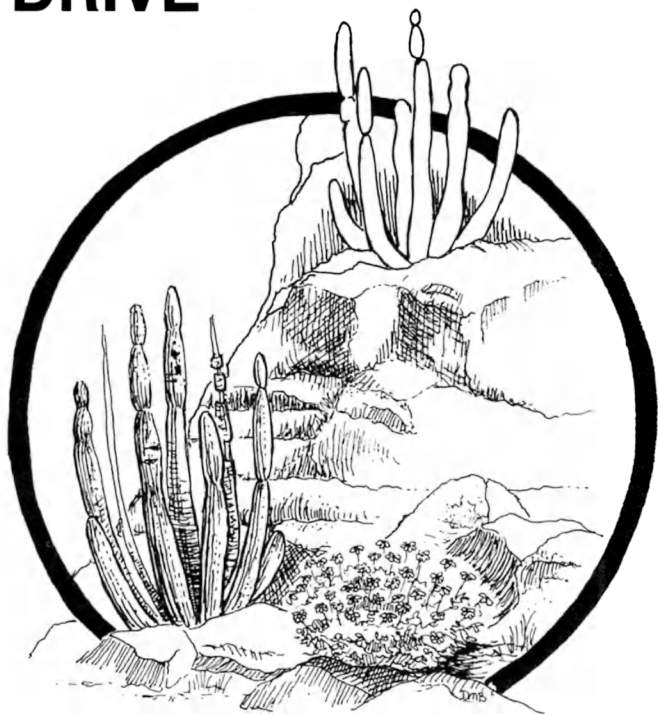


Organ Pipe Cactus

AJO MOUNTAIN DRIVE



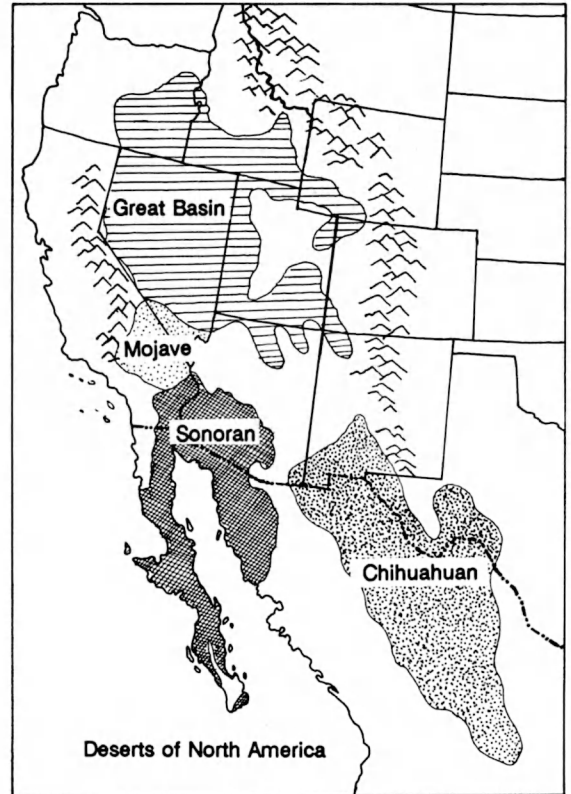
AJO MOUNTAIN DRIVE

- * Driving time 2 hours; length 21 miles (34 km).
- * Winding, one-way dirt road, not recommended for trailers, or for buses or motorhomes over 25 feet (8 m).
- * Driving or biking off roadway is prohibited.
- * Road subject to flooding; do not cross washes when flooded.
- * Several picnic areas available, one with full-access pit toilet. No campfires allowed.
- * No drinking water available for 21 miles (34 km).
- * Camping only allowed in campgrounds or in backcountry with permit; no vehicle camping on Ajo Mountain Drive.
- * All resources are protected; please do not disturb or collect plants, wildlife, rocks, minerals or artifacts.

1. THE SONORAN DESERT

Between the Rocky Mountains on the east and the Sierra Nevada on the west are the four distinct deserts of North America: Chihuahuan, Great Basin, Mojave, and Sonoran.

The Sonoran Desert covers portions of southern Arizona and California and two-thirds of it extends south into Mexico. Because of its low latitude and altitude, it is a warm desert, relative to the others. Its infrequency of freezes, combined with rainy seasons in both winter and late summer, allows the Sonoran Desert to support a greater diversity of plants and animals than the other North American deserts. Only in this desert do tree-sized columnar cacti dwarf the many small trees and shrubs which virtually blanket the landscape. And only in the Sonoran do desert plants grow tall and densely enough in places to be called a "forest." Organ Pipe Cactus National Monument is situated near the heart of the Sonoran desert.



