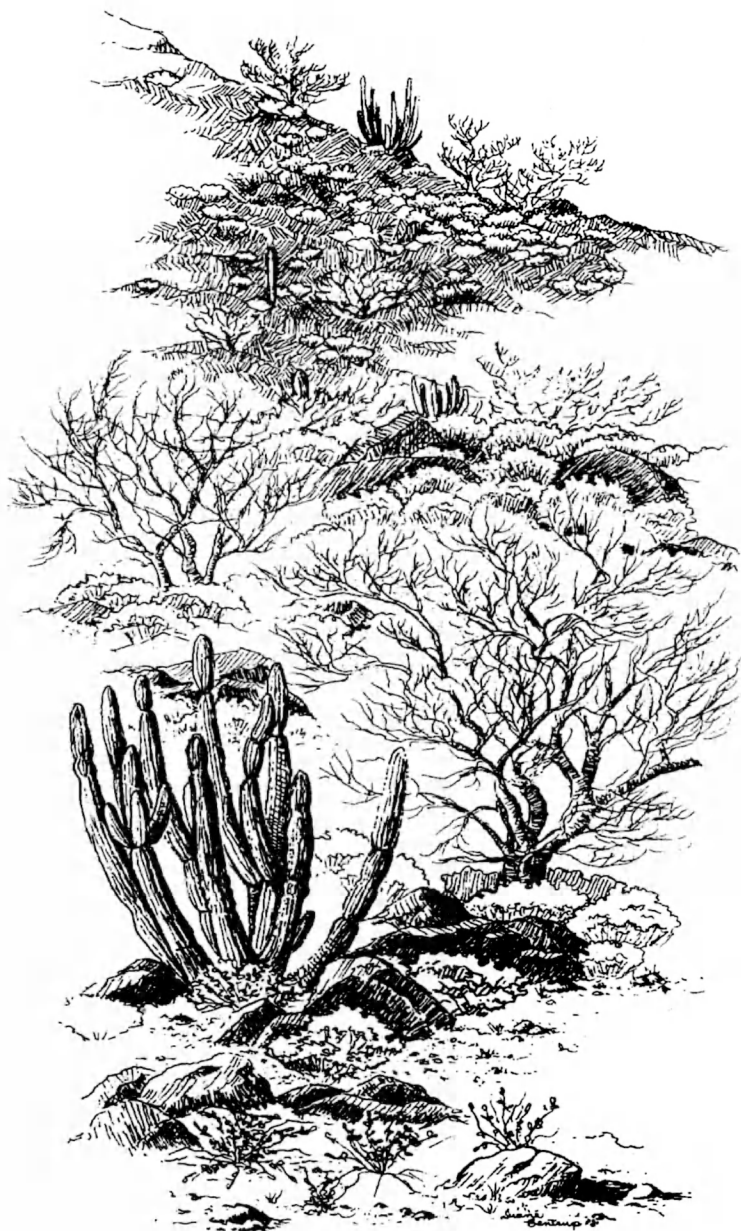
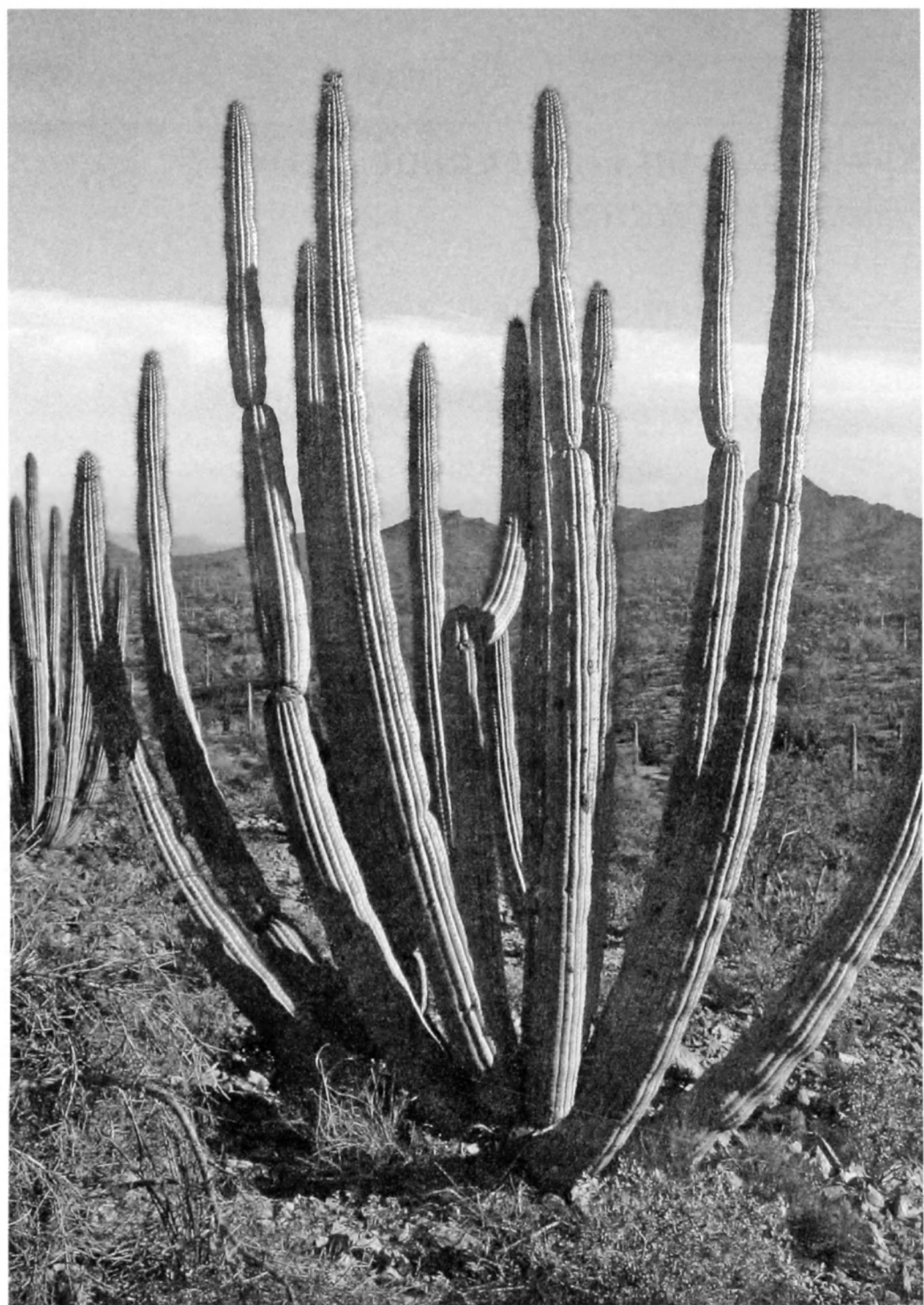




