

# **Red Fleet State Park Dinosaur Trackway Trail Guide**



# **WELCOME TO RED FLEET STATE PARK DINOSAUR TRACKWAY TRAIL**

This three-mile round-trip hike leads you to dinosaur tracks more than two million years old. The terrain is rocky and in some places sandy, with a lot of ups and downs. Plan on a moderate to strenuous hike depending on your ability. Bring along plenty of water and snacks.

The best viewing of the dinosaur tracks is in early morning or late afternoon. The sun makes them difficult to see mid-day. Brown markers and black dinosaur tracks painted on the rocks mark the trail. The numbered posts correspond with this guide and points of interest.

Enjoy the trail and take the time to hear the sounds of nature. Please help keep this trail clean by packing out your garbage.

## **1. RABBITBRUSH** **(*Chrysothamnus sp.*)**

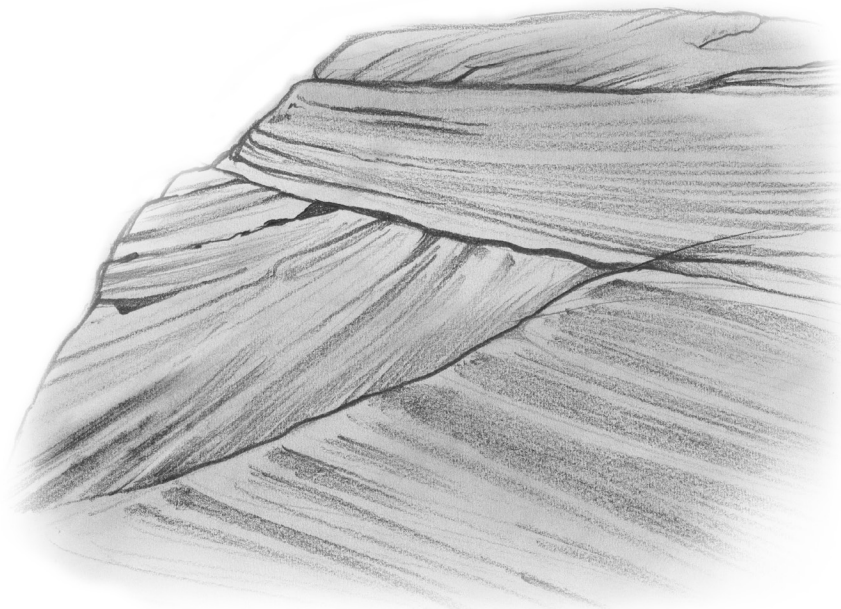
The generic name of rabbitbrush, *Chrysothamnus*, quite literally translates into golden shrub, an apt description of the plant in the late summer months when the desert glows with its bright yellow flowers. This hardy shrub of the sunflower family can grow easily in disturbed areas, thrives in alkaline and clay soils, and tolerates even the worst drought conditions. Although somewhat tasty to wildlife, it is poor feed for livestock and clearly indicates overgrazing where thick stands occur.

American Indians used rabbitbrush for a variety of purposes including yellow dye, tea, and cough syrup. They also made a kind of chewing gum from the roots.

## **2. UTAH JUNIPER TREES** **(*Juniperus osteosperma*)**

These trees are common in the high desert. They are well-adapted to the extremes in climate, from below zero temperatures in the winter to more than 100 degrees Fahrenheit in the summer. They are critical components of animal habitat, providing shade, nesting areas and a ready food source in their berries.

Used by the American Indians as well, the bark was peeled and used for sleeping mats, shredded for absorbent material in cradleboards, and even used to make sandals.



### **3. NUGGET SANDSTONE**

Nugget Sandstone, reminiscent of the modern-day Sahara Desert, was formed by ancient eolian sand dunes approximately 210 to 180 million years ago. Note the cross bedding in the pale tan, yellow and red rock, formed by wind before the dunes were lithified or hardened.

Traditionally Nugget Sandstone was thought to contain very few fossils; however, recent discoveries of tracks and bones show that early dinosaurs and other animals inhabited the small ephemeral lakes situated among the dunes.

## 4. NATIVE WILDFLOWERS

Yes, the desert does bloom. Beginning in the early spring, immediately following snowmelt, and continuing through late autumn, wildflowers provide a startling contrast to the olive green, gray and brown of desert shrubs and trees. Small carpets of white or pink flowered phlox start the season, followed by a succession of deep purple larkspur, bright blue penstemon and the light purple lupine.

As the summer progresses, one can see the yellow petals of the western wallflower, the pink and yellow blossoms of the prickly pear cactus, and the stunning magenta blooms of the claret cup cactus. Sunflowers, lavender tansy aster and rabbitbrush, with its brilliant gold flowers, bring the blooming season to a close in late summer and early autumn.

