PRELIMINARY

john day fossil beds

a study

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U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
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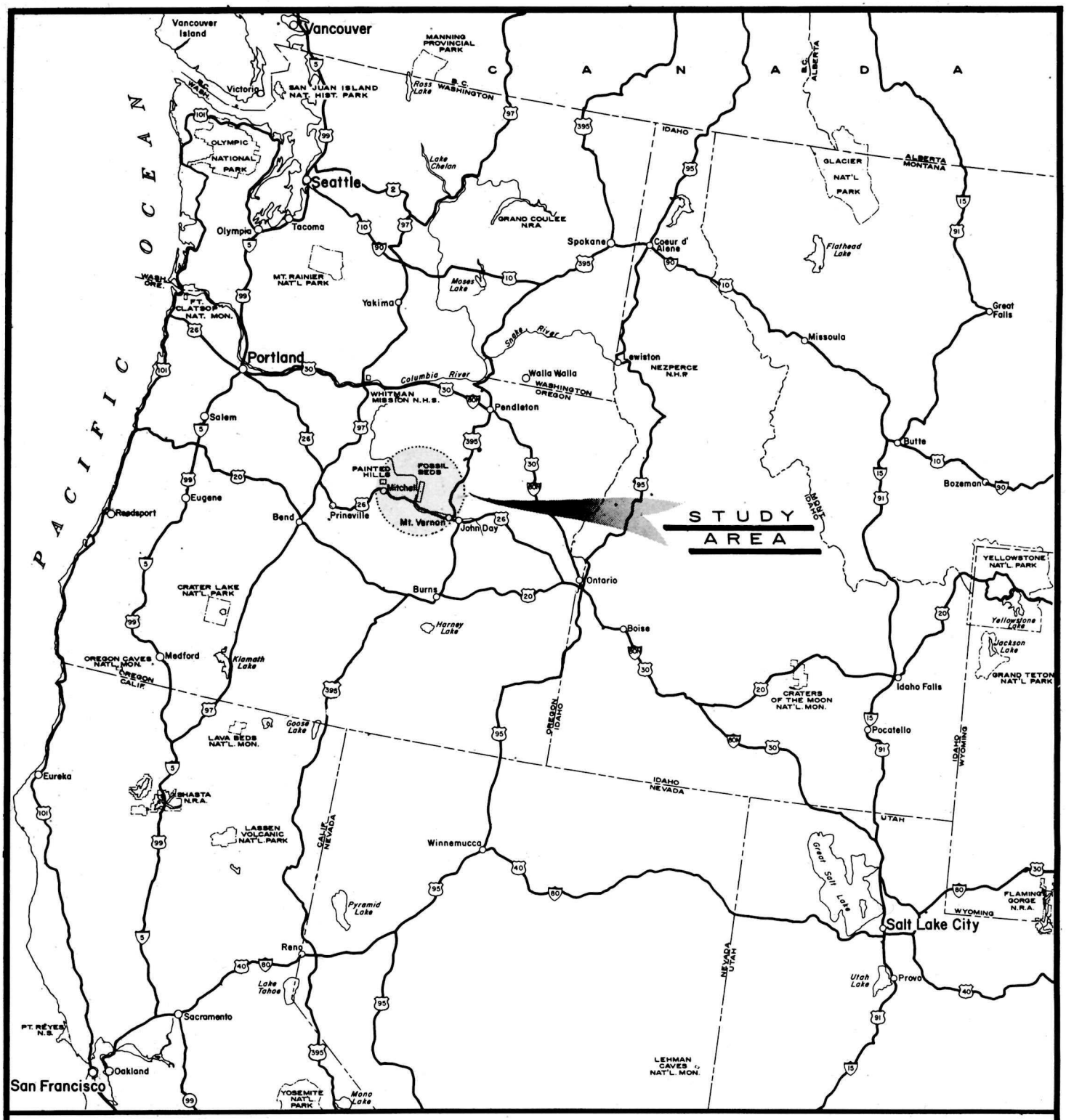
C O N T E N T S

MAPS



A STUDY

LOCATION MAP

UPPER JOHN DAY RIVER BASIN
OREGON

SCALE IN MILES
0 10 20 40 60 80 100
ONE INCH = APPROX. 34 MILE

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UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE

INTRODUCTION

This study report presents an analysis of the natural, scientific, and recreational resources of the Upper John Day River Basin in Grant and Wheeler Counties of eastern Oregon. It assesses the importance and suitability of these resources in relation to either local, state, or national development and management and recommends further courses of planning action that the National Park Service believes to be in the best public interest.