2. MIXED SCRUB COMMUNITY

An assemblage of plants that grow together under certain environmental conditions is a plant community. Those environmental conditions include climatic factors such as temperature and rainfall, and physical factors such as soil type, slope, and drainage.

On the slopes to the left (north) is an example of the Mixed Scrub Community, typical of dry, rocky, volcanic hills in this region. The community is characterized by two small shrubs, brittlebush (*Encelia farinosa*) and triangle-leaf bursage (*Ambrosia deltoidea*), and scrubby, green palo verde trees (*Cercidium microphyllum*).

3. SAGUARO CACTUS

The tall cacti so abundant here are saguaros (*Carnegiea gigantea*), the largest species of cactus in the United States. A saguaro may grow 50 feet (15 m) high and weigh several tons. During periods of rainfall, horizontal roots near the surface quickly absorb whatever moisture is available in the soil to store in the stem and branches. The accordion-like pleating of the saguaro allows the plant to expand during wet times and to contract during periods of drought.

The saguaro blooms during May and June with clusters of flowers borne at the ends of the main stems and branches. The creamy white blossoms open in the evening, attracting nocturnal pollinators, such as bats. They remain open into the morning hours when white-winged doves, bees, and other pollinators sip the nectar or collect the pollen. In June and July the fruit matures and many animals feast on the ripe red pulp and its tiny black seeds.

Gila woodpeckers and common flickers carve holes in the saguaros for nests, and when they abandon these holes, other species of birds move in, such as the tiny elf owl.

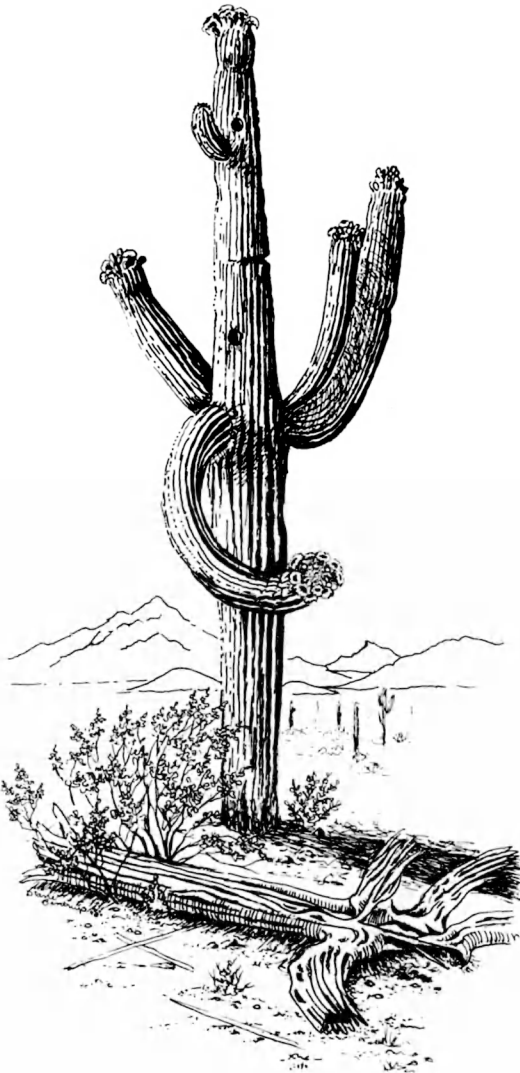
4. CREOSOTE BUSH

The lacy, olive-green shrub so common here is the creosote bush (*Larrea tridentata*). The bush sports small yellow blossoms in the spring and summer. It may occasionally blossom during other times of the year if rainfall is sufficient. The fruits are gray, fuzzy balls which resemble droplets of water as they hang from the stems.

To minimize water loss, the creosote has very small leaves, like many desert plants, and a varnish-like coating on the leaves which further reduces moisture loss.

Creosote bush is the most widespread shrub in the arid, hot, lower sections of the Sonoran, Chihuahuan, and Mojave Deserts. Nearly pure stands of it often grow in areas where the soil is unsuitable for most other plants.

Creosote bushes put out shoots from their bases, making clonal clusters of plants which grow to be extremely old. Some creosote bush clusters in California have been dated as being over 10,000 years old.



