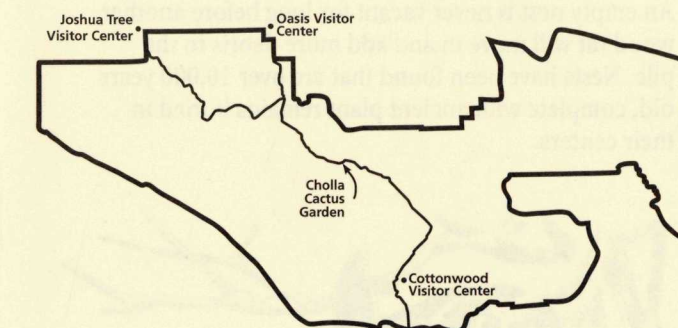


Cholla Cactus Garden

Self-Guiding Nature Trail

Perhaps you saw a side-blotched lizard dart across the path or a red-tailed hawk soaring overhead as you walked along this trail. To live here requires special adaptations in the roots, leaves, and seeds of plants and in the life cycle and physiology of animals. Life abounds, and what may seem to us to be a most hostile environment can be hospitable to others.

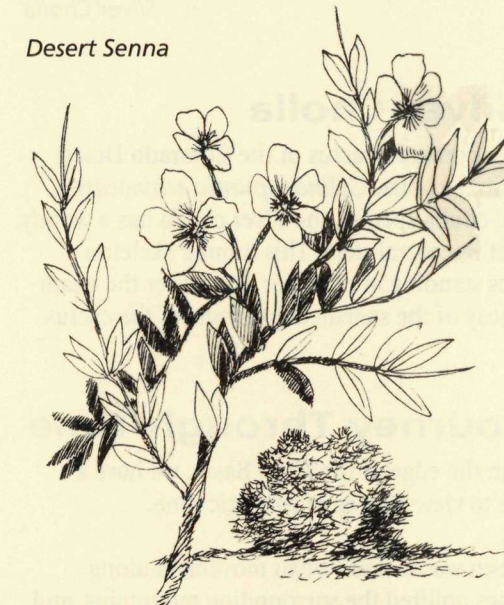
Joshua Tree National Park



15. Cactus Cooking

The buds of the teddy-bear cholla usually begin to appear in April, later opening into a greenish-yellow bloom. In years past, the desert-dwelling Cahuilla Indians would gather the tender buds for food. To avoid the thick, barbed spines, the buds were broken off with a stick and collected in baskets. Later, the cacti buds would be steamed for several hours in a pit lined with hot stones. After this lengthy preparation, the Cahuilla would enjoy some of the cooked buds on the spot but store the rest for future use.

Desert Senna



16. Desert Senna— Dead Or Alive?

During much of the year the desert senna, *Senna armata*, looks like it is dead. Except for a brief period in the spring, it is leafless. In April and May however, it really comes alive with masses of bright yellow, fragrant flowers.

Most relatives of desert senna are tropical species. They all have large, evergreen leaves adapted to moist climates; the desert senna produces small, short-lived leaves that reduce moisture loss.

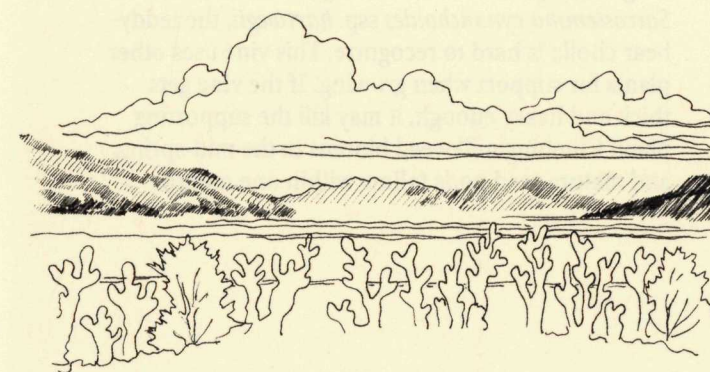
13. Water and Cactus

Cholla roots spread close to the surface of the soil so they can quickly take up the water from soft, penetrating rains. Their long, corky-barked roots are often several meters in length. They rapidly develop delicate root hairs to absorb moisture when it is available. The water is stored in their fat stems and is given up very slowly, even during the hottest days. In times of drought, the root hairs wither and die to reduce water loss. Meanwhile the roots, protected by their thick bark, remain moist and succulent.