Ajo Mountain Drive Guide

Desert Adaptations





How to Use This Guide

This guide is intended to help you enjoy Organ Pipe Cactus National Monument by better understanding the Sonoran Desert. Keep notes on any questions that come to mind and when you return to the Kris Eggle Visitor Center, ask a ranger.

The Ajo Mountain Drive is a 21-mile (34 km) graded, one-way dirt road. It winds and dips over a route that blends with the primitive nature of the landscape. The drive will take approximately 2 hours.

Driving slowly and taking advantage of the stops will provide the best opportunities to enjoy the desert. The road has been designed so that a passenger car, driven with caution, may be taken over it safely. This route provides access to some of the finest scenery in the monument.

Each numbered stake with the organ pipe cactus image beside the road corresponds to the numbered paragraph in the guide. Each stop in the guide indicates the distance from the fee station at stop #1.

There are four picnic sites provided along the drive. Stops #6 has a ramada to provide a shaded picnic site and Estes Canyon after stop #11 has a ramada and restrooms.



**Look for this
road sign**

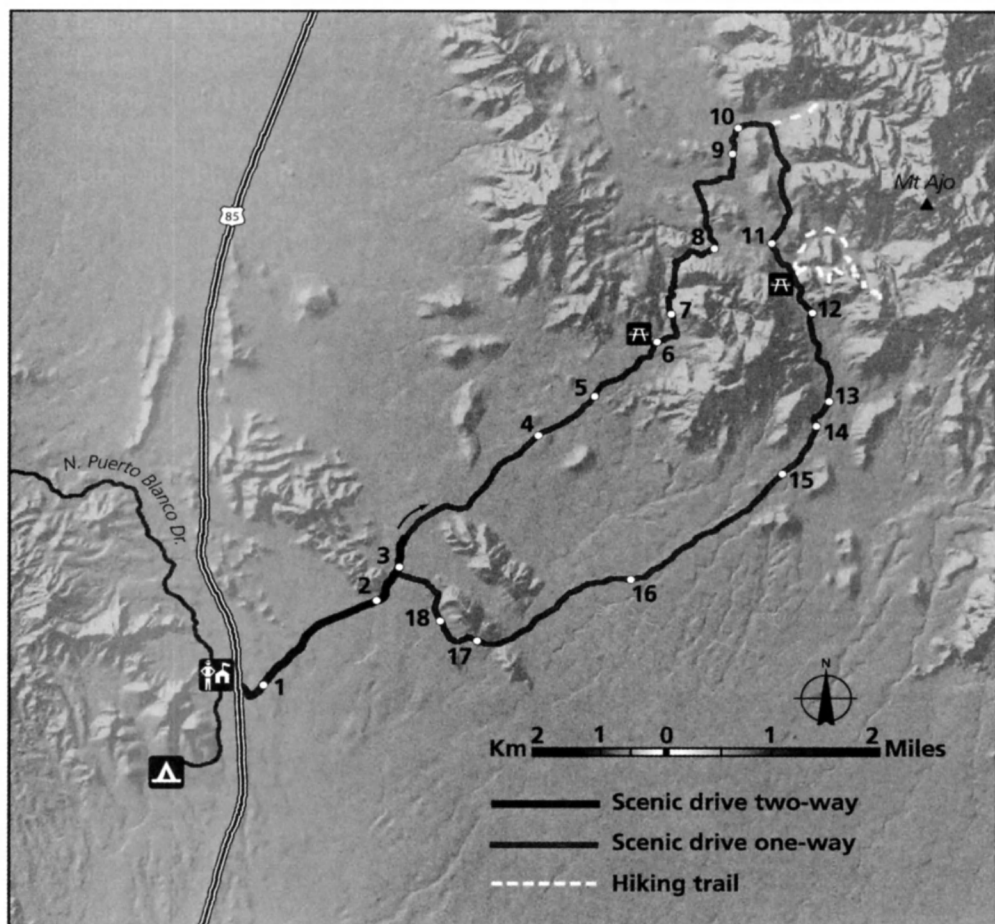
Some Reminders

- Trailers, buses and RVs over 25 ft (8 m) are prohibited on Ajo Mountain Drive
- Fires are not permitted.
- Water is not available anywhere along the drive so carry plenty with you.
- Camping is not allowed on the drive.
- Pets are not allowed on trails or in the backcountry. They must be leashed at all times. Please do not leave pets unattended.
- Do not cross flooded washes.
- Do not pick up hitchhikers.
- Report any suspicious activity to park staff immediately. Do not contact any suspicious persons. If you see them in distress, contact a ranger for help.