5. SOIL TYPES

In arid environments where rainfall is unpredictable and relatively infrequent, soil texture is an important factor in determining where a desert plant can grow. Soil texture influences the amount of moisture available for the roots of the plant.

For example, organ pipe cacti (*Stenocereus thurberi*) do not generally grow in the finely packed soils of the valleys and plains, but flourish on the rocky, well-drained southern slopes of the hills. A thriving stand is located to the left (north) on just such a hillside.

The rest of the drive presents many good examples of how the vegetation changes as the type of soil changes—rocky soil on the mountainsides; coarse, shallow soil on the lower slopes; and fine, sandy soil on the plains.

6. NURSE TREES

One saguaro cactus (*Carnegiea gigantea*) may produce millions of seeds in its lifetime, but only a few will survive to become mature plants. A seedling's chances of survival are greatly improved if it grows beneath the protective shade of a tree or shrub. The foothill palo verde (*Cercidium microphyllum*) on the left side of the road has been a "nurse tree" to the young saguaro growing up through its branches, providing it with shade, protection, insulation from winter cold, and enriched soil. Now the cactus is large enough to survive on its own. It may, in fact, eventually lead to the death of the palo verde by competing with its nurse tree for water.



Saguaro with Creosote Bush as a Nurse Tree

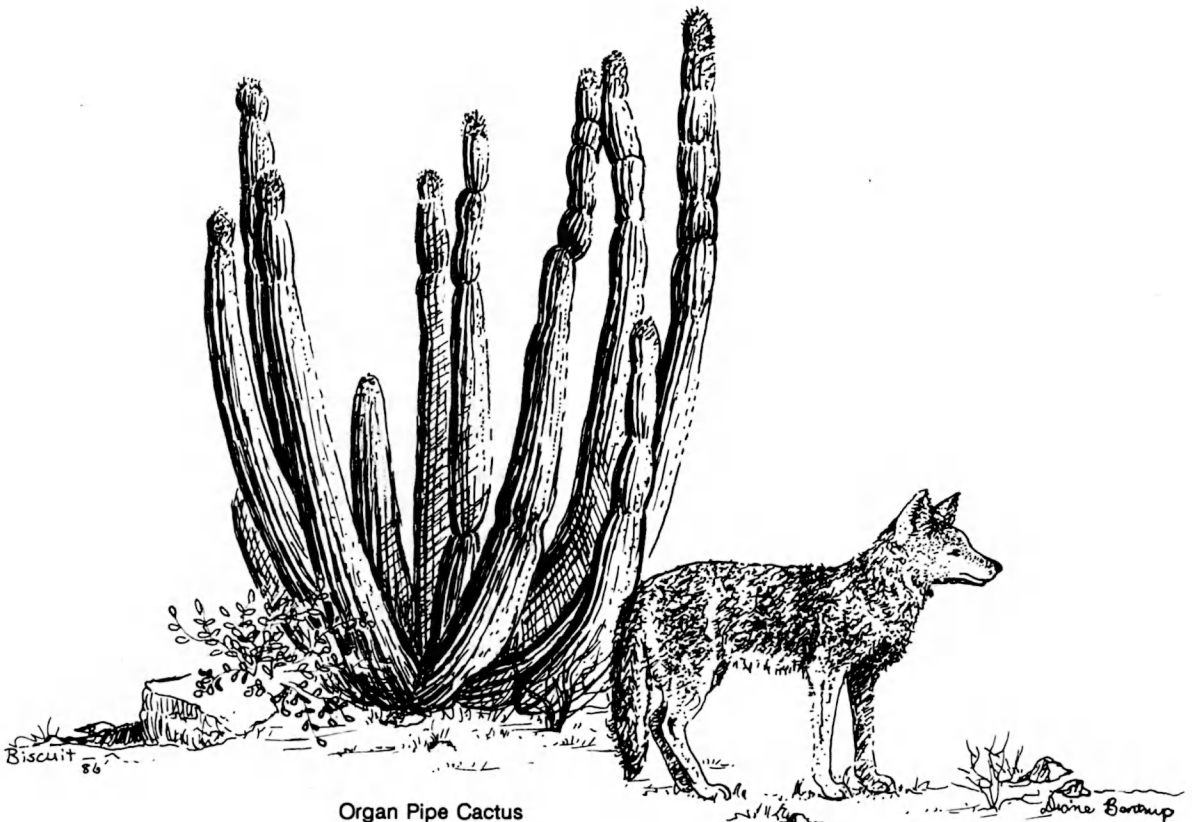
7. ORGAN PIPE CACTUS

In the United States, the organ pipe cactus (*Stenocereus thurberi*) grows mainly within Organ Pipe Cactus National Monument. But it can also be found in sparse stands in a few other U.S. locales within 80 miles (129 km) of the monument. In Mexico, it is common in the state of Sonora.

