

JOSHUA TREE NATIONAL PARK



CHOLLA CACTUS  
GARDEN

SELF-GUIDING NATURE TRAIL



You are now in the low desert country of the Pinto Basin, a place of extremes. As summer approaches, the basin begins to pulsate with heat waves that can exceed 115° F daily (46° C). The sea of creosote bushes appears like a mirage of shimmering green, and the mountains are transformed into a haze of flickering blue. Seldom does more than a scant four inches of rain fall here within a year's time.

Yet life persists against seemingly impossible odds. The plants and animals of the Pinto Basin have developed some unbelievable adaptations to solve the problems presented by these extremes. You may also be surprised to discover the close relationships between the living things of the Cholla Cactus Garden.

Be on guard because cholla seem to jump. At the slightest touch, the spines penetrate the flesh and are extracted only with difficulty and pain. Be especially watchful of small children and pets.

*Please remember that dogs must be on a leash in the park and are not allowed on trails.*

## 1. JUMPING TEDDY BEARS

Across the Pinto Basin, the most widespread plant is the creosote bush, but in a few areas the cholla (pronounced choy-ya) cactus dominates the landscape. From a distance, the top joints of this species of cholla appear to be covered with soft, silvery bristles, which accounts for its common name, "teddy bear" cholla, *Opuntia bigelovii*. Each of the spines is tipped with a microscopic barb, and if one tries to "hug the bear" or accidentally brushes up against it, the spines will drive deep into the skin, causing the joint to detach and stay with you. Then the origin of the second nickname, "jumping cholla," suddenly becomes apparent. Despite all the evidence to the contrary, the cholla cannot jump—this is simply a very painful illusion.

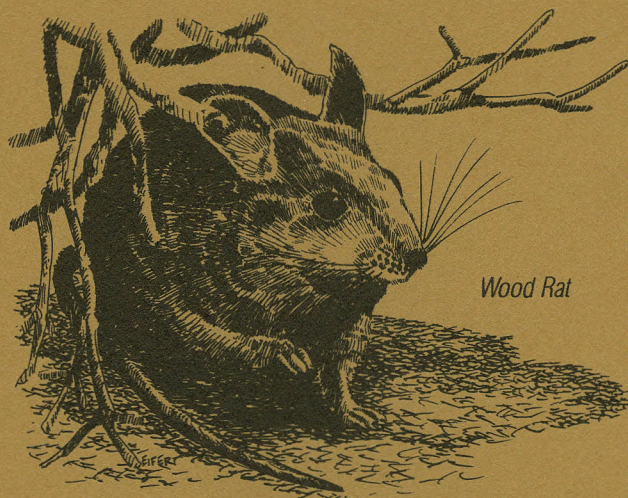
## 2. THE DESERT WOOD RAT

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

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.

Wood rats are seldom seen during daylight hours. As soon as night falls, the wood rats are out scrambling with remarkable ease over the cholla cacti. While gathering their food, they often become stuck by a cholla joint. Rather than struggle, the wood rat patiently turns and bites off the spines.

An empty nest is never vacant for long, as 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, *Opuntia 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, a stark reminder of this harsh environment.

### 4. JOURNEY THROUGH TIME

In the desert, geology is easy to see and enjoy because of the lack of heavy vegetation. On the edge of the Pinto Basin, where the Cholla Cactus Garden is located, we have a chance to view a piece of geologic time.

The Pinto 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 into the basin and slowly fill it. Over thousands of years, the erosive forces of water and gravity accomplish their task, and their power makes significant changes in the 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, *Echinocereus 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 may be covered with bright magenta flowers. The cactus flower's vibrant color stands in stark contrast to the surrounding desert.



Calico Cactus

### 6. THE 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. THE 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 in sets. The first set 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 third and last set of leaves left on the sparsely covered bush are brown and hard. They are able to continue functioning even during the severest drought.

Lizards and snakes often take refuge from the hot sun in the shade of the creosote bush. Burrows of kangaroo rats and other rodents are found near the roots, which help support the passages.