Leave No Trace

- Be considerate of other visitors.
- Respect wildlife.
- Leave what you find.
- Dispose of waste properly.
- Plan ahead and prepare.





Sonoran Lingo - Speak Like a Local

Saguaro – sa-WAH-row
 Creosote – CREE-oh-sote
 Cholla – CHOY-yah
 Ajo – AH-hoe
 Palo verde – PA-loh VAIR-deh
 Bajada – bah-HAH-da
 Estes – ESS-tees
 Jojoba – hoe-HOE-bah
 Mesquite – mess-KEET
 Pinacate – PEE-nah-CAH-teh

Ocotillo – Oh-koh-TEE-yo
 Diaz – DEE-ahz
 Tohono – Tow-HOE-no
 O’Odham – Oh-oh-thaam
 Gila – HEE-lah
 Mojave – Moe-HAH-vee
 Chihuahua – Chee-WAH-wah
 Tinaja – tee-NA-hah
 Cubabi – cu-BAH-bee

The Sonoran Desert

Welcome to Organ Pipe Cactus National Monument, the heart of the Sonoran Desert. This desert covers 120,000 square miles (260,000 sq km), an area about the size of the state of New Mexico. The Sonoran Desert is the most diverse desert in North America, home to over 4,000 species of plants and animals. Why is this place so diverse? What makes this desert different from the Great Basin Desert to our north, Mojave to our west or the Chihuahuan to our east? Many factors make the Sonoran Desert unique. Our winters are mostly frost-free, and there are two rainfall periods, one in the winter/spring and another in July and August. The high mountain ranges affect how much rain falls in an area, creating a diversity of habitats for specially adapted plants and animals to thrive. Everything seems to be related or connected to something else in complex ways.

Based on plant evidence, scientists believe this is a young desert, only about 10,000 years old, with its ancestry in the tropics. Many of our perennial plants (cacti and other succulents) and animals (such as lizards and snakes) migrated from the tropics or are descendants of tropical species. They prosper in the brief summer storms that occur here. Annual plants, like many wildflowers, rely on the soaking winter rains that help make the Sonoran Desert so diverse. Many plants and animals in the Sonoran Desert have adapted to reproduce or grow after sufficient rainfall



in winter or summer. Most animals that live here are either nocturnal or crepuscular (dusk- or dawn-active) to thwart the high daytime temperatures. These adaptations, along with many more, allow the Sonoran Desert life to thrive.

Welcome to the Green Desert! As you travel down this road, we encourage you to travel slowly, pay attention to details, and discover some of these unique relationships for yourself.



Stop 2

Mile 1.4 [km 2.3]

The Desert Smells Like Rain

Decorating the landscape of the Sonoran Desert is the creosote bush. This olive green shrub you see all around you is one of the most drought-tolerant plants in North America. Long after the soil is too dry for most species, creosote still manages to absorb water. Its adaptations allow it to survive without water for two years before completely dying.

This supple plant sports small yellow blossoms in the spring and summer. It may occasionally bloom during other times of the year if rainfall is sufficient. The seeds are gray fuzzy balls that resemble droplets of water hanging from the branches. The waxy coating on creosote's leaves protects the plant from excessive water loss. Locals often say that the Sonoran Desert "smells like rain" because of the intoxicating aroma the leaves give off during a rain storm or on a foggy winter morning.

Creosote is found abundantly, all over the southwest, in three deserts — the

Chihuahuan, Mojave, and Sonoran. It also is very long-lived, creating clonal colonies; one found in California is believed to be over 10,000 years old and is considered one of the oldest single living organisms on the planet.

Creosote is useful to many desert species. The kangaroo rat likes to build its nest within the roots of the creosote bush. The seeds are a life source to many jackrabbits. The desert kit fox prefers to make its den within the roots of the creosote. Many cactus species use the creosote for shelter when the cactus is young and establishing its own root system.

This unassuming shrub originated in South America but it is clearly one of the most well-adapted plants found in the monument. The creosote has not only made its home in the heart of the Sonoran Desert but in the hearts of many desert natives as well.

Stop 3

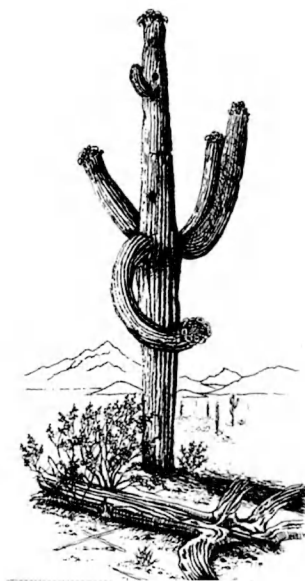
Mile 1.9 [km 3.1]

A Sonoran Desert Icon

You would think that the saguaro cactus, which dominates the landscape, would be one of those well-adapted, hardy desert species. It is certainly the tallest and largest cactus in the United States, growing as high as 50 feet and weighing several tons. It can live to be 200 years old. In Organ Pipe Cactus National Monument we think that these cacti flower for the first time at approximately 65 years of age and might produce their first arms at around 90. Of course there is no way to know exactly how old a saguaro is (it doesn't create growth rings like a tree). What we know comes from averaging data from hundreds of cacti all across the Sonoran Desert. Cacti living in washes or over by Tucson, where the water is more abundant, grow faster. Cacti growing in the valley flats, where water is scarce, can live their whole lives and never have the resources to support arm growth. A saguaro is entirely dependent on location and rainfall, as well as the ability of its shallow roots to suck up as much rain as possible to store in its spongy flesh.

