounding mountains.

### Panamint Pocket Gopher

*Thomomys umbrinus scapterus*

Panamint and Grapevine Mountains.

### Great Basin Pocket Mouse

*Perognathus parvus*

Nocturnal; inactive in winter; piñon-juniper woodlands.

### Little Pocket Mouse

*Perognathus longimembris*

Nocturnal; likes areas of desert pavement; creosote bush to sagebrush

### Long-tailed Pocket Mouse

*Chaetodipus formosus mohavensis*

Nocturnal; rocky slopes and canyons; Grapevine Mountains

### Desert Pocket Mouse

*Chaetodipus penicillatus*

Nocturnal; open, sandy valley floor.

### Chisel-toothed Kangaroo Rat

*Dipodomys microps*

Nocturnal; mid-elevation desert to sagebrush; sandy soil or rocky slopes with sparse vegetation.

### Panamint Kangaroo Rat

*Dipodomys panamintinus*

Nocturnal; mountains 6000 to 7000 feet; piñon-juniper to sagebrush.

### Merriam's Kangaroo Rat

*Dipodomys merriami*

Nocturnal; smallest of the kangaroo rats; sandy soil on the valley floor.

### Desert Kangaroo Rat

*Dipodomys deserti*

Nocturnal; largest kangaroo rat in park; white tip on tail; valley floor, especially around mesquite.

### Western Harvest Mouse

*Reithrodontomys megalotis*

Dense vegetation near water; Salt Creek, Furnace Creek, Wildrose.

### Cactus Mouse

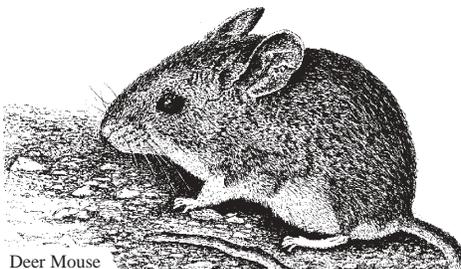
*Peromyscus eremicus*

Nocturnal; low desert to mountains; rocky outcrops.

### Canyon Mouse

*Peromyscus crinitus*

Nocturnal; rocky areas in canyons and mountains.



Deer Mouse

### Deer Mouse

*Peromyscus maniculatis*

Nocturnal; common throughout park

### Brush Mouse

*Peromyscus boylii*

Nocturnal; good climber; brushy areas in mountains.

### Piñon Mouse

*Peromyscus truei*

Nocturnal; rocky areas in piñon-juniper woodlands.

### Southern Grasshopper Mouse

*Onychomys torridus*

Throughout park below 5500 feet; carnivorous; call a shrill whistle.

### Desert Woodrat

*Neotoma lepida*

Nocturnal; common throughout park; build large "houses" of debris on ground or along cliffs.

### Bushy-tailed Woodrat

*Neotoma cinerea*

Nocturnal; piñon-juniper; gather debris in rock crevices or under logs.

### House Mouse

*Mus musculus*

In and around human dwellings.

### Porcupine

*Erethizon dorsatum*

Mostly nocturnal; among trees in Mountains.

## Rabbits & Hares

### Mountain Cottontail

*Sylvilagus nuttalli*

Sagebrush to woodlands in surrounding mountains.

### Desert Cottontail

*Sylvilagus audobonii*

Mesquite thickets on valley floor; watered areas; most active late afternoon through the night.

### Black-tailed Jackrabbit

*Lepus californicus*

Valley floor to mountains; most active early evening through early morning.

## Hoofed Mammals

### Mule Deer

*Odocoileus hemionus*

In Panamint, Cottonwood and Grapevine Mountains; Hunter Mountain area.

### Desert Bighorn Sheep

*Ovis canadensis nelsoni*

Surrounding mountains, especially inaccessible ridges and canyons, usually near water.

### Burro

*Equus assinus*

Introduced in 1880s; mountains and high desert; active removal program by NPS.

### Horse

*Equus caballus*

Introduced; active removal program by NPS.



# Reptiles, Amphibians, & Fish



## Death Valley National Park

Death Valley National Park protects over 3 million acres of Mojave Desert, famous as the hottest, driest and lowest place in the nation. Despite those extremes, it is home to a diverse amount of wildlife species: 56 mammals, 36 reptiles, 5 amphibians, 6 fish, and nearly 400 bird species have been found in the park.

Habitats vary from salt pan below sea level to the subalpine conditions found on the 11,049' summit of Telescope Peak. In between are sand dunes, canyons, alluvial fans, badlands, rocky ridges, and spring-fed wetlands. Vegetation zones include creosote bush, desert holly and mesquite at the lower elevations and range up

through shadscale, blackbrush, Joshua tree, piñon-juniper woodlands, to limber pine and bristlecone pine. Annual precipitation varies from 1.9 inches on the valley floor to over 15 inches in the surrounding mountains. This list represents observation and studies reported primarily since 1933.

### Reptiles

#### Desert Tortoise

*Gopherus agassizii*

Found in flats and surrounding foothills from 1500 to 3500 feet; burrows have arched roof; a federally listed threatened species.