As you walk this trail, see how many different flowers you can find.





## **5. FOUR-WING SALTBUUSH** **(*Atriplex canescens*)**

This hardy desert plant is very drought tolerant and can grow in a variety of harsh soil conditions, including alkali and saline. The plant is a valuable source of winter forage for deer and elk, while the fruit provides a ready food source for many animals throughout the year. American Indians ground the seeds to make bread.

This plant is a member of the *Chenopod*, or goosefoot, family and is only one of the several species of *Atriplex* that thrive in the desert. The plant is dioecious, meaning male and female flowers are borne on separate plants, leaving it dependent on the wind for pollination.

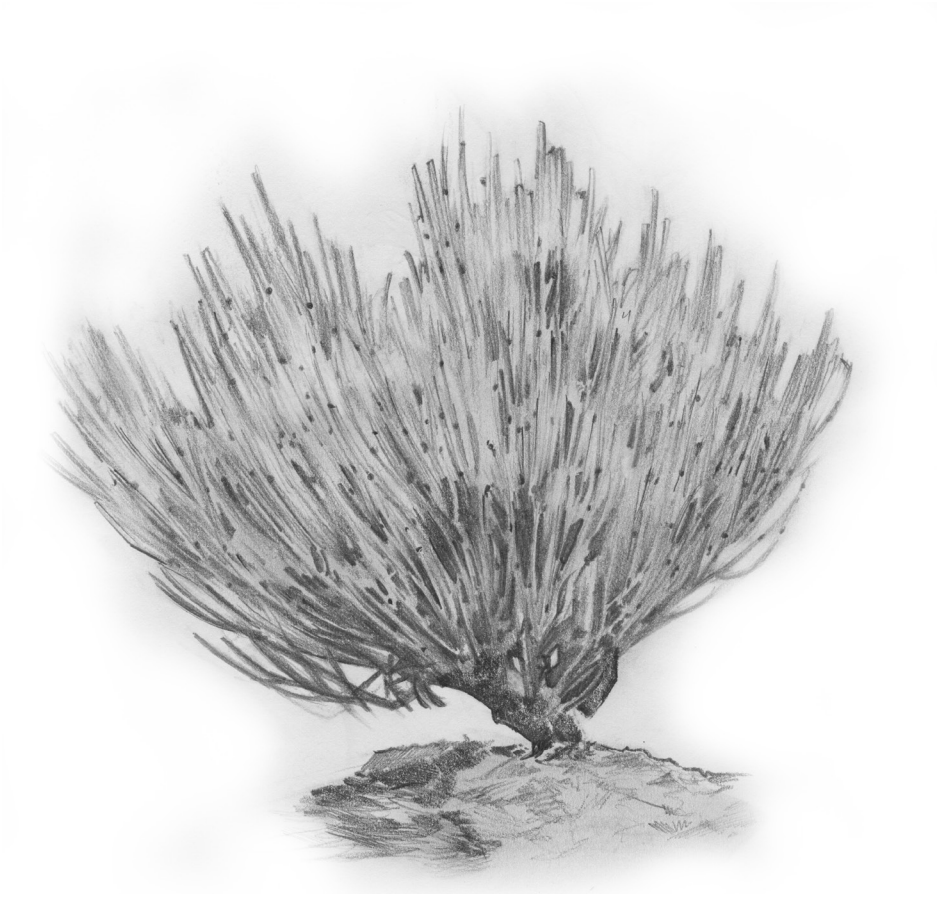
## **6. DECAYING JUNIPER**

### ***(Juniperus)***

Decay, or the recycling of nutrients, is a vital part of nature. This decaying juniper provides a home for burrowing insects and a habitat for small mammals and birds, such as chipmunks, lizards and woodpeckers. Decaying trees are such an important part of a healthy forest ecosystem that land managers leave a specified number of dead trees, known as snags, within the forest community.

## **7. MICROBIOTIC SOIL**

If you look around and see what appears as a frothy black frosting with thousands of miniature towers and ridges coating the ground, then you have found “hidden life.” These towers and ridges are part of a whole community of microscopic life that includes fungi, photosynthetic bacteria, lichen, moss and other living organisms. Without this living crust to stabilize the soil and provide nutrients and moisture, it would be virtually impossible for other plants to establish within this desert ecosystem. Incredibly fragile, this soil is highly susceptible to trampling by livestock and human activities, taking upwards of 30 to 85 years to reestablish if is damaged.