Saguaros have adapted to the Sonoran Desert. They arrived in the region only 8,000 years ago, more recently than humans. Humans living here adapted their lives to include, even revere, the giant cactus. The Tohono O'odham have strong cultural ties to the saguaro. The first saguaro fruit harvest coincides with the Tohono O'odham New Year, when the summer monsoon rains fall on the parched desert. The O'odham use woody ribs of dead saguaros to create a tool, called a *kupit*, to reach the fruit clustered at the tops of the arms and crowns of the cacti.

The timing of the fruit ripening is impressive. Flowers appear in May and June when the desert is at its hottest and driest. The nectar is the only moisture in town, attracting important pollinators like birds and bats. The fruits ripen in July, in time for many animals to eat the delicious red fruits and transport thousands of seeds to new homes. Once the seeds are spread and the monsoon rains start, those seeds have the chance to grow into new giant saguaro.

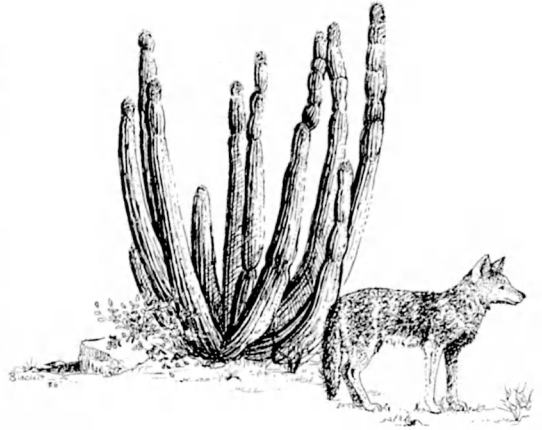


Even with all of the saguaro's adaptations to capture and conserve water, without the help of other species it would not survive here at all. It needs animals to pollinate and spread the seeds, and the assistance of other plant species to shelter young seedlings during the first fragile years of their lives. Its appearance as the master of the desert is deceiving. As you travel along what other plants dominate this habitat?

Our Namesake Cactus

Organ Pipe Cactus National Monument was established in 1937 by President Franklin D. Roosevelt and protects most of the natural habitat of the organ pipe cactus within the United States. While commonly found in the southern sections of the Sonoran Desert, these cacti are rare north of the U.S.–Mexico border but have adapted to life in the monument. Organ Pipe Cactus National Monument experiences only a few frosty nights a year, allowing the cacti to stay warm and flourish like their Mexican neighbors. Notice how these plants to your left are standing on the south-facing slopes with little vegetation near them. Organ pipe cacti crave the sun's heat and do not require nurse plants. At night the rocks surrounding the plant release heat stored during the day, thus keeping the plants from freezing.

In June and July, flowers and fruits cover the arms of these columnar cacti. The flowers only open at night, closing for good in the early morning light to keep water loss at a minimum. These lavender-tinged white flowers emit a strong fragrance to attract lesser long-nosed bats. Each summer these bats migrate from Mexico to feast on flower nectar, and the pregnant females give birth and nurse their young. They congregate at Organ Pipe Cactus National Monument, roosting within the monument's caves, buildings, and historical structures, such as abandoned mines, rock shelters, and old ranch houses. As summer progresses, the mothers and their babies gorge themselves on cactus fruits and distribute the seeds across the desert helping to ensure the survival of the organ pipe cactus.



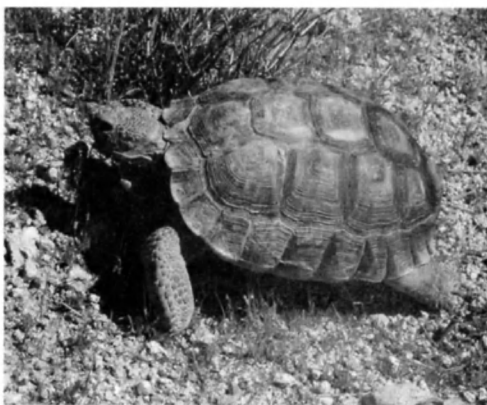
...established by President Roosevelt and protects the only natural habitat within the United States for the organ pipe cactus.

At Home in the Desert

The sounds of thunder and drumming of rain on the ground during a summer monsoon signal the spadefoot toad to emerge from its subterranean home to breed in temporary pools or tinajas. Eggs will hatch quickly. Tadpoles must mature to adulthood in as few as two weeks before the tinajas dry up. These adaptations to ephemeral ponds allow the spadefoot to thrive in the Sonoran Desert.

Have you ever walked across a sandy beach or wash? It's a remarkably tiresome job. The sidewinder is named for its ability to move over loose or unstable sand. This rattlesnake has adapted to living in the Sonoran Desert by moving, or winding, in a way that allows it to move across sandy surfaces quickly and efficiently. This winding movement gives the appearance that the snake is moving sideways.

Imagine spending up to nine months a year underground to escape the heat! The desert tortoise spends this much of its time below ground, coming out only to eat, drink and mate at dawn and dusk.



The summer monsoons offer tortoises a welcome respite from the dry landscape and they take advantage of these rains, increasing their outside activity.

Stop 6

Mile 5.5 [km 8.9]

Picnic Area with ramada

Farming a Dry Land

To your left is Diablo Wash, one of thousands of canyons within the monument that were inhabited by people as far back as 12,000 years ago. These people called the Sonoran Desert home, cleverly adapting their way of life to the desert's scarce and variable rainfall. A small settlement stood on the edges of this wash, inhabited from late spring through the fall. Family groups spent the hot dry foreshummer (May, June, and July) planting rows of drought-tolerant crops: corn, tepary beans and squash. They dug irrigation ditches between the rows and down into the wash below. When the monsoon rains of August began to pour onto the parched earth, the water collected in washes and flash-flooding occurred.

