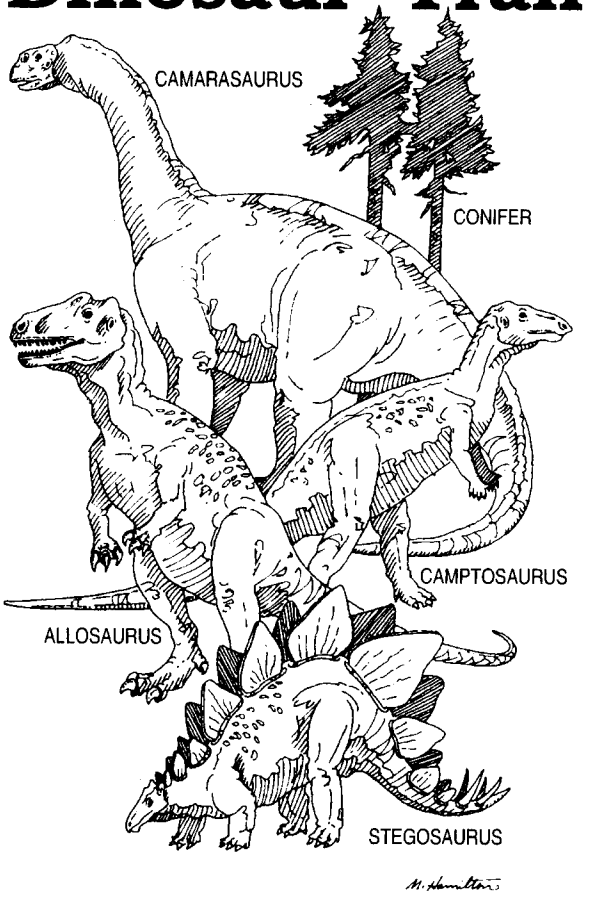
BUREAU OF LAND MANAGEMENT

MILL CANYON

Dinosaur Trail



A SELF GUIDED WALKING TOUR

Grand Resource Area - Moab, Utah

General Overview

The dry climate and eroded landscape of today is very different from the environment that existed when the dinosaurs roamed southern Utah. Climates were mild and moist during the Jurassic period 150 million years ago. The fossil remains of plant and numerous dinosaurs are typically found in the Morrison Formation. The Morrison Formation is a complex series of clays, shales, and sandstones that settled in swamps, bogs, shallow lakes, and the broad and often slow moving streams that wandered over a low-lying featureless landscape. Cycads, ginkgoes, and conifers formed forests, shading an undergrowth comprised largely of ferns. Horsetails and succulent plants grew abundantly in swamps and bogs. The Morrison Formation contains the fossil remains of plants and numerous kind of dinosaurs including: Allosaurus, Camptosaurus, Stegosaurus, and Camarasaurus.

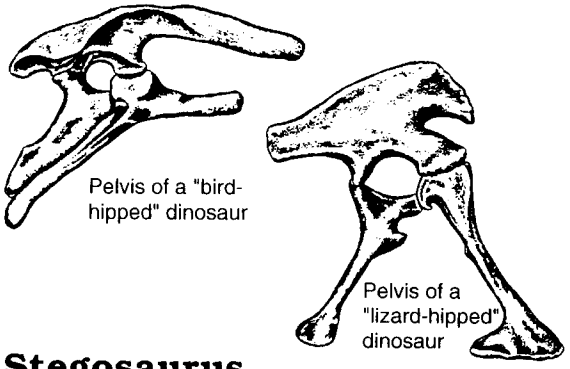
Jurassic rocks are exposed over wide areas in eastern and southern Utah. Their multicolored layers provide a scenic wonderland. Water deposited and wind blown sands and silts comprise these formations. They include the Navajo sandstone which overlays the late Triassic Kayenta and Wingate sandstones, and The Entrada sandstone that is seen in the majestic formations of Arches National Park.