14. Pinto Basin Landscape

Pinto Mountain is the round-topped mountain rising to the left of Pinto Basin. Its varied colors must have reminded someone of a pinto horse. At the base of the mountain are a series of small hills covered with layers of sand, deposited over time by the desert winds. The far side of the basin is bordered by the Eagle Mountains, which have deep canyons, secluded palm oases, and high-elevation pinyon pine forests. The closest mountain range to the right is the Hexie Mountains. On the far distant horizon, between the Pinto and the Eagle Mountains, are the precipitous Coxcomb Mountains. These peaks, some 33 miles away, form the eastern boundary of both the Pinto Basin and Joshua Tree National Park. They rank among the most rugged and inaccessible of Southern California's desert peaks.

Pinto Basin

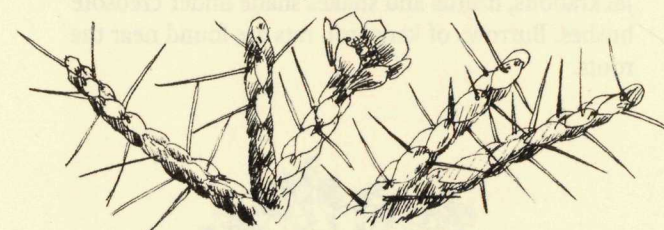


11. Cactus Wrens

Among the animals that find the thorns of the cholla no threat are birds. They perch on a cactus without so much as a preliminary hovering to pick a spot. The thickets of spiny branches provide a well-protected nesting site for many species.

The cactus wren, *Campylorhynchus brunneicapillus*, is one of the world's largest wrens. It nests almost exclusively in different species of cactus. Look for a football-shaped nest of straw with its characteristic side-tunnel entrance. The nest is formed by an interwoven network of slender stems and branches of wildflowers. These nests are made so sturdily they can last for many years. Cactus wrens usually construct more than one nest. The female lays her eggs in one nest while the male builds another for a second clutch. In winter, the birds roost singly in the nests.

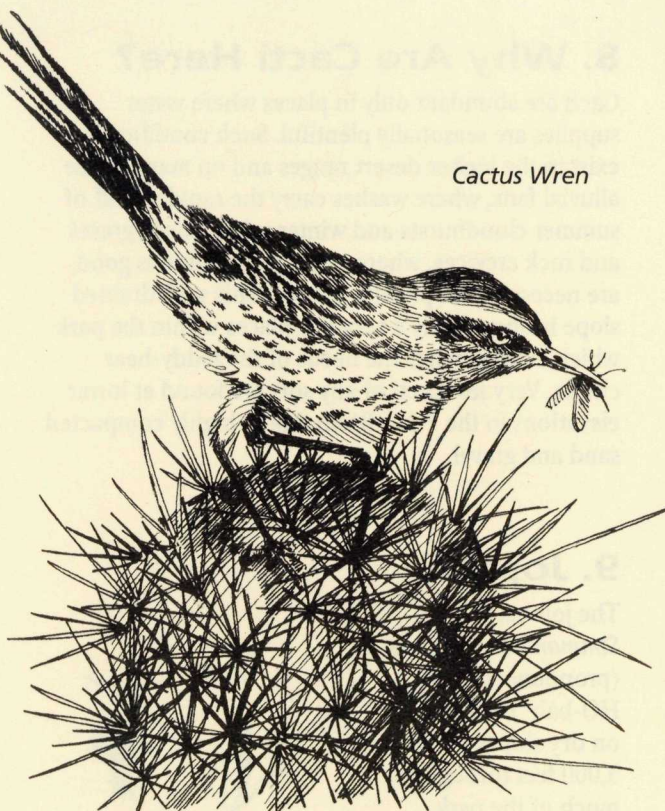
Pencil Cholla



12. The Pencil Cholla

Here is a cactus that is relatively safe to investigate a little more closely. The name, pencil cholla, *Opuntia ramosissima*, refers to the long, slim, cylindrical joints. A closer look reveals that these branches are covered with small, diamond-shaped plates (another common name is diamond cholla). From each plate emerges a long, barbed spine covered with a papery sheath, like a scabbard on a sword. An even closer look at the base of the spine shows a white patch. This white patch is composed of thousands of tiny, hair-like spines called glochids. Because they are so hard to see, they are even harder to remove from the skin than the long, barbed spines.