Dams were built in strategic places to divert the floodwaters into irrigation ditches where the water would be most useful. In a month's time, and with less than four inches of rain, crops would mature and produce a staple food source, without which humans could not have survived this environment.

The Tohono O'odham continued these dry-land farming practices learned from their ancestors. They built shade structures called *ramadas*, similar to those in our picnic areas, to shelter them from the harsh summer sun as they lived alongside the wash. They spent months planting crops and harvesting saguaro and organ pipe fruits, all the while praying and waiting for the life-sustaining rains to come.

Stop 7

Mile 6.0 [km 9.7]

Picnic Area

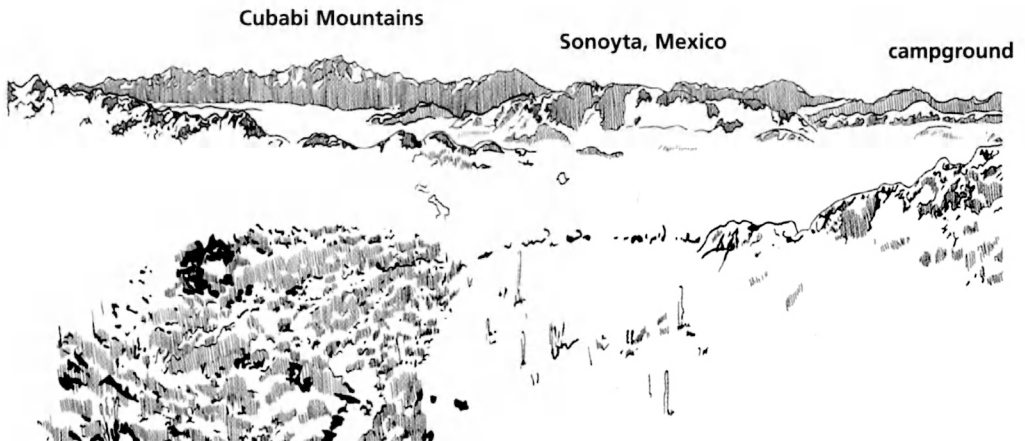
Hermana Means Sister

Scenic views are spectacular from the little rocky ridge to the west. Just below the ridge, the upper portion of Diablo Wash emerges from a steep canyon. Looking west from the ridge, the large, dark double summit of Twin Peaks rises above the Kris Eggle Visitor Center. The more distant craggy Cubabi Mountains to the south lie just beyond the town of Sonoyta, Mexico. Behind the Cubabis lies Reserva de la Biosfera El Pinacate y Gran Desierto de Altar or El Pinacate to the locals. This Mexican national park is the sister park to Organ Pipe Cactus National Monument, meaning the two parks work together on monitoring projects including wildlife migration, climate and weather trends, and human impacts on the park resources.

As you look across the desert, you are viewing a complex network of migratory routes for many animals that live in the Sonoran Desert. Washes just like Diablo

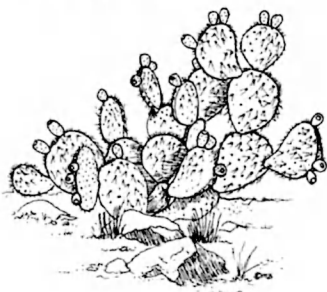
Canyon serve as primary routes of travel for hummingbirds, coyotes and javelina. Humans have traditionally used these pathways as well. Other species, like the endangered Sonoran pronghorn, prefer the open creosote flats. Biologists from both Organ Pipe and El Pinacate are studying wildlife migration, determining human impacts on wildlife and how the two park sites can better manage wildlife populations. State, federal and Mexican biologists have created the Sonoran Pronghorn Recovery Team, which conducts aerial surveys of pronghorn, provides support to local parklands and operates a captive breeding program.

This relationship with our sister park allows us to share information across a political boundary, collaborate efforts to protect animals like the pronghorn and to cooperate in preserving and conserving two vividly different wild lands.



Stop 8
Mile 7.1 [km 11.4]

The Prickly Pear



Many species of prickly pear cacti are familiar to travelers because prickly pear grows naturally throughout most of the Western Hemisphere. Abundant on the surrounding slopes is engelmann prickly pear, the most common prickly pear species in the monument.

Yellow flowers bloom along the edges of the flat pads from April through June. Deep purple fruits called *tunas* are an important food in many parts of Mexico and among Native Americans. The flat pads are modified stems, functioning in the place of leaves. The prickly pear has adapted to the desert by keeping its pads straight up and thus only receiving sun on its edges, preventing sunburn under the harsh noon sun.

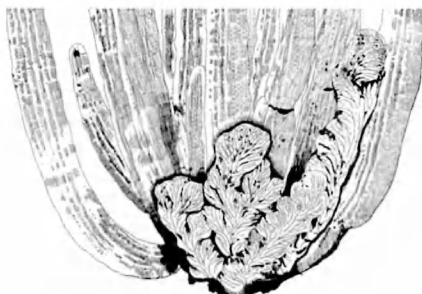
These cacti are very important to sustaining animals in the desert. They provide food for the javelina who, like goats, will eat anything. Tortoise love to eat the fruit. Prickly pear cacti prove useful to humans, too. The new pads, or *nopales*, are filled with juices and may be picked to make a great salad or a bittersweet jelly.



