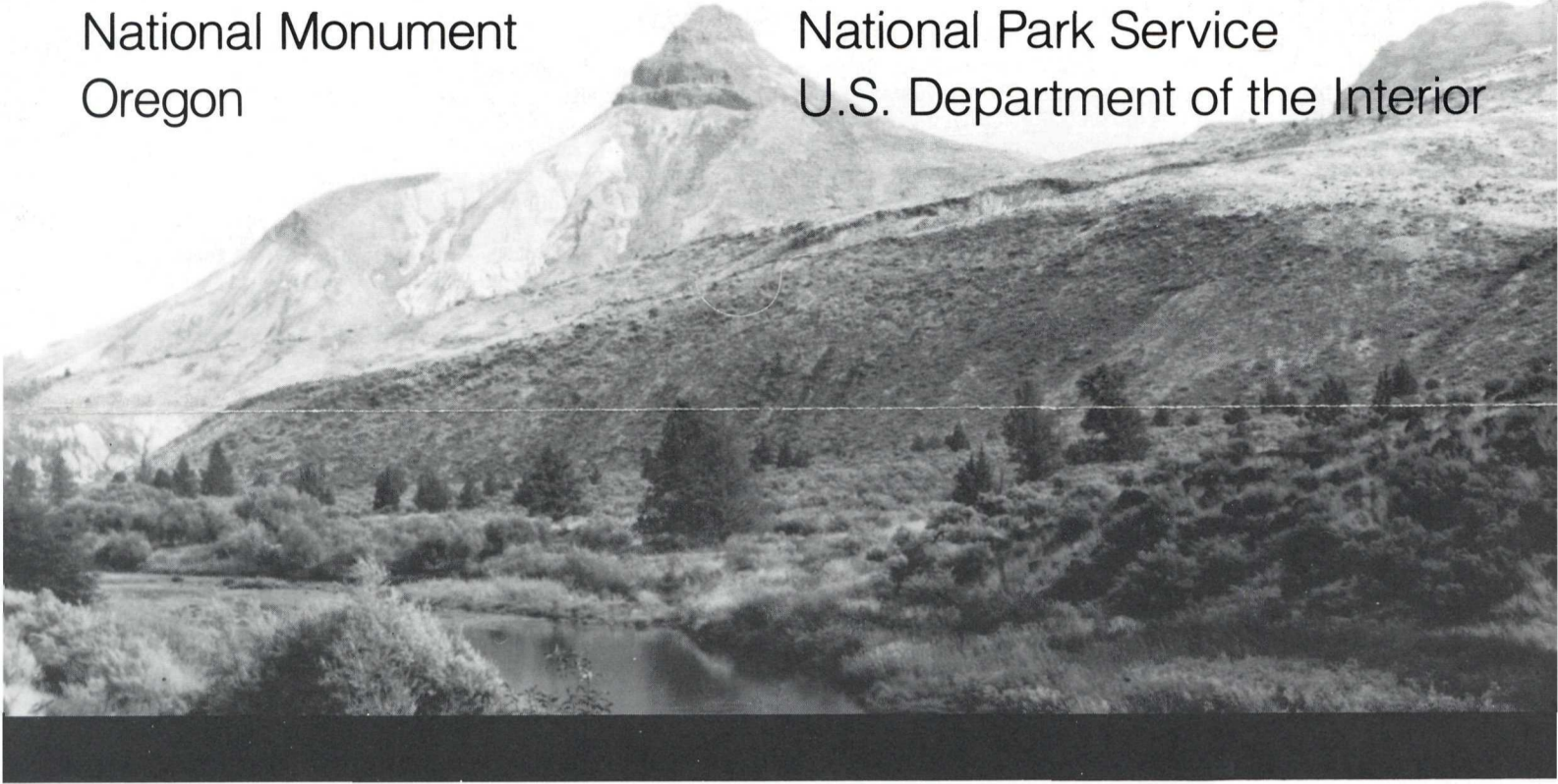


# John Day Fossil Beds

National Monument  
Oregon

National Park Service  
U.S. Department of the Interior



## A Land Rich With Life

John Day Fossil Beds offer you the closest thing to a time machine, a chance to use your imagination to visit the evolutionary past. A tour of the park takes you steadily backward in time, as you explore the vestiges of life which remain within its picturesque formations.