#### Desert Banded Gecko

*Coleonyx variegatus variegatus*

Nocturnal; rocky areas, creosote bush flats; valley floor to 3500 feet.

#### Desert Iguana

*Dipsosaurus dorsalis*

In hummocks of mesquite and creosote bush in areas of fine, sandy soil; up to 3000 feet; very heat tolerant.

#### Chuckwalla

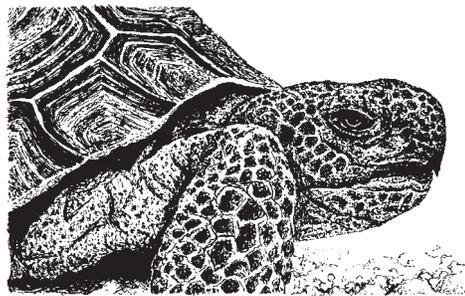
*Sauromalus ater*

Areas of rocks and boulders on alluvial fans and in canyons; throughout Death Valley up to 5000 ft.

#### Zebra-tailed Lizard

*Callisaurus draconoides*

Open areas in desert; near dunes and washes; on roads in morning; runs at great speed with tail curled forward.



Desert Tortoise

#### Mojave Fringe-toed Lizard

*Uma scoparia*

Ibex Dunes; may dive into loose sand when frightened.

#### Collared Lizard

*Crotaphytus collaris*

Areas of boulders for basking and open areas for hunting; from 1000 to 5000 feet.

#### Leopard Lizard

*Gambelia wislizenii*

Valley floor to 3600 feet on alluvial fans, in canyons and washes with scattered vegetation.

#### Desert Spiny Lizard

*Sceloporus magister magister*

Rocky slopes and canyons around vegetation from 3500 to 7000 feet; a good climber

#### Great Basin Fence Lizard

*Sceloporus occidentalis biseriatus*

Rocky areas in most elevations except low desert; rock outcrops, canyons, near springs.

#### Sagebrush Lizard

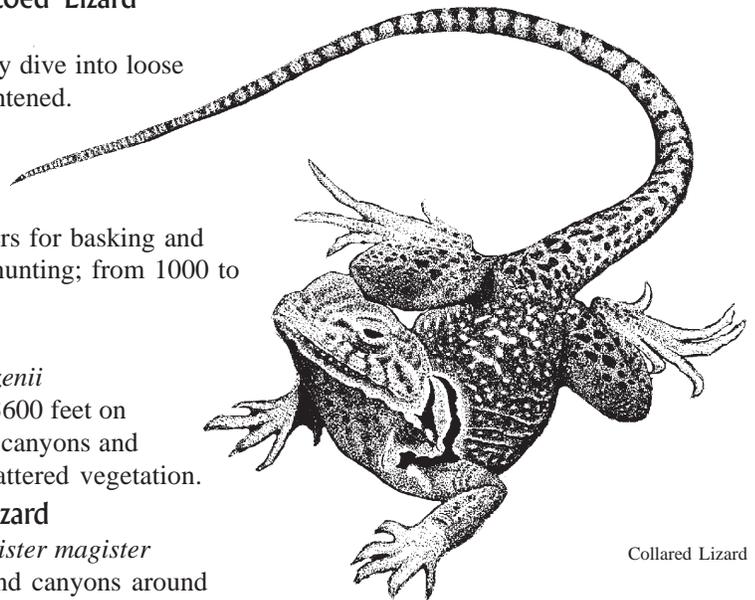
*Sceloporus graciosus*

Sagebrush through pinyon-juniper woodlands to 10,500 feet.

#### Side-blotched Lizard

*Uta stansburiana*

Most commonly seen lizard in park; throughout park below 5000 feet in gravelly areas; active on warm days all year.



Collared Lizard

#### Western Brush Lizard

*Urosaurus graciosus graciosus*

Low desert in and around creosote bush and mesquite; lies camouflaged on branch or exposed roots.

#### Southern Desert Horned Lizard

*Phrynosoma platyrhinos calidiarum*

Sandy, gravelly areas; low desert to over 5000 feet; often near ant nests.

#### Desert Night Lizard

*Xantusia vigilis vigilis*

Under debris of yuccas; sagebrush zone of Panamint Mountains; most active in daytime but secretive and rarely seen.

## Western Skink

*Eumeces skiltonianus skiltonianus*

Moist areas with good cover in pinyon-juniper woodlands.

## Western Red-tailed Skink

*Eumeces gilberti rubricaudatus*

Isolated populations in Hanaupah and Johnson Canyons.

## Great Basin Whiptail Lizard

*Cnemidophorus tigris tigris*

Sandy areas with sparse vegetation; rocky areas of upper washes; from below sea level to 5000 feet.

## Panamint Alligator Lizard

*Elegaria panamintina*

Panamint and Grapevine Mountains above 3500 feet; talus slopes; thickets of wild grapevines near watered areas.

## Western Blind Snake

*Lepotyphlops humilis*

Nocturnal; under rocks, among roots on brush covered slopes; from below sea level to 4000 feet.

