Post 1: Western Mojave

The locale of the Desert Tortoise Research Natural Area usually receives somewhat higher annual rainfall than surrounding areas, resulting in richer and more varied vegetation. In turn, this rich vegetation supports a great variety of desert wildlife species.

Post 2: Desert Tortoise Shell

This is a very old shell of an adult desert tortoise. Notice how the shell degrades as it ages. Remember, as you look for tortoises, that they like the cool of morning for feeding and may be seen walking in the open. When it is hot, tortoises may be found in the shade of a shrub or in a burrow.

Post 3: Desert Washes

Most washes in the Fremont Valley are narrow (three to eight feet wide) and can be called wash "stringers". Washes often have more abundant vegetation than adjacent desert. Certain shrub species favor washes and will grow to heights of three to five feet.

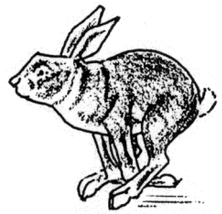
Post 4: Ant Rings

Rings of grasses and forbs may indicate locations of old ant colonies. After the ants have collected and eaten the seeds from the desert plants, the seed cases and husks are disposed around the mound. Seeds that were missed and disposed in this "housecleaning" process germinate the following season and an "ant ring" is formed.

Post 5: Black-tailed Hare

The **black-tailed hare** (*Lepus californicus deserticola*) is most commonly called a jackrabbit. It is perhaps the most frequently observed mammal in the desert. Their numbers fluctuate with rainfall.

With camouflage provided by gray coloring and the habit of staying still or "frozen", a hare can remain unseen by predators. The hare is preyed on by kit foxes, coyotes, eagles, and other predators.

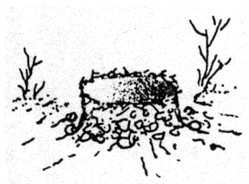


Post 6: Pallet Burrow

Desert tortoises use different kinds of burrows during the year. In Spring, Summer, and Fall, they frequently dig shallow burrows one to three feet in length. These are called pallet burrows. Pallets provide some protection from daily temperature fluctuations and cover from some predators, but are not as effective for protection as the deep winter burrows. A tortoise can excavate a pallet that will cover its shell in about an hour and a half.

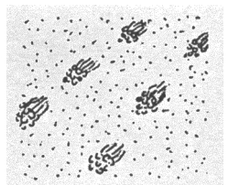
Post 7: Wolf Spider Hole

Look carefully and you may see the home of a desert-dwelling spider called the wolf spider. This spider builds a small turret of gravel, plant debris, and rabbit pellets around the opening of its vertical burrow. It usually hunts at night, lurking in the depths of its vertical turret to rush out on its unsuspecting prey of small insects.



Post 8: Animal Tracks in Washes

Look for impressions in the fine loose soil of the wash before you. In the washes of the desert you may find the footprints of many of the mammal, reptile, and bird species that reside here.



Tortoise footprints are easily distinguished from any of these. The tortoise leaves two rows of evenly spaced, paired footprints.

Post 9: Rodent Holes

The soil underneath creosote bushes is often pocket-marked with animal burrows of different sizes. Generally, the larger holes are occupied by antelope ground squirrels, Mojave ground squirrels, and Merriam kangaroo rats. The smaller rodent holes are made by such species as the long-tailed pocket mouse, little pocket mouse, and grasshopper mouse. Lizards too, excavate burrows in the shelter of shrubs.

Post 10: Desert Tortoise Burrow

A burrow is an ideal home for a desert animal because it provides a way to escape temperature extremes. When the air temperature is 100°F or more, the temperature in a burrow two feet deep can have a temperature of 75° or less. The humidity in the air within the burrow is greater than outside, so an animal resting in a burrow loses less water.

Here the trail turns left

Post 11: Mining Assessment

(15ft out, between two creosote bushes)

There is a widespread mining exploration and assessment activity throughout the Mojave Desert. The mound resulting from digging that you see here is probably due to a mining assessment. Exploration pits, from four to ten feet deep, were common in the Northern part of the Natural Area. Most of them were excavated by prospectors and miners. They can trap unwary tortoises and other animals.

Post 12: Bird Nesting

Sometimes, you will find a bird nest concealed in a thorny bush within a desert wash. Can you think of reasons why birds might choose to nest in bushes with thorns?

Post 13: Predators

Golden eagles nesting in the canyons of the Sierra Nevada Mountains often pick up small tortoises from this part of the desert to feed their young. The desert tortoise is food for a number of predators including snakes, skunks, badgers, desert kit foxes, coyotes, and ravens. Raven predation of young tortoises is of particular concern because raven populations are growing exponentially due to human subsidization.

Post 14: Owl Castings

Owl castings (or pellets) are the regurgitations of hair, fur, or feathers and bone that is not digested by the bird. There are several species of owl found on the Natural Area. Castings are often found at the base of pillars at the Interpretive Center.