Stop 9
Mile 8.4 [km 13.5]

Take a Closer Look

Another cactus that is human-friendly is the organ pipe cactus. The fruit is made into sweet jams. As you look to the right you will see a phenomenon that does not disturb the fruit cycle. This organ pipe has an abnormal growth on an arm growing out of the center of the cactus. This growth is called a “crest” and can occur in almost all plant species.



A typical organ pipe cactus has growth cells on the tips of its arms. These cells grow in a circle to form our beloved columnar cactus. A crest can occur when the growth cells form a straight line instead of a circle. If you could peel back the skin and tissue of this organ pipe cactus, you would see the comparison of a normal straw-like skeleton to a mutated skeleton branching out like fingers of a hand. This beautiful phenomenon is unexplained in the scientific world. Some scientists believe that it is genetics; others believe it is a deformation due to frost; yet others think it may be caused by an imbalance in growth hormones. The truth is we don't know why this strange formation occurs.

Keep on the lookout for more crested cacti, both organ pipe and saguaro. Both may be seen along the Ajo Mountain Drive and throughout the Sonoran Desert.

Stop 10
Mile 8.7 [km 14]

The Cooler Climate of Canyon Country

The Ajo Mountains receive more rain than any other part of the monument and have cooler summer weather. Reflecting the high country climate, the jojoba bush and the evergreen scrub community is restricted to the rocky outcrops, boulder slopes and deep canyons of the Ajo range.

The high country plant communities support the elusive bighorn sheep and white tail deer that inhabit this area. Their hooves have adapted to allow them to

cling to rocky slopes and steep ravines. The mountain environment is especially attractive to turkey vultures, eagles, and ravens that nest in the canyons and ride the air currents that canyons provide. Caves and rock shelters within the canyon walls are also great roosting places for bats. The lesser long-nosed bats, which have already been mentioned, especially like to roost in the cool shaded canyons during the heat of a summer day.

Just up the road is the Arch Canyon trailhead parking. There are picnic tables and signs describing the geology of arch formation here in the monument, as well as a two-mile round trip trail that leads hikers into the foothills of the high country. The parking area is also a great place to pull over for scenic views of the arches – there are two visible, if you look closely.

Stop 11
Mile 10.4 [km 16.7]

Wintering in the High Country

Another higher elevation plant that prospers in cooler weather is the agave, commonly called the century plant. It even grows on the highest peak in the monument, Mount Ajo, which is on your left and marks the boundary between the monument and the Tohono O’odham Nation. Archeologists have discovered agave-roasting pits in the high country of

Organ Pipe Cactus National Monument. These pits are associated with the ancient people, who cultivated agave for ceremonial purposes. Why were they at the top of the Ajo Range?

Archeologists believe that the people would move to the high country canyons after fall harvest in the valleys. Canyons,

like Estes Canyon below and to your left, served as winter homes and watchmen were located at the tops of mountains to guard the community against raiders. The Tohono O'odham also used these canyons as winter homes. They were likely hunting mammals. These higher elevations also afforded a chance to catch more water. Snow and rain were more likely in the mountains. It is easy to imagine the people of the past making their way on foot up that

steep rugged hill. The promise of water in dependable tinajas, natural catchments in the rock that hold rain water, were their only source of water for miles. The ancient people and the Tohono O'odham adapted to the desert by moving biannually to find food and water. Their migratory routes were always associated with tinajas, springs, or other water sources and are still visible in the monument today.

Ahead is Estes Canyon, the midpoint of the Ajo Mountain Drive. Here you will find a ramada with picnic tables and restrooms. A loop trail leads into Estes Canyon and then climbs onto a ridge. It returns down through the foothills back to the parking area. Halfway around the loop a short spur trail climbs to Bull Pasture, which early ranchers used for their cattle. From the Bull Pasture Viewpoint hikers have a stunning view of Mount Ajo, the highest peak in the monument at 4,808 feet (1466 m). The trail, including the spur, is a fairly rugged 4.1 miles (6.6 km) round trip, with a total elevation gain of 865 feet (224 m). Ask at the Kris Eggle Visitor Center for more information.

Stop 12

Mile 11.3 [km 18.2]

The Essential Jojoba

The waist-high blue-green shrub growing along the sides of the road is jojoba. Tiny flowers grow on the male plants, producing pollen that is wind-deposited onto female plants. The female plants then produce an acorn-shaped seed in summer. These shrubs have adapted to the extreme

desert heat by keeping their leaf edges facing the harsh midday sun, thus reducing evaporation of precious water from broad, flat leaf surfaces.

The foliage provides year-round browse for animals like bighorn sheep and whitetail deer. The nuts are consumed by many animals, including squirrels, rabbits, birds, as well as humans. During times of hunger native people would eat the fat-rich seeds to suppress their appetites until food was again available.



The Trees of Life

The mesquite tree has long inhabited the land you see before you. The fruit is high in carbohydrates and attracts many different herbivores. The mesquite adapted seed dispersal so that when seedpods were eaten in great quantities, they were dispersed across the land. Rabbits, packrats, javelina, and coyote all depend on the seasonal seedpods for food. These animals, and others, help to scatter the mesquite seeds across the desert.

In the 1500s, missionaries introduced the cow, which allowed for even greater seed dispersal. Cattle no longer range in the monument but the abundance of mesquite serves as a reminder of their presence.

Often called the “Tree of Life”, many desert-dwellers owe their survival to the mesquite tree. The seeds were, and still are, ground into flour used for breads. These seeds have more protein than soybeans and were a major food source for the Tohono O’odham.

Another tree that sustains life in the desert is the palo verde. With its green trunk and branches, the palo verde has a very clever way of conserving moisture. By not having leaves during the hot season, it can photosynthesize and respire (that is to create energy and breathe) through its trunk, thus conserving water.