The white flowers, tinged with pink,

open at night to attract bats and insects necessary for pollination. They close the next morning as the heat of the day sets in.

The juicy, edible fruit, called *pithaya* in Mexico, matures in July. When the spherical fruit is fully ripe, birds puncture the skin and expose the bright red pulp and dozens of tiny black seeds, all of which is eaten by birds as well as other animals.



Organ Pipe Cactus



Chain-fruit Cholla

8. CHAIN-FRUIT CHOLLA

Straight ahead is a small "forest" of pale yellow, tree-shaped cacti called chain-fruit chollas (*Opuntia fulgida*). They are so named because the flowers and fruit are borne on the fruit of the previous year until long chains hang from the plant. The fruit is nearly always sterile and the cholla rarely reproduces by seed. Instead, the joints of the plant detach and litter the ground, where they

take root and grow new plants. The chain-fruit cholla is often called the "jumping cactus" because its spiny segments detach so easily and stick into skin or clothing.

The bird nests commonly found among the cholla branches belong to curve-billed thrashers and cactus wrens. The barbed spines offer a secure, spiny fortress which protects the nests from predators.

9. HUNTERS AND GATHERERS

The Diablo Canyon picnic area is an attractive spot for lunch or a rest. Below is Diablo Wash with its lush growth of moisture-loving trees and seasonal pools of water.

The wash and its surroundings were also attractive to prehistoric people. They relied on its critical natural resources—water, plants, and animals—for their survival. The chipped stone tools and the *manos* and *metates* (flat grinding stones) found in this area tell us that hunters and gatherers camped here during the Archaic period, 7,000 B.C.- A.D. 150.

Early Archaic period sites contain only chipped stone tools, such as projectile points, scrapers, and knives. The people of that time must have lived primarily by hunting. Later Archaic sites include *manos* and *metates* as well. This suggests a change in the people's way of life to include gathering and processing wild plant foods found along the margins of the wash.

In later years (A.D. 150-1450), the Hohokam Indians also had camps in this area for tasks such as grinding flour from mesquite beans and hunting game.

10. BIRDSEYE POINT

The little rocky ridge to the left (west) offers a fine scenic view. Just below the ridge, the upper portion of Diablo Wash emerges from a steep canyon. Looking to the west from the ridge, the large, dark double summit of Twin Peaks rises above the visitor center. The more distant craggy Cubabi Mountains to the south are in Mexico, just beyond the town of Sonoita.

The moss-like plant carpeting some of the rocks here on the ridge is club moss (*Selaginella arizonica*), a very primitive plant. It is dry, gray, and inconspicuous during much of the year, but after adequate rainfall, it turns lush and green. Because of its ability to come to life after dormant periods, it is also called "resurrection plant."

11. AJO MOUNTAINS

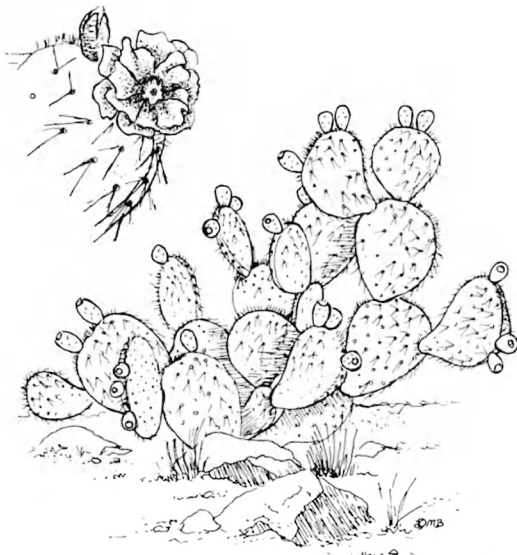
The walls of the Ajo Mountains tower ahead. This colorful range, like nearly all of the mountains in the monument, is made up of rocks which formed during periods of volcanic activity 14 to 22 million years ago. The dark layers in the cliff walls originated from lava that oozed through cracks in the earth's crust and flowed out on the surface, forming thick layers. The light colored bands are made of *tuff*, compressed volcanic ash spewed out in volcanic explosions.