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. THE 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.

Another interesting aspect of the jojoba is that male and female flowers are borne on separate plants. The female flower, when pollinated, ripens into a single oily nut, which tastes much like a filbert but is slightly bitter due to the presence of tannic acid. The high-quality oil, commercially extracted from jojoba seeds grown on farms, is used for beauty products and lubrication of precision instruments.

One often finds the little white-tailed antelope ground squirrel, *Ammospermophilus leucurus*, rummaging through the jojoba branches, gathering and eating the fresh nuts. This small animal helps in jojoba reproduction by storing the seeds just under the soil.

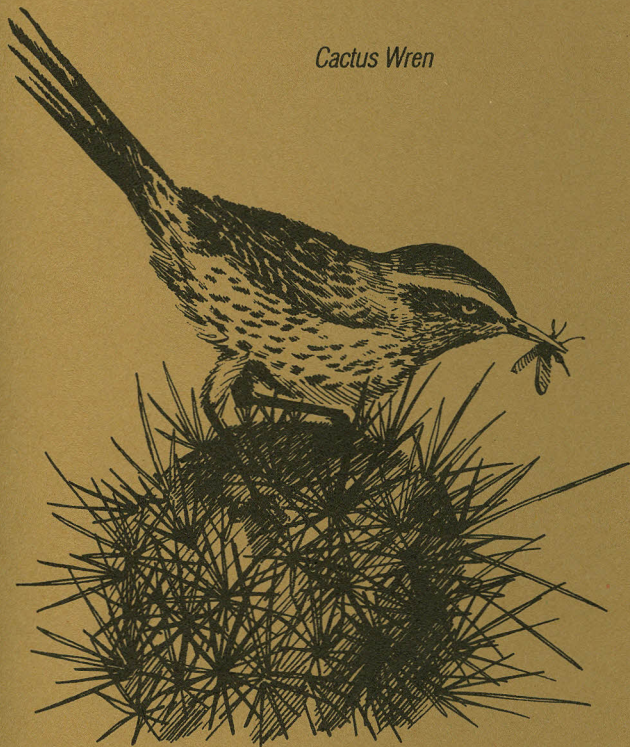
Male Jojoba



Female Jojoba



Cactus Wren



## 10. AGE AND THE 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.

## 11. THE CACTUS WREN AND OTHERS

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.



### 13. WATER AND CACTUS

The roots of cholla spread out close to the surface of the soil where they can quickly take up the water from soft, penetrating rains. These corky-barked roots are long, many of them several meters in length. They rapidly develop delicate root hairs to absorb moisture when it is available. The water is stored in the 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, while the roots remain moist and succulent, protected by a thick bark.

### 14. PINTO BASIN LANDSCAPE

Pinto Mountain is the round-topped mountain rising to the left of Pinto Basin. It was named "pinto" because of its varied colors similar to 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

### 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 twelve hours or more 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.

### 16. DESERT SENNA— DEAD OR ALIVE?

Many people think the desert senna, *Senna armata*, is dead. During much of the year this impression is understandable. It is leafless, except for a brief period in the spring when tiny leaves appear. A mass of bright yellow, fragrant flowers burst out in April and May. This is one of the most beautiful of desert shrubs.

This plant is particularly interesting because most of its relatives are tropical species. They all have large, evergreen leaves adapted to moist climates, yet the desert senna departs from these tropical characteristics with its small and short-lived leaves.

Along this trail you have seen how life can flourish in the desert. To live here requires special adaptations in the roots, leaves, and seeds of plants. The plants found here have developed modifications over a long period of time. Where you find plants you will always find animals, if you just take time to look. Perhaps you saw a side-blotched lizard dart across the path or a red-tailed hawk soaring overhead. Life abounds, and what seems to us to be the most hostile environment can be most hospitable to others.

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*Desert Senna*

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*Arthur Cimino and Frank Watkins*

two gentlemen who loved  
the Cholla Cactus Garden.

## Joshua Tree National Park