Post 15: Desert Woodrat Nest

To your right is a large paper bag bush situated in the middle of the wash. Concealed within is the nest of a **Desert Woodrat** (*Neotoma lepida).* Woodrats (or pack rats) build their nests of a variety of materials such as sticks, stones, animal dung, and other such items. They often share their residence with lizards.

Post 16: Importance of Washes

As previously mentioned, washes are home to many species of plants that require more water. Washes and their abundance of plant life are also commonly used by animals; providing cover from the sun and predators, an abundance of food sources and nesting sites, and a water source during the rainy season.

Post 17: Sidewinder Tracks

The tracks of this snake are readily distinguished in the soft sand of a wash. They appear as a series of parallel "J"-shaped marks. The sidewinder is the most frequently encountered rattlesnake in this desert. It is a comparatively small rattlesnake of 6 to 30 inches in length. The sandy coloring without distinct patterning makes it difficult to see the sidewinder as it frequently coils in a saucer-shaped depression in the soil. Watch carefully for this well camouflaged snake, and for its distinctive tracks in washes.

Post 18: Rabbits Keeping Cool

How does a non-burrowing animal, such as the black-tailed hare, keep cool? Behavior patterns such as being active at night and spending the daytime under rocks and bushes help to decrease loss of body water. Also, blood vessels pump blood out to their large ears which then radiate heat and help to cool down the animal. Unlike some rodents, black-tailed hares cannot survive entirely on dried food, but require some moist food or free water.

Post 19: Tortoise Scats

Scats, or droppings, are important clues to the presence and habits of wildlife. The pointed end of the tortoise scat usually indicates the direction the tortoise was travelling. Scats may remain for several years before disintegrating.

Post 20: Tortoise Bones

Throughout the Natural Area you may see the bleached bones of the tortoise. Sometimes the bones of one individual tortoise may be widely scattered. Researchers can often determine many things about a tortoise from its carcass long after its death, such as the size and approximate age, the sex, and sometimes even the cause of death. What do you suppose may be some of the reasons some skeletal remains are so widely scattered?

Here the trail again angles left

Post 21: Hatchling Shell

The shell of a hatchling doesn't have fully developed bone under the scutes. Until a tortoise is about five years of age, its shell is soft enough to make it very vulnerable to many predators. It is thought that only one to five percent of hatchlings live to adulthood.

Post 22: Water

Water is rarely available to wildlife. Thus, they must be able to drink while they can and conserve it. During infrequent rains, tortoises may excavate a shallow depression on flat bajadas such as this and drink. They also obtain water from green vegetation and the store water in their bladders until moisture is available again. When a tortoise is frightened, it may release the contents of its bladder.

Post 23: Open Flat Area

When out in the open, a jackrabbit, tortoise, squirrel, or lizard could be easy prey for sharp-eyed eagles or hawks flying overhead. Protective coloration and "freezing" are two things that minimize the risk.

Post 24: Golden or Silver Cholla (*Opuntia echinocarpa*)

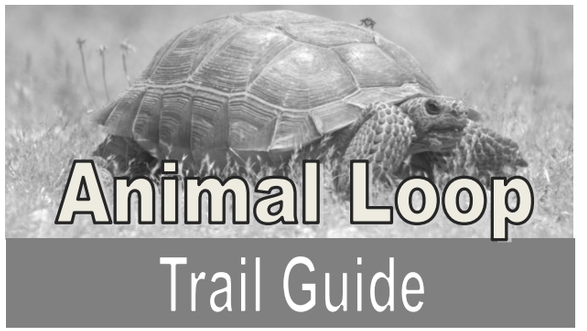
The desert woodrat eats large amounts of the fleshy joints of the silver or golden cholla cactus. It can handle the joints with great skill by moving with agility in and around the cactus, climbing the stems, and dragging joints home to its nest. It can bite the flesh between the spines without getting hurt. If caught by a spine, the rat will easily free itself by biting off the spine.

Post 25: Lizards

Have you seen many lizards during your visit today? They can be seen sitting on creosote bushes, basking in the sun, or sitting in the shade at the base of a bush. Watch for lizards and their tracks in the wash as you return to the main loop.

Trail guide provided by the
Desert Tortoise Preserve Committee
www.tortoise-tracks.org

PLEASE RETURN THIS TRAIL GUIDE TO THE BOX WHEN YOU ARE FINISHED



Animal Loop
Trail Guide

In addition to the desert tortoise (*Gopherus agassizii*), 27 other species of reptiles, 29 species of breeding birds, 23 species of mammals and many species of arthropods live on the Natural Area. Most desert dwellers are well camouflaged. To make the most of your visit:

- MOVE QUIETLY: Noise frightens many of the animals.
- WATCH CAREFULLY: Movement is often a key to the presence of an otherwise hidden animal.
- LISTEN: Some animals make sounds. Birds may sing. Rattlesnakes buzz or "rattle."
- REMEMBER: When it is cool, many animals can be found warming in the sun. As the air and ground become hot, many animals will stay in the shade or in burrows.