Fossilization

An essential requirement for the formation of a fossil is rapid burial by sediment after the organism dies and the soft tissue rots away, leaving the bony skeleton. This burial normally occurs in rivers, lakes, or the sea into which the carcasses of land-living animals may be washed. Two processes may then occur: (1) permineralization, where organic matter in the bones may decay and be replaced by minerals from water percolating through the sedimentary rocks; or (2) petrifaction, the bony structure may be replaced entirely by minerals. Alternatively, the bones may dissolve, leaving a hollow mold that may be filed by minerals that form a solid replica of the bone, a natural cast. Land movement and erosion may then lead to exposure of the fossil.

Allosaurus

Allosaurus was a large, bipedal, saurischian (lizard-hipped), meat-eating dinosaur. Heavily built, Allosaurus had powerful hind legs, relatively short but strong forelimbs, and a very large head. A massive tail must have aided in balance. The animal grew to a length of nearly 39 feet. The huge jaws were lined with large serrated, stabbing, and cutting teeth. Both hands and feet were equipped with large claws.



Stegosaurus

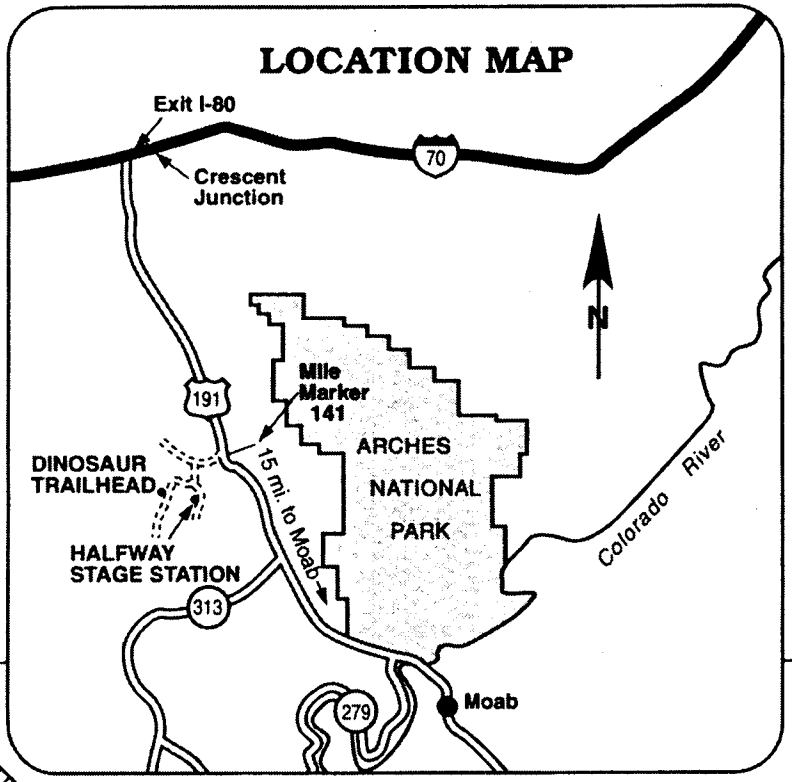
Stegosaurus was a moderately large four-footed, ornithischian (bird-hipped), plant eating dinosaur, which is characterized by a double row of large, alternately spaced plates that ran down its back and large spikes at the end of its tail. The animal grew to a length of 25 feet and may have weighed 1.5 tons. Stegosaurus had an extraordinarily small brain, which weighed no more than 2.5 to 2.8 ounces.

Camarasaurus

Camarasaurus was a very large, heavy bodied, four-footed, saurischian (lizard-hipped), plant-eating dinosaur. It had a short skull with a blunt snout and a fairly long neck and tail. Camarasaurus grew to a length of 59 feet and the four pillar-like legs may have supported a weight of nearly 20 tons.