The massive structure of the present range came at a later time when great upheavals broke and thrust huge blocks of the volcanic rocks upward, through a process called block faulting. Subsequent erosion along fractures and fault lines created the many canyons present today.

The highest point in the monument is Mount Ajo, 4,808 feet (1466 m) above sea level. The peak can be climbed by an experienced hiker with adequate time and energy, but there is no trail and the ascent is steep and rough. There is a summit register at the top.

12. PRICKLY PEAR CACTUS

The prickly pear is a familiar cactus to many travelers because it grows in most of the fifty states. Abundant on the surrounding slopes is Engelmann prickly pear (*Opuntia engelmannii*), 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 *tunas* are an important fruit in many parts of Mexico and among Arizona Indians. The flat pads are modified stems, functioning in the place of leaves. An elusive pig-like animal called a javelina eats the pads, spines and all.



Engelmann Prickly Pear

13. HIGH COUNTRY

Natural arches are rare in the monument and the few that do exist are mostly in the Ajo Mountains. This arch in Arch Canyon was formed by the freezing and thawing of water and the carving force of wind.

The Ajos receive more rain and have cooler weather than any other part of the monument. Occasionally the highest ridges are dusted with snow. Reflecting the high country climate, the Jojoba/Evergreen Scrubland Community is restricted to the rock outcrops, boulder slopes, and canyons of the Ajos. Typical plants of this community include jojoba (*Simmondsia chinensis*), century plant (*Agave* spp.) and goldeneye (*Viguiera parishii*). Another important community member is a type of oak (*Quercus turbinella* ssp. *ajoensis*), found only in the monument and two other locations in southwest Arizona. A relict population of juniper (*Juniperus erythrocarpa*), left over from a wetter era several thousand years ago, also survives on the highest ridges of the Ajos and in the canyons. Many of the plant species that grow in the Ajos are not found at lower elevations in the monument.

14. MIXED CACTUS/PALO VERDE COMMUNITY

The Mixed Cactus/Palo Verde Community thrives in the foothills (*bajada* slopes) of the mountains in the monument. Here, the amount of rainfall is higher than on the dry plains, but lower than in the mountains. Organ pipe, saguaro, prickly pear, and cholla cacti all share the gravelly slopes. Foothill palo verde trees (*Cercidium microphyllum*) grow alongside the cacti. Because the bajada slopes cover such a wide area, this plant community is the most common in the region and covers nearly half of the monument.

The Mixed Cactus/Palo Verde Community also encompasses a variety of annual plants. If enough rain falls at the right times during the winter, the bajada slopes can produce the best displays of spring wildflowers in the monument. It is on these slopes, too, that lush stands of grasses will grow if rainfall is above average in the summer.

15. ESTES CANYON PICNIC AREA

Estes Canyon is approximately the mid-point of the Ajo Mountain Drive. A loop trail leads from here into Estes Canyon and then climbs onto a ridge. It returns down through the foothills to the parking area. Halfway around the loop, a short spur trail climbs to Bull Pasture, a meadow-like basin which was used by early ranchers as a pasture for their cattle. The trail, including the spur, is a fairly rugged 4.1 miles (6.6 km) round trip, with a total elevation gain of about 800 feet (244 m). Water is not available along the way, so carry your own.

The cool and wet mountain canyons and high country have more variety and a greater abundance of plants and animals than do the slopes and plains below. In particular, increased rainfall, abundant food, cooler temperatures, and a few dependable *tinajas* (natural catchments in the rock which hold rainwater) combine to create an environment that is well suited for wildlife, including bighorn sheep.

16. JOJOBA

The waist-high, blue-green shrub growing on both sides of the road is *jojoba* (*Simmondsia chinensis*). The thick, evergreen leaves of the jojoba are good browse for bighorn sheep and whitetail deer.

The leaves of this plant keep their edges toward the sun, thus reducing evaporation of precious water from their broad, flat surfaces.

The jojoba produces nuts which have long been used as a medicine by local Indian people and as a coffee substitute in Mexico.

Today, jojoba is a commercial crop cultivated on thousands of desert acres because its valuable liquid wax can be produced with minimal irrigation. This oil-like wax is used in cosmetics, shampoos, and in machinery lubricants.