## 8. EPHEDRA or MORMON TEA

The early Mormon pioneers used this plant for making tea, hence the other names Brigham Tea and Mormon Tea. Both pioneers and American Indians used this herbal remedy to treat the common cold, asthma and hay fever. None of the North American species of *Ephedra* contain any, or enough, of the alkaloids necessary to produce the drug ephedrine, which is derived from a European species. Photosynthesis occurs in the stems of the *Ephedra* plant, rather than the tiny, reduced leaves.

## 9. CACTUS-PRICKLY PEAR (*Opuntia polycantha*)

Prickly pears belong to the cactus family, a group of succulent plants that originated in North America. The term “prickly pear” refers to the spiny, pear-shaped fruit of the plant. The spines on the stems or pads are actually modified leaves. As in the *Ephedra* plant, the photosynthesis takes place in the fleshy stems. Cacti thrive in the desert environment by storing water within the stems. Notice after a rainstorm that the stem is plump with moisture, but as the dry summer progresses, it becomes increasingly shriveled as the stored water is used. This strategy comes with a cost, as many desert animals find the moisture-plump stems delicious.

Beautiful magenta or yellow blooms decorate the plant during the late spring and early summer.

## **10. MOSSES AND LICHENS**

Why do the rocks have spots? These spots on the rocks are lichens and mosses. Lichens are a symbiotic relationship that pairs cyanobacteria or algae with fungi. The algae or cyanobacteria provide food through photosynthesis, while the fungi provide structure and moisture. This helps establish a living ecosystem on the once barren sandstone and is the beginning of plant succession. Over time this organic material produced by the lichens accumulates and provides a foothold for the spores of mosses. Mosses, in turn, act as natural sponges, furthering the succession process by providing moisture and additional organic material, and so the process continues, eventually allowing the establishment of even larger plants.

## **11. DESERT ANIMALS**

The desert is home to many mammals, birds, insects and other creatures. Though you may not see them, their tracks are often visible in the sand, clear indication of their presence within the desert ecosystem. Certain adaptations, some morphological (physical) others behavioral, allow them to thrive in the harsh climate. The long ears of the jackrabbit not only help it hear predators, but act as radiators of excess heat. Other desert dwellers, such as the scorpion and packrat, are nocturnal, or active during the cool night temperatures.

Here are some of the animals you may see as you hike the trail:

The black-tailed jackrabbit stays the same color year-round (grey), while the white-tailed jackrabbit changes to white in the winter. Note the large ears and long limbs, making jackrabbits easily distinguishable from the smaller cottontail rabbit.



Cottontail rabbits also inhabit the area. They are a common food source for many mammals and birds of prey, such as eagles, hawks, falcons and owls. Each year a single female rabbit will produce several litters.



Lizards: The desert holds many species of lizards. Look for them in the shade of rock crevices or scuttling in the sand from one shelter to another. A common species found within the Uinta Basin is the sagebrush lizard.

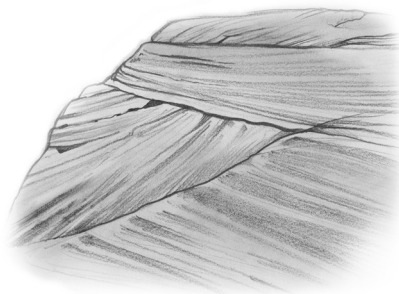


Keep a sharp eye out for mule deer. Although you may not see one directly, note their tracks and scat along the trail. Does (female deer) give birth to one or two fawns during late spring. Virtually scentless at birth, the fawns remain hidden from desert predators such as coyotes, bobcats, mountain lions and even eagles.

Wood rats (packrats): As you hike along the Nugget Sandstone cliffs, look for signs of the bushy-tailed woodrat in overhangs and crevices. Although you are not likely to actually see one, signs of their presence will include piles of twigs, rocks, parts of cactus, fecal pellets and the characteristic tar-like urine which acts as a cement to hold the structure together. These packrat middens are so durable some have been dated up to 50,000 years old and have been used in the study of climate change.

## **12. DESERT VARNISH**

Along the trail you may notice dark stripes running down the sides of the steep sandstone cliffs. Known as desert varnish, these stained areas add a vibrant contrast to the beauty of the red and yellow sandstone. Desert varnish is made when a source of moisture, such as a rainstorm or snowmelt, flows over the cliff face and provides a micro-habitat for airborne bacteria. The bacteria affix to the wet sandstone and begin to metabolize minerals, which after many years produces the black staining. Indigenous people used the varnish to accentuate their rock art by pecking away the dark stain to reveal the light-colored sandstone below.



## 13. NATIVE BUNCH GRASSES

Native bunch grasses grow in clumps or bunches. They vary in size from eight-inch tall curly grass (*Hilaria*), to the two-foot tall, lacy-headed Indian rice grass (*Oryzopsis*), to the six-foot tall giant rye grass (*Elymus*).