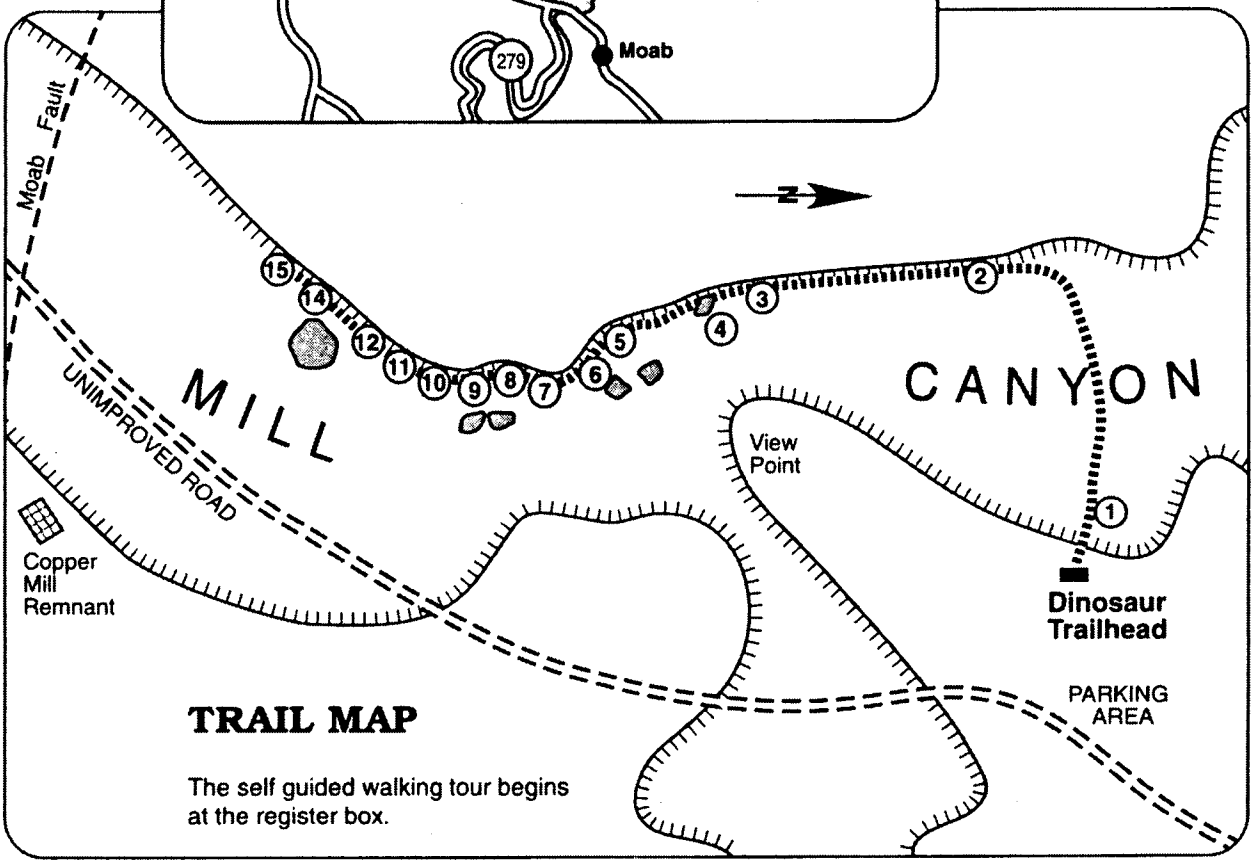
Camptosaurus

Camptosaurus was a moderately sized, ornithischian (bird-hipped), plant eating dinosaur, which was presumably quite nimble and fast, but otherwise quite defenseless. The animal grew to a length of around 20 feet. Hoof-like claws on both fingers and toes suggest that it often walked on all-fours.



Access

To reach the Mill Canyon Dinosaur Trailhead, drive 15 miles north of Moab on U.S. 191, then turn left at an intersection just north of highway mile marker 141. Cross the railroad tracks and continue 2 miles on a bladed dirt road to the Dinosaur Trailhead. The road is impassible when wet.



TRAIL MAP

The self guided walking tour begins at the register box.

Trail Sites

(1) Anterior dorsal vertebra and neural arch fragments of a sauropod dinosaur, perhaps Camarasaurus.

(2) Long bones of the right hind limb of a sauropod, including a femur (thigh) and lower leg elements, the tibia and fibula. The hind foot is not in evidence, however.