## Rosy Boa

*Lichanura trivigata*

Mostly nocturnal; low foothills and canyons below 4500 feet; watered areas.

## Western Leaf-nosed Snake

*Phyllorhynchus decurtatus perkinsi*

Nocturnal; sandy and gravelly soil among creosote bush; rocky foothills.

## Western Coachwhip (Red Racer)

*Masticophis flagellum piceus*

Common throughout park; often seen crossing roads; very fast and heat-tolerant; an aggressive snake, will bite if disturbed.

## Striped Whipsnake

*Masticophis taeniatus*

Near water in Black Mountains and Cottonwood Mountains.

## Desert Patch-nosed Snake

*Salvadora hexalepis hexalepis*

Rocky and sandy areas from lower slopes and washes up to 6000 feet.

## Desert Glossy Snake

*Arizona elegans eburnata*

Nocturnal; sandy or gravelly areas at low elevations.

## Great Basin Gopher Snake

*Pituophis catenifer deserticola*

From rock-strewn desert foothills into mountains; good climber.

## California Kingsnake

*Lampropeltis getula californiae*

Panamint and Grapevine Mountains; nocturnal in hot weather.

## Western Long-nosed Snake

*Rhinocheilus lecontei lecontei*

Nocturnal; mid-elevations of park.

## Western Ground Snake

*Sonora semiannulata*

Nocturnal and secretive; sandy or fine gravel to over 4000 feet

## Mojave Shovel-nosed Snake

*Chionactis occipitalis occipitalis*

Nocturnal; sandy areas of the low desert; sage flats.

## Southwestern Black-headed Snake

*Tantilla hobartsmithi*

Nocturnal; Panamint Mountains.

## California Lyre Snake

*Trimorphodon biscatatus vandenburghi*

Nocturnal; rocky areas; sea level to over 4000 ft.

## Desert Night Snake

*Hysiglena torquata*

Nocturnal; many habitats from below sea level to over 5000 feet.

## Panamint Rattlesnake

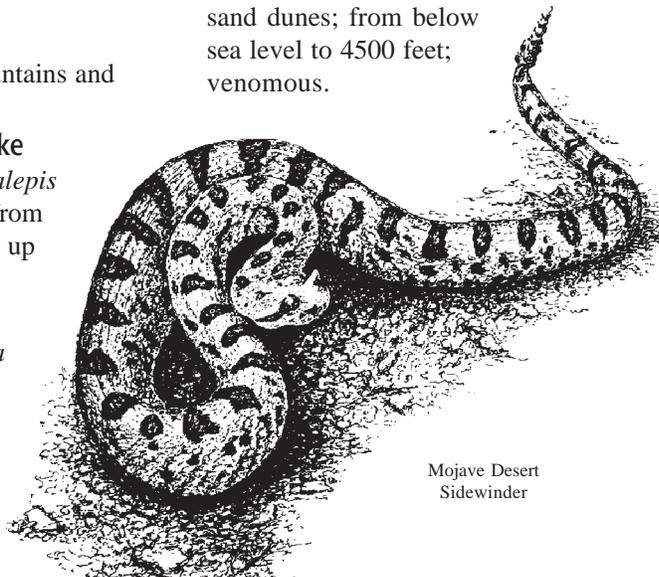
*Crotalus michelli stephensi*

Rocky areas in foothills and mountains; venomous.

## Mojave Desert Sidewinder

*Crotalus cerastes cerastes*

Nocturnal and common; mesquite hummocks and sand dunes; from below sea level to 4500 feet; venomous.



Mojave Desert Sidewinder

## Amphibians

### Inyo Mountains Slender Salamander

*Batrachoseps campi*

Rare; found in riparian areas in the Panamint Mountains.

### Red-spotted Toad

*Bufo punctatus*

Mainly nocturnal; common in rocky areas near water.

### Western Toad

*Bufo boreas*

Introduced to the Furnace Creek area where it is locally abundant; mainly nocturnal.

### Pacific Treefrog

*Pseudacris regilla*

Watered areas throughout park.

### Bullfrog

*Rana catesbeiana*

Introduced to the Furnace Creek area around 1920; highly aquatic.

## Fish

### Amargosa Pupfish

*Cyprinodon nevadensis amargosa*

Found in the Amargosa River northwest of Saratoga Springs.

### Saratoga Pupfish

*Cyprinodon nevadensis nevadensis*

Endemic to Saratoga Springs at the south end of Death Valley.

### Devil's Hole Pupfish

*Cyprinodon diabolis*

Endemic to Devil's Hole in the Ash Meadows Spring Complex; A federally listed endangered species.

### Salt Creek Pupfish

*Cyprinodon salinus salinus*

Endemic to Salt Creek in central Death Valley. Most active during spring mating season.

### Cottonball Marsh Pupfish

*Cyprinodon salinus milleri*

Endemic to Cottonball Marsh on the western side of central Death Valley; An threatened species in California.

### Western Mosquitofish

*Gambusia affinis*

Introduced into the Furnace Creek irrigation ditches and ponds.