Cactus Wren



10. "Dead" Cholla

Visitors to the Cholla Cactus Garden are sometimes concerned about the fire which burned the cactus. But the truth is, this area never burned. The dark brown color of the lower joints and trunk is due to the dead, discolored spines. The cacti are healthy and continue to grow and produce new stem segments, or joints. As new joints become older, they detach readily from the parent plant. This is one of nature's most effective methods of vegetative reproduction. The detached joints will quickly develop roots and grow into new individuals. Many times this reproductive process occurs right at the base of the cactus. The joints also hitchhike on many desert animals, who unknowingly carry them great distances before they fall off, starting a new cholla colony. Cholla cacti do flower and produce seeds, but the seeds are usually sterile.



Located on the wetern rim of the Pinto Basin, the Cholla Cactus Garden provides habitat for a variety of plants and animals whose complex relationships with their environment and with one another make their survival possible.

Seldom does more than a scant four inches of rain fall here within a year's time. As summer approaches, the Pinto Basin begins to pulsate with heat, causing the sea of creosote bushes that grow here to appear like a shimmering mirage of green. The plants and animals of the Pinto Basin are, however, well adapted to survive in such a hot and arid environment.

A note of caution as you walk this nature trail: Be on guard that you do not walk too close to the cholla caeius. At the slightest touch, the spines will pena cate your flesh and are extracted only with difhltulty and pain. Be especially watchful of small children and stay on the trail. Dogs are not allowed on trails in the park.

1. Jumping Teddy Bears

From a distance, the top joints of *Cylindropuntia bigelovii*, a species of cholla (pronounced choy-ya), appear to be covered with soft, silvery bristles, which accounts for its common name, "teddy-bear" cholla.

However, each of its spines is tipped with a microscopic barb, and if you try to "hug the bear" or simply brush up against it, the spines will penetrate your shirt, your shoe, your pants, and especially your skin, causing the joint to detach and stay with you. Then the origin of its second nickname, "jumping cholla," becomes apparent.

On the ground, the detached joints readily generate new plants that can form dense stands of cloned cholla such as you see here in the Cholla Cactus Garden.

2. The Desert Wood Rat

The industrious builder of this prickly nest is the desert wood rat, *Neotoma lepida*. Also known as a pack rat for its habit of using all sorts of materials in its nest, this small rodent is well-adapted to areas with little water. It can derive sufficient moisture from the various plants and seeds it eats.

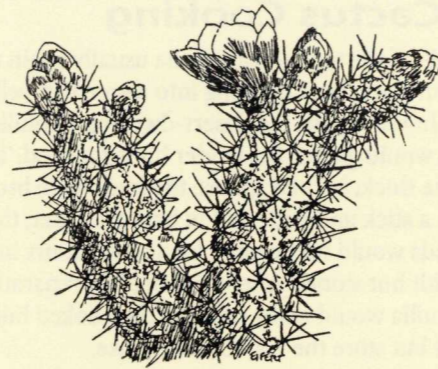
Seldom seen during the day, wood rats scamper nimbly over the cholla cacti looking for food after sunset. When a cholla joint becomes attached, the patient wood rat stops and bites off the spines.

Can you see the natural "armor" with which the rat protects its home? The cholla joints also line the runway to its nest. These spiny joints protect against such natural enemies as coyotes and kit foxes. However, the cactus does not prevent snakes from reaching the wood rat dens. Several species of snakes feed on these rodents, helping to keep their numbers in balance with the community.

An empty nest is never vacant for long before another wood rat will move in and add more debris to the pile. Nests have been found that are over 10,000 years old, complete with ancient plant remains buried in their centers.



Wood Rat



Silver Cholla

3. Silver Cholla

Another common cactus of the Colorado Desert is the silver cholla, *Cylindropuntia echinocarpa*. Like all cholla species, the silver cholla has a woody, supportive central stem. This tubular skeleton remains standing in place for years after the death and decay of the succulent portions of the cactus.

4. Journey Through Time

Here on the edge of the Pinto Basin, we have a chance to view a piece of geologic time.

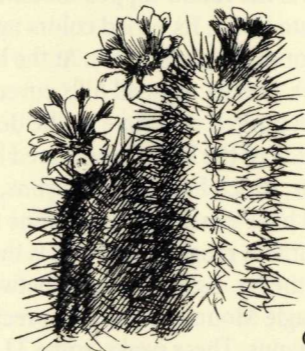
The basin was formed when movement along faultlines uplifted the surrounding mountains, and the land between subsided. During a wetter past, the basin held a shallow lake. Now, sand and gravel fans spread from the canyon mouths filling the basin.

Over thousands of years, the powerful erosive force of water combined with gravity made significant changes in this landscape. These mountain ranges were once very tall, but now their bases are buried in their own rubble.