The palo verde can also serve as a nurse tree. Saguaro seeds need shelter from a nurse plant such as a creosote or palo verde tree. These plants protect the young cactus from sunburn, torrential floods,



Mesquite leaves and flowers

and the occasional winter frosts. Nurse trees such as the palo verde, mesquite, and ironwood even fertilize the young cacti as the trees fix nitrogen from the air into the soil for themselves. The young cactus is “nursed” as it grows up tall and strong, spreading its shallow root system out to collect rain as it falls. This is not good news for the nurse plant. As the cactus roots spread only 3-4 inches below the surface of the soil, what started as a shelter becomes a battlefield for water. The saguaro proves victorious. Many of the monument’s larger saguaros are surrounded by remains of their dead nurse trees.



Seed pods



Foothill Palo Verde



Flowers and miniscule leaves

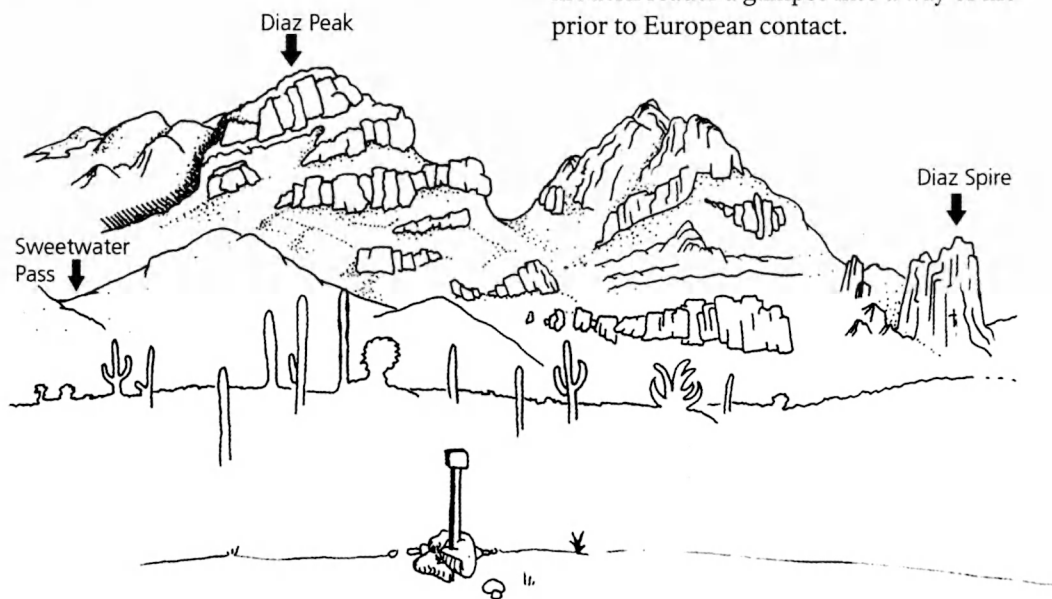
Traveling in the Footsteps of History

In the 1680s, Father Eusebio Francisco Kino arrived with orders to establish missions throughout the region. He worked with the O'odham people, teaching them about cattle grazing and learning human migratory routes in return. Padre Kino's expedition mapped the region, recording invaluable water sources and ancient pathways. The expedition quickly adapted to the region, learning that trails must be near water, among high mountains and through passes. Without this knowledge, Kino's expedition and the many people that have come since would surely have perished.

Many of the maps that Padre Kino created and the names he placed on them are still in use. Looking at a map of the monument today, one can immerse oneself in the history and geology of the

region. Bull Pasture gets its name from the monuments' ranching era; Twin Peaks is named for its double-peaked appearance; Pinkley Peak commemorates Frank Pinkley, Superintendent of Southwestern National Monuments 1923–1940. Behind each name is a story.

The Diaz Mountains are named for Captain Melchior Diaz, the leader of a 15-member group in the Coronado expedition of 1539–1542. In January 1541, when the expedition was close to here, Diaz suffered a freak accident and was mortally wounded. Diaz's men had no choice but to abandon any further explorations. During his 14 months and over 3500 miles of reconnaissance on behalf of the Coronado expedition, Melchior Diaz left a valuable legacy. The information he gathered on the native peoples he encountered offers the modern reader a glimpse into a way of life prior to European contact.

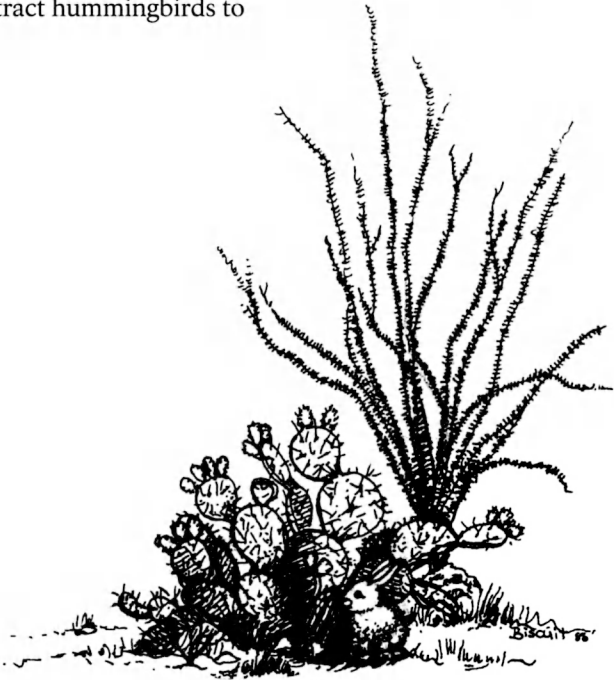


Waiting For Rain

Ocotillo looks splendid when there has been enough rain to allow for it to grow dark green leaves in a spiral pattern around its branches. It may look as if this plant is a cactus because of its spines, but don't be fooled, it is not a cactus! This plant belongs to the Candlewood family and is the only representative of this family in the United States. It's cousin, the boojum tree, grows mainly in Baja California, Mexico, and has been described as looking like an upside down carrot. These plants store water in their roots and stems. In drier times they shed their leaves and resemble long spiny sticks. Once the rain comes they restore just as if there was never a dry spell. Each spring leaves come out and brilliant orange-red flowers bloom at the ends of the stems. These flowers attract hummingbirds to