A major part of the record of the Age of Mammals—the last 40 million years of it—derives from this locality. It is truly an archive of ancient life, only a fraction of whose treasures have been removed for scientific study. You are able, with a little imagination, to move along with scientists into these worlds of the past and envision the life of millions of years ago.

For tens of thousands of years native peoples roamed this land, hunting and fishing among its streams and mountains. In 1812, a pioneer Virginian explorer and trapper, John Day, passed nearby with the Overland Expedition of the Pacific Fur Company. Although his travels near this country were brief, for he was on his way to the mouth of the Columbia River, his name has remained.

Gold was discovered in the John Day country in the 1860s, causing a minor gold rush. But even before the discovery of gold, other pioneers came to mine, farm, and cut timber. Among the newcomers

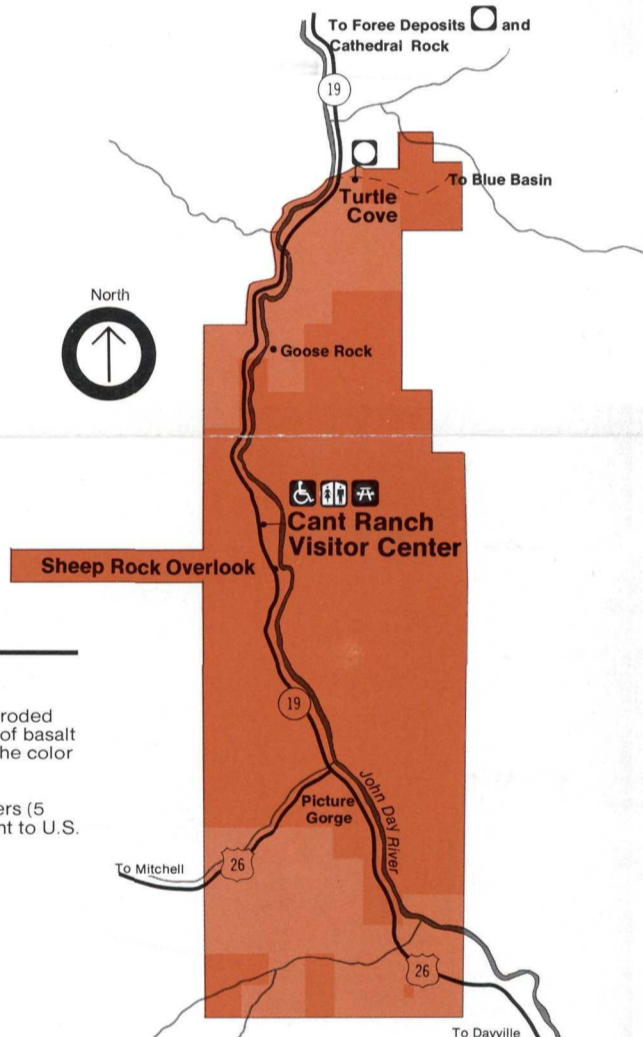
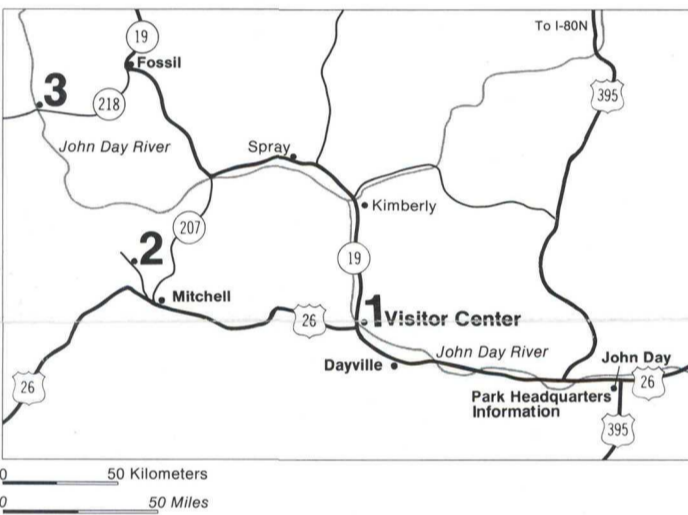
was a man who had emigrated to The Dalles, Oregon, from New York in 1852, a pioneer minister who was also an avid student of paleontology and evolution. Unlike most of his contemporaries, Thomas Condon saw no conflict between his religious views and the revelations of science then coming into prominence.