Bunch grasses play an important role in the desert ecosystem. They help hold the dry sandy soils together and provide important forage for wild and domestic animals.

## 14. VIEW OF RED FLEET

From here, you can see the geologic formations that give Red Fleet State Park its name. The lower portion or bow of the “ships” consists of the Late Triassic Chinle Formation, deposited by ancient rivers 225 million years ago (mya). The upper portion or “turret” is formed by the Nugget Sandstone, eolian sand dunes formed around 210 to 180 mya. As you look at the red rock formations, it is not difficult to imagine a fleet of ships sailing off toward the northwest.



## **15. SAGEBRUSH**

### **(*Artemisia sp.*)**

Several species of sagebrush grow in this part of the high desert, from low growing ground cover to large shrubs. Some are easily identified by their namesake aromatic scent, while others have virtually no smell at all. However variable they are in appearance and aroma, all of them have common adaptations which allow them to colonize the cold desert. One example of this is their advantageous root systems. The sagebrush has both a substantial taproot, from three to 13 feet long, and a series of secondary roots just under the soil, which allow it to soak up even the smallest amount of moisture provided by a short summer sprinkle.

If you look at the leaves closely you will see small hairs designed to help the plant reduce evaporation by providing both shade and deflection of air movement across the leaf surface.

Certain species of sagebrush are an important food source for both livestock and wildlife, as well as providing cover and shade during both the cold winter months and the hot days of summer.

## **16. BIG BRUSH CREEK**

Though only 25 miles long, Big Brush Creek accomplishes more in that short distance than most big rivers. It starts high in the eastern Uinta Mountains and flows into Oaks Park Reservoir where some of it is held for irrigation releases later in the summer. From there it drops through Brush Creek Gorge. On the way through the gorge, it has carved out a limestone cave complete with stalagmites and stalactites.

Leaving the gorge, it gives up some of its water to help process the phosphate that is mined from the Park City Formation. Next it flows into Red Fleet Reservoir, winding through 200-foot-deep canyons of red Nugget Sandstone before it enters the reservoir.

Red Fleet Reservoir holds back much of the creek's water, releasing it slowly throughout the summer months to provide water for the thirsty fields and residents of Ashley Valley.

Below Red Fleet, Big Brush Creek joins with Little Brush Creek. The conjoined streams help irrigate the many alfalfa fields in the valley. Just north of Jensen, Utah, Brush Creek ends its journey by flowing into the Green River on its way to start a new adventure.

## 17. DINOSAUR TRACKWAY

There are three signs ahead to help you discover the tracks and provide more information about them. A single imprint is called a track, while two or more in a row from the same dinosaur is a trackway. Several hundred tracks named both *Grallator* and *Eubrontes* species are located here. *Grallator* is attributed to a small three-toed theropod (meat eater), whereas *Eubrontes* tracks likely represent at least two types of dinosaurs: one a large theropod, possibly *Dilophosaurus*, and the other a prosauropod (early plant eater).

These tracks and trackways were formed as dinosaurs walked in wadi deposits (ephemeral river beds) or at the edge of a small lake situated among the sand dunes more than 200 million years ago.

State and federal laws protect fossil tracks. Help us keep this site open for everyone to see and enjoy for many generations to come. DO NOT lift, pry or throw any rocks at this site, and report anyone doing damage. Cliff jumping is not permitted at Red Fleet State Park.

**Special Note:** Spring and early summer bring high water to the reservoir, submerging many of the tracks. If you are visiting during this time, some tracks are still visible in the shallow water and along the shoreline. Late summer, fall and early spring are the best times to visit the site for the greatest number of exposed tracks. The best time of day to view tracks is during periods of low light, such as early morning or evening.

**Your park fees provide for the care, protection and enhancement of this park.**

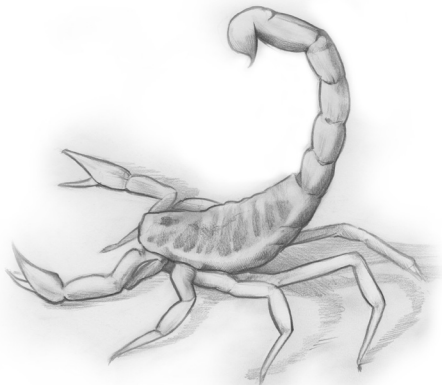
**Utah State Parks Mission:**

To enhance the quality of life by preserving and providing natural, cultural and recreational resources for the enjoyment, education and inspiration of this and future generations.

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*Dilophosaurus*