Jojoba

17. MEXICAN JUMPING BEAN

The dark green shrubs to the right across the road are Mexican jumping beans (*Sapium biloculare*). This species is uncommon in the United States, growing only in portions of southwestern Arizona on rocky slopes and along washes. Although this shrub is a member of the spurge family, its leaves somewhat resemble those of a willow. It produces a toxic, milky juice which was used as a poison for arrow tips by Indians in northern Mexico. It also produces an irritating smoke if burned.

The so-called "jumping beans" are actually the seeds of the plant which are often infested with a moth larva. In moving about, the larva causes the seed to jump or turn over. The term "jumping bean" is more correctly applied to another shrub in the spurge family which grows in Mexico and is famous for its jumping seeds.



Mexican Jumping Bean

18. DIAZ SPIRE

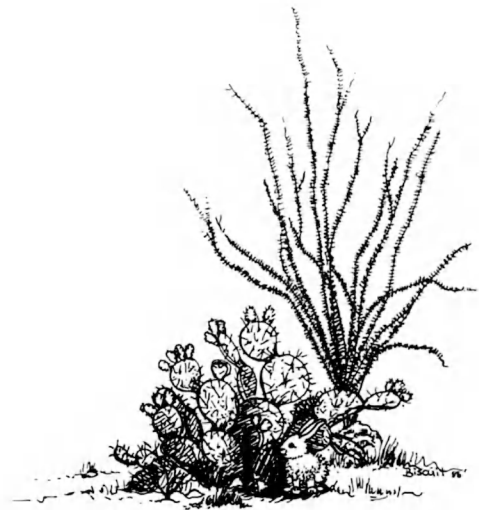
To the left toward the southeast is Diaz Spire. Diaz Peak, 4,024 feet (1,227 m), is behind the spire but out of sight. The peak and spire are separated from the main Ajo Mountains by Sweetwater Pass. It was through this pass that Tohono O'odham Indians from east of the mountains came to harvest cactus fruits of the area during the 1800s. The many small caves in the hillsides were used by these people as temporary shelters.

The spire and peak are named in honor of Melchior Diaz, a captain in the famed Coronado expedition. Diaz is believed to have crossed this region with a small band of Spaniards in 1540.

19. OCOTILLO

The ocotillo (*Fouquieria splendens*), with its long graceful stems, is common here. Even though it is armed with spines, it is not a cactus. It belongs to the ocotillo family and is the only representative of this family in the United States. A related species is the strange boojum tree (*Fouquieria columnaris*), which grows mainly in Baja California, Mexico.

Not being a water storer like the cacti and other succulents, the ocotillo meets the long dry spells in an unusual way. It bears leaves after rains, but drops them when the soil dries out. Depending on the frequency of rain, the branches can become leafy wands of green several times a year.



Ocotillo and Prickly Pear

A spike of flame-red blossoms is borne at the end of each stem in April and May, and often coincides with the arrival of migrating hummingbirds. Ocotillo is used locally for fences and ramadas and as a roofing material.

20. CACTUS TRAIL

A short trail to the right (north) passes several species of cacti. Cacti are characteristic of warm deserts such as this one, but they are not restricted to hot, dry lands. They range as far north as central Canada and extend throughout most of South America. Twenty-seven species of cacti are protected within Organ Pipe Cactus National Monument.

21. TEDDYBEAR PASS

Teddybear Pass is named for its army of teddybear cholla cacti (*Opuntia bigelovii*), easily recognized by their shimmering yellow, fuzzy appearance. Joints of the cholla are easily broken from the plant by wind or animals, and each can produce a new cactus. Like the organ pipe, the teddybear cholla thrives on rocky southern slopes such as the one to the right (north) where temperatures are warm and the soil is well-drained.

Approximately 200 yards (180 m) down the trail to the south on the left side of the road, is an organ pipe cactus

(*Stenocereus thurberi*) with an abnormal, fan-shaped growth. This abnormality, a "crystate" growth form, as it is called, has not been satisfactorily explained. It also occurs on saguaro (*Carnegiea gigantea*) and occasionally on other cacti.

22. BAJADA

Slowly through time, the erosional forces of water freezing, thawing, and flooding have been eating away at the great uplifted mountain ranges of this desert. The eroded material washes down from the mountains and is deposited to form broad alluvial fans of gravel and soil. At the top of the fans, the alluvium is coarse and rocky, but as the slope gradually tapers to the valley floor, it becomes finer. The sweeping alluvial fans join together to form gravelly slopes, like this one, which are best known as *bajadas*.

**National Monument
National Park Service
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