To protect the natural and fossil resources of the area, the State of Oregon began in the 1930s to purchase several of the outstanding fossil beds for use as state parks. Congress recognized the national significance of the fossil beds in 1974 by authorizing establishment of John Day Fossil Beds National Monument. The park now totals more than 5,800 hectares (14,030 acres) of land, including the important fossil beds and surrounding lands, a scenic landscape of scattered juniper trees, sagebrush, and bunchgrass. Cottonwoods and willows line the streams at the lower elevations, while in the nearby Strawberry, Aldrich, and Ochoco mountain ranges grow forests of Douglas-fir, true fir, larch, and pine.

Today, tourism is a major aspect of life in the John Day Valley, as are cattle ranching and lumbering. And today, scientists and students continue the tradition established by Thomas Condon of studying the evidence of the past at John Day Fossil Beds.

## Visiting the Park

The map below shows the location of each of the three separate sections of the park. The numbers suggest a logical tour sequence.



### 1 Sheep Rock

**Cant Ranch** The former main ranch house serves as a visitor facility. Inside are exhibits on geology and local ranching history. Outside, you can walk about the grounds or picnic in the cool shade. You should be able to see the John Day River from the roadside. A short trail to the **Sheeprock Overlook** begins here, 170 meters (200 yards) long. *Wayside exhibits.*

**Turtle Cove** Two trails diverge from the parking lot: Go to the north on a trail of 480 meters (one quarter mile) to see the base of the rock formations; take the other trail about 500 meters to visit the cove itself. Note the changing colors as light plays on these formations. *Wayside exhibits.*

**Cathedral Rock** This colorful and interesting rock formation is a remnant of an ancient landslide.

**Foree Deposits** Note the picturesque eroded face of the Columbia lava flows, a series of basalt lava flows that surround this area. Here the color green is predominant. *Wayside exhibit.*

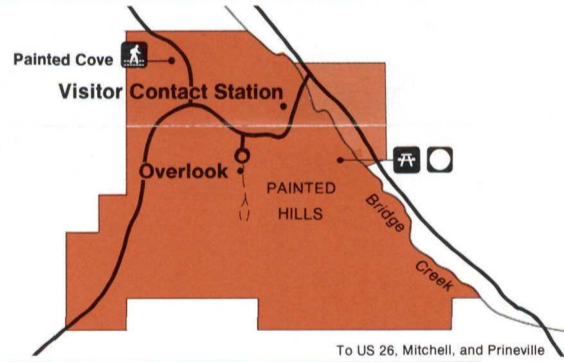
**Access** Sheep Rock unit lies 8 kilometers (5 miles) west of the city of Dayville adjacent to U.S. 26 and Ore. 19.

### 2 Painted Hills

**John Day Formation Overlook** Note the buff and red colors of the eroded landscape, part of the John Day geological formation. To the east is Sutton Mountain, where ancient lava flows include shades of red, pink, buff, gold, bronze, and black. Moisture intensifies the colors of the eroded volcanic ash. There is a 0.8 kilometer (0.5 mile) trail to the south from the overlook. *Wayside exhibits.*

**Painted Cove Trail** A loop trail of 170 meters (200 yards) is open for your enjoyment of the scenic geological formations. Drive west 1 kilometer (0.7 mile) from the junction of the spur county road and the overlook, then north on another spur road. Go 0.6 kilometer (0.4 mile) to a parking lot on the west side of the road, where the loop trail begins.

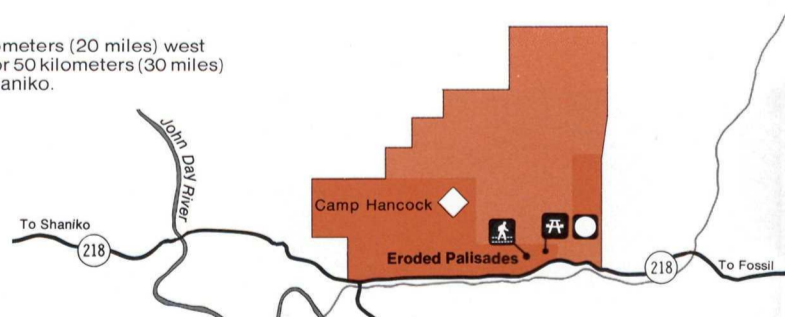
**Access** Painted Hills unit lies 9.5 kilometers (6 miles) along a marked county road northwest from U.S. 26 west of Mitchell.