(3) Foot elements of a sauropod, perhaps including metacarpals and phalanges (toe bones), and a small dorsal vertebra below.

(4) In place to the right or upside of the trail are partial sauropod vertebrae and various fragments of other unidentified bones. On the lower side of the trail are numerous bone fragments in several blocks which have separated from the outcrop. Can you match any of the bone fragments on one block with another?

(5) Natural molds or impressions of a small and large caudal (tail) vertebra of a sauropod.

(6) In the block where the trail crosses the wash are numerous bones. How many individual bones can you count? Please avoid areas near the unstable cliffs to the right (upside of the hill).

(7) Distal (toward an end) caudal (tail) vertebrae of an unidentified sauropod with parts of four haemal arches (chevron bones) remaining as the only evidence of vandalized vertebrae in the series. Above and to the right about 2.5 meters (7 feet) is the protruding end of a sauropod femur (thigh). Above and to the left about 2 meters (6 feet) is the natural mold of a sauropod pelvic element that has been weathered out or carried away. Below and to the left is a very large boulder with numerous sauropod limb elements in evidence. There are femora, a tibia, and pelvic pieces in view.

(8) Incomplete scapula and ribs of an unidentified sauropod. There appears to be the proximal (toward the body) end of a humerus, coracoid, or femur to the left.

(9) A variety of separate bones are shown including the proximal end of a sauropod fibula, a section of allosaurid femur, a section of camptosaurid femur, the chevron or back part of the neural lodge and neural spine of a stegosaurid, a possible vertebrae and miscellaneous unidentified element fragments.

(10) Vandalized sauropod tibia with only the impression or natural mold of the original bone left in place.

(11) Bones prepared in place by an experienced paleontologist.

(12) Packrat midden. Packrats collect everything within 200 yards of their den. Over the years many layers build up within the den. These layers, which are studied by scientists, are good time and climate indicators.

(13) Numerous hind leg elements of Allosaurus including a femur, tibia, fibula, metatarsal, and phalanges.

(14) Disseminated (scattered) fragments of fossil wood.

(15) Fossil wood area with prominent mold containing a horizontal remnant of a large trunk of an araucaria-like tree (cone-bearing pine - "conifer"). See the counterpart of the tree trunk in the large boulder complex on the down side of the trail.

This is the trail termination, so you may choose to retrace your steps or hike across the canyon to the south and visit the copper mill site.

Mill Canyon (THE OLD COPPER MILL)

On the south side of the canyon you can view the remnants of an old copper mill. Copper ores (azurite and malachite), exposed along the Moab fault, were mined and processed here in the late 1800's. Limited quantities of ore and fluctuating prices probably made the venture economically unfeasible and the mill was abandoned.

The Mill Canyon Dinosaur Trail is a bold experiment; there are no guards or fences here. You, the visitor, are the protector of this valuable resource. It is illegal to remove, deface, or destroy improvements, rocks, and fossils.

Halfway Stage Station

The remains of the Halfway Stage Station are located east of the Dinosaur Trail. The Halfway Stage Station served the traveling public between Moab and the railroad at Thompson. The first passenger train went through Thompson to Salt Lake in April of 1883. The railroad was 35 miles from Moab. The trip from Moab to the train took eight hours for passengers, so travelers stopped at the station for lunch. Slower freighters spent the night on a two day trip. To reach the stage station proceed north toward Highway 191. At the first intersection turn right and proceed to a dry wash. Turn right on the jeep trail at the wash crossing and continue to the Stage Station.

Other Paleontological points of interest include:

Cleveland-Lloyd Dinosaur Quarry - near Price, Utah
Dinosaur National Monument - near Jensen, Utah
Dinosaur Valley Museum - Grand Junction, Colorado
Utah Museum of Natural History - Salt Lake City, Utah
College of Eastern Utah Prehistoric Museum - Price, Utah
Utah Fieldhouse of Natural History - Vernal, Utah
Trail Through Time (Rabbit Valley) - I-70 at the Utah/Colorado stateline.

FOR MORE INFORMATION

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