pollinate the plant and are vital to the ocotillo's survival. The nectar found within each tubular flower is an energy source, crucial to the hummingbird's survival during its long and arduous migration. This mutually beneficial relationship is another example of adaptation to the desert environment.

These plants are not only beautiful but useful. Ocotillos are resilient and have been used for roofs and living fences by the Tohono O'odham and other people in the area. When the branches are cut and planted in the ground, they often root, surviving to bloom again during the rainy seasons, creating a beautiful and useful fence or a lovely home.



A Forest of Spines

All around you is a small “forest” of pale yellow, tree-shaped cacti called chain-fruit cholla. They are called chain-fruit because fruit-upon-fruit hang down, creating long chains. The joints of the plant are biologically designed to detach as an animal is walking by within its spiny reach. The spines are barbed and hook



into the coat or flesh of the passer-by and the cholla joint is transported to a new location. If the conditions are favorable where it falls, the cholla joint might grow into a new plant. This cactus is sometimes referred to as a “jumping cholla” as the cholla joints seem to jump off the plant and attack unsuspecting passers-by. Reality is they don’t jump; they are just very efficient at picking up a ride. As you can imagine, picking up these hitchhikers is painful. Adapt your habits to the desert by using caution and carrying tweezers to remove any cholla joints when you are out walking.

You may be surprised to learn that some birds will take up residence in these cacti; the spines prove some defense against desert predators. As you continue, look for cactus wren nests; they resemble football-shaped clumps of weeds with a side hole big enough for the birds to go in and out.

Teddy Bear Pass

Do not be deceived by the cuddly name. These teddy bear cholla will bite rather than cuddle you to sleep. They get their name because they look fuzzy and cute, but look carefully and you’ll see millions of tiny hooked spines genetically designed to attach to anything that gets too close. These spines are an adaptation to the desert sun; they create shade for the cholla itself, reducing its exposure to the sun. Teddy bear cholla reproduce in the same manner as many chain-fruit cholla; by breaking off joints and rooting them into the ground. This means that all the cacti you see before you may have come from one plant that was dropped off in this area by an animal that brushed by another teddy bear cholla along his path. According to botanists, it is very possible that all the teddy bear cholla in the United States come from a single strain.

Packrats will take the cholla joints to make a very protective nest called a midden. See if you can find one of these middens. Packrats have been known to make multi-story middens in wood piles or dead cacti. Some very surprising information has been uncovered from these cholla-covered homes. A midden in the Puerto Blanco Mountains records the teddy bear chollas’ arrival here 10,000 years ago! This cactus migrated here when the Sonoran Desert was in its infancy and from the abundance found here at Teddy Bear Pass, it has adapted quite well.

What Does the Future Hold?

Organ Pipe Cactus National Monument is filled with plants, animals, and humans that have adapted to the Sonoran Desert's unique environment. Some species migrated here, some adapted to or survived the changing climate during the past 10,000 years, but all will need to continue evolving to adapt to this ever-changing environment. Long-term monitoring projects taking place within the monument and nearby wilderness reserves indicate that our climate has begun to change again. Many of the plant and animal species that we associate with the Sonoran Desert are threatened: bighorn sheep, the spadefoot toad, even our beloved saguaro. How will these species, and others, adapt to survive unforeseen changes? Can they adapt to the changing environment? What new species might move to the monument? What does the future hold for the Sonoran Desert? We are only beginning to understand these questions.

This desert is a magnificent living biome with relationships that span the entire space. Plants depend on animals to disperse their seed around the desert by ingestion and digestion or by transport. Animals depend on plants for food and shelter. Even plants depend on other plants for their survival (cacti and nurse trees). Just because you see something dead in the desert, don't assume that it has no purpose. Death begets life out here in the desert. A dead or dying saguaro may mean that a wood rat or a lizard may take comfort in its shade. The connections all over this incredible land are what make it the Sonoran Desert.

We hope you enjoyed your time on this loop drive and that you've learned the story of this mysterious Sonoran Desert: that everything is connected and comes full circle, that it is filled with amazing adaptations for survival, that we are just beginning to understand the Sonoran Desert, and that new things are being discovered every day. Whether it's connecting with this wondrous place, connecting to the nature around you, or simply connecting to yourself, there are endless discoveries waiting to be experienced in Organ Pipe Cactus National Monument.

*"It is not necessary to change.
Survival is not mandatory."*

Dr. W. Edwards Deming

Some Titles to Consider:

About Organ Pipe Cactus National Monument:

Trails Illustrated Topographic Map of Organ Pipe Cactus National Monument

Checklists of Native Species

Where Edges Meet

Natural History:

The Desert Smells Like Rain

A Natural History of the Sonoran Desert

Dry Borders

Parks After Dark

Cultural History:

Fragile Patterns

Food Plants of the Sonoran Desert



National Park Service
U.S. Department of the Interior



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