### 3 Clarno

**Eroded Palisades** Eroded ancient mudslides are the principal geologic feature at Clarno. Note the brown and bronze colors of the rock formation. Here, as elsewhere in the park, you should take time to experience the subtle changes of color, light, and shadow among the rock formations. Your photographic skills can be both challenged and sharpened here, as you explore the nuances of the terrain. Remember to wear sturdy shoes and to watch for snakes if you move away from the developed area. Take water with you if you plan to hike any distance. No water is available here. *Wayside exhibits.*

**Access** Clarno is 30 kilometers (20 miles) west on Ore. 218 from Fossil, or 50 kilometers (30 miles) east on Ore. 218 from Shaniko.



Private property exists within the authorized boundary of John Day Fossil Beds NM. Please respect private property rights.

Scale for park maps  
0 1 Kilometer  
0 1 Mile

- Parkland
- Private property
- Trail
- Self-guiding trail
- Handicap access
- Restrooms
- Pit toilets
- Picnic area

## General Information

**Camping** Ask the staff for information on the campgrounds maintained in the region. Current camping information is posted in each unit of the park.

**Other Accommodations** Lodging, food, fuel, and public telephone services are available in nearby communities (see map above) but not within the park.

**Transportation** Limited commercial bus service is available in the region. A small-aircraft airport serves the city of John Day.

**Things to See and Do** Ask the staff for information about loop drives, unimproved trails, museums, and fishing and wildlife observing opportunities.

**Park Headquarters** Located in the city of John Day, the park's headquarters provides orientation information and a display of fossil replicas identical to those found in the park. Publications on the history and natural history of the area are on sale here. The mailing address is 420 W. Main, John Day, Oregon 97845.

**Regulations** The park was established to preserve a heritage of the past for present and future generations to enjoy and learn from. *Scientific and educational research is allowed with appropriate permits, but individual fossil collecting or digging is prohibited.* Please be considerate and ask a member of the staff if you need further information.

Off-road vehicles are prohibited. Do not stray from the established trails, and do not climb on the rocks as it is dangerous to do so in any weather. The park is a wildlife refuge. Fishing is permitted with an Oregon State fishing license, but all hunting or other use of firearms is strictly prohibited on Federal lands within the park. Keep pets under your physical control at all times. Please be careful with all fires and cigarettes, as grass fires are a constant hazard. Public and private lands are not fenced or marked, so please respect property rights and use the trails wherever possible. Avoid grazing animals and keep your pets away from them for the safety and welfare of all concerned. Remember that water is available only at the Cant Ranch visitor center and at park headquarters. Ask a member of the staff for help or information if you are in doubt.

# John Day Fossil Beds

## Time and Fossils

The immensity of time came as a shock to everyone; even the scientists who worked it out were astounded to learn how old the Earth is. We now believe that our planet is nearly 5 billion years old, and that it has had life on it for more than 3.5 billion years. A century ago, Reverend Thomas Condon and many of his contemporaries were in the forefront of documenting and reconstructing the Earth's past, particularly the life of the most recent 70 million years. Here at John Day Fossil Beds they studied one of the truly outstanding continuous sequences of mammalian fossils—including a unique, uninterrupted fossil record seven million years long.

Try to imagine Thomas Condon's joy and fascination with these clues to the past; imagine that you are looking over his shoulder as he excavates fossils or as he attempts to reconstruct an ancient mammal

from fossil bones retrieved from the rock after days or weeks of painstaking effort. The wealth of fossil material here attracted the notice of other paleontologists, notably the famous rivals Othniel C. Marsh and Edward D. Cope, as well as Joseph Le Conte, John C. Merriam, and Ralph W. Chaney. Specimens collected by them are now part of major university and museum collections, and scientists are still working to reconstruct extinct animals from these remains.