5. A Calico Cactus ??

This colorful hedgehog cactus, *Enchinocereus engelmannii*, is also called calico cactus, after a type of multi-colored cloth. The spines vary from tan to strawberry red and, besides being beautiful, serve several functional purposes. They protect the plant from animals, shade the cactus to prevent overheating, and reduce the drying effects of the wind.

In the spring, the cactus will be covered with bright magenta flowers, which stand in stark contrast to the surrounding desert.



Calico Cactus

6. Climbing Milkweed

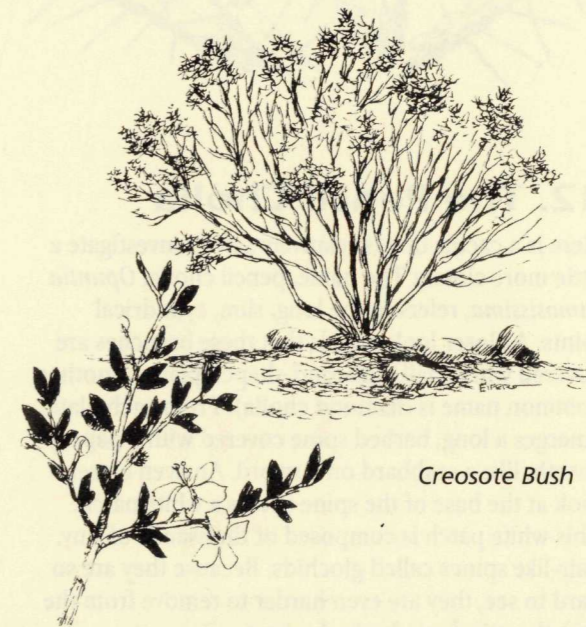
Disguised by a cover of climbing milkweed, *Sarcostemma cynanchoides* ssp. *hartwegii*, the teddy-bear cholla is hard to recognize. This vine uses other plants for support when growing. If the vine gets thick and heavy enough, it may kill the supporting plant. Climbing milkweed blooms in the mid-spring, and mature seed pods follow within one month.

7. Creosote Bush

The creosote bush, *Larrea tridentata*, is well-adapted to prolonged heat and dryness. Some roots of the creosote bush reach deeply for moisture; others remain near the surface to absorb any brief rainfall. But this dual system cannot always keep pace with the rate of water loss occurring through the leaves.

When water loss exceeds moisture availability, some of the small, waxy leaves are shed. The first to drop is the fresh, light green spring growth. This occurs in mid-summer, leaving the dark, olive green leaves behind. These leaves remain on the plant throughout most of the year. They are the principal source of the bush's aromatic odor. But if drought continues, these leaves will also be shed. The last leaves left on the sparsely covered bush are brown and hard. They are able to continue functioning even during the severest drought.

Jackrabbits, lizards and snakes shade under creosote bushes. Burrows of kangaroo rats are found near the roots.



Creosote Bush

8. Why Are Cacti Here?

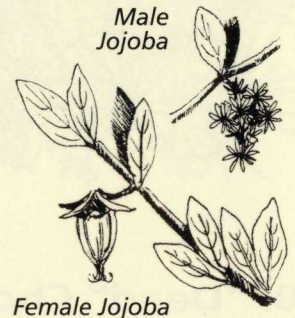
Cacti are abundant only in places where water supplies are seasonally plentiful. Such conditions exist in the higher desert ranges and on many of the alluvial fans, where washes carry the rapid runoff of summer cloudbursts and winter rains. Loose gravel and rock crevices, where water percolation is good, are necessary for prolific growth. This well-drained slope is one of only a very few places within the park which exactly meets the needs of the teddy-bear cholla. Very few cacti of any sort are found at lower elevations in the Pinto Basin due to highly compacted sand and gravel.

9. Jojoba

The jojoba, *Simmondsia chinensis*, (pronounced "ho-HO-bah") is found on dry slopes below 5,000 feet throughout much of the park. Unlike most desert plants, this shrub has fairly large, evergreen leaves. The leaves are covered with thousands of tiny white hairs to prevent overheating and water loss. The leaves stand almost vertical when the sun is directly overhead, reducing the amount of light they receive.

Male and female flowers of the jojoba are borne on separate plants. The female flower, when pollinated, ripens into a single oily nut.

The white-tailed antelope ground squirrel, *Ammospermophilus leucurus*, helps in jojoba reproduction by storing jojoba seeds just under the soil where they may later sprout and grow.



Female Jojoba

Male Jojoba