As you enjoy the scenic beauty of John Day Fossil Beds National Monument, take time to contemplate the great age of the land, and the many changes it and the life upon it have undergone. How will this land change in the future? The answer may lie in the study of the slow but dramatic changes of the past.

## The Geological Sequence

The diagram to the right is a schematic guide to the local geological formations, with the youngest on top and the oldest on the bottom. On the left are listed the names of geological epochs; in the center are the ages in millions of years; and to the right are the names of the formations. The paleontological reconstruction paintings below follow this same order, descending from youngest to oldest.

Cenozoic Age of Mammals	Holocene	10,000 years ago	Landslides
	Pleistocene	3 million years ago	Rattlesnake Formation
	Pliocene	12 million years ago	Mascall Formation
	Miocene	25 million years ago	Picture Gorge Basalt
	Oligocene	40 million years ago	John Day Formation
	Eocene	60 million years ago	Clarno Formation
Mesozoic Age of Reptiles	Cretaceous		Goose Rock Conglomerate



## Sheep Rock

25 million years ago the epoch we know as the Oligocene was ending. The John Day country had active volcanoes at this time, as shown in the scene above. Fossil leaves found elsewhere in the John Day Formation suggest a warm, temperate-climate forest, with birch, oak, sweetgum, chestnut, and beech trees, as well as an ancient form of the redwood tree. The important fossils at Sheep Rock are those of the animals, among which are the remains of the small **oreodont** (1), about the size of a pig or sheep. Oreodonts probably grazed in herds and may have evolved several different adaptive patterns, including tree-climbing and a semi-aquatic life-style. A group of four oreodonts in the scene above is being

attacked by a **saber-tooth cat** (2), while **Miohippus** (3), an early form of the horse, flees. Beyond are two **entelodonts** (4), large pig-like animals. Two **diceratheres** (5), an early form of rhinoceros, are shown grazing placidly. The small creature in the right foreground is **Hypertragulus** (6). **Miohippus** was a smaller and earlier form of *Equus*, the contemporary horse of our evolutionary moment.



## Painted Hills

In the west of 30 million years ago, the climate was slowly changing from a subtropical one to a more temperate climate. Volcanic eruptions showered ash on the landscape, accumulating in layers that reached a depth of more than 300 meters (1,000 feet) in the course of many millions of years. Eventually the ash hardened into a shaly rock, which you see exposed today in sections of the vast John Day geological formation at Painted Hills, Sheep Rock, Cathedral Rock, and elsewhere. Fossil leaves found in large quantities at Painted Hills are the major keys to the prevailing climate of the time. In the painting above, you see an **oreodont** (1) grazing, surrounded by the forest growth of the time. In the

left foreground is a tree of the species **Quercus consimilis** (2), an early form of oak. In the right foreground is **Umbellularia** (3), a form of laurel, while **Metasequoia occidentalis** (4), an early redwood, can be seen in the left background. In the right background is the alder **Alnus carpinoides** (5). Among the animals which would have been present, but which are not shown, are the pig-like entelodont and some small seed-eating rodents.



## Clarno

The climate of 40 million years ago in the John Day country was utterly unlike today's semi-arid climate and more like the sub-tropical climate of countries such as India or Sri Lanka. Petrified wood, fossilized leaf imprints, and fossilized seeds indicate a sub-tropical forest of palm, fig, cinnamon, catalpa, avocado, cycad, tree ferns, and many other plants that flourish in sub-tropical climates. Primitive horses, tapirs, small and agile land-living rhinos, oreodonts, large titanotheres, crocodiles, fish, and large swamp-dwelling rhinos lived here. Volcanoes were active during this epoch as well, and many fossils have

been found entombed in ancient lava-strewn areas, where mudflows and stream deposits buried the plant or animal.

Above, you see the titanotheres **Notiotitanops** (1) with primitive meat-eating **oreodont** (2) to the left. To the right is the intermediate form of horse, **Mesohippus** (3), with the tapir **Halates** (4) behind. To the left of Halates, on the far side of the water, is the primitive tapir **Hyrachyus** (5), browsing among the luxuriant growth. The lushness of the semi-tropical scene is in striking contrast to today's dry land.