An informal evaluation report concerning the possible designation of the Painted Hills State Park in western Wheeler County as a national monument was made by the Service in the fall of 1965. It was made at the request of Representative Al Ullman of the Oregon Second Congressional District. The report concluded that the resources and potential of the 13-acre site under State ownership were not, in themselves, of sufficient importance to warrant national monument status. It further concluded that a comprehensive evaluation of the region as a whole would be requisite to any definite recommendations as to a combination of related sites for possible inclusion in the National Park System.

Representative Ullman requested the Service to conduct such a regional evaluation and an intensive field study, upon which the present analysis and recommendations are based, was completed in June 1967.

The scenic and recreational resources of the large segment of national forest lands within the Upper John Day River Basin have been taken into account for purposes of this analysis. However, no recommendations are presented concerning those lands and they are not included in the study area.

Registered Natural Landmark Plaque at the Sheep Rock Area

GENERAL SETTING

DESCRIPTION

The single most important feature that attracts notice to the area--especially for scientific research--is the presence of a great number of flora and fauna fossils found in the John Day geologic formation. The fossils have been exposed by the down-cutting erosive action of the John Day River and by geologic folding and faulting.

The river flows westerly to the vicinity of the existing Thomas Condon-John Day Fossil Beds State Park. At that point, it abruptly turns northward and follows that direction to its confluence with the Columbia 15 miles upstream from the city of The Dalles, Oregon. The sources of the John Day are in the Malheur and Wallowa-Whitman National Forests, to the south and east of the study area. Some 8,500 square miles are drained by the John Day; the upstream half comprises the area of investigation by the study team. The river varies in elevation from 800 feet above sea level at its mouth to 9,000 feet in the Strawberry Mountain Wilderness Area of the Malheur National Forest. At its lower elevations, the basin receives but a minimum amount of rainfall and is semi-arid, supporting a sagebrush type of vegetation; the higher elevations, with more abundant rainfall, are covered with ponderosa pine, mostly within the national forests.

POPULATION

The population of Oregon, according to 1960 census figures, was 1,769,000; it is now an estimated 2 million. Predictions for the 1975 population are 2,415,000. The 1960 population of Wheeler County was 2,722, with a 1975 prediction of 1,520. Grant County in 1960 was 7,726 and is estimated at 7,180 in 1975. Thus, while population trends indicate a slow but steady growth for the State as a whole, predictions for the two counties anticipate a continuing decrease over the same period of time. Canyon City, the county seat of Grant County and situated about 40 miles east of the Thomas Condon-John Day Fossil Beds State Park, has a population of 654. It was a "gold rush" town in the 1860's and the county government was established there at that time. Fossil, with a population of 672, is the county seat of Wheeler County, 65 miles north and west of the main unit of the State park. The town of John Day, population 1,520, is on U.S. Highway 26 and 40 miles east of the State park. Mitchell, with a population of 240, is 30 miles to the west while Prineville, population 3,650, is 80 miles to the west and outside the John Day basin. Both towns are on U.S. 26.

ACCESS

North-south U.S. Highway 395 and east-west U.S. Highway 26 are the two major travel arteries through the area. Other roads are State highways.

The majority of Oregon's population is in the western one-third of the State and the major highways serve that population. On the coast, U.S. Highway 101 carries a great number of vacationers to the coastal recreation areas. U.S. 5 and 99 are the north-south routes on the west side of the Cascade Mountains and pass through Eugene and Portland. U.S. Highway 97 is the north-south route on the east side of the Cascades through Klamath Falls and Bend. Route 395, the only other north-south road in Oregon, crosses the town of John Day and the study area. This highway comes from the south along the California-Nevada border and Reno and continues north through Pendleton, Oregon and the Spokane, Washington vicinity. U.S. Highway 95 cuts across the south-west corner of Oregon from California north into Idaho. The greatest portion of north-south traffic uses the highways to the west; U.S. 395 through the study area has very little through traffic, since most north-south Idaho traffic uses U.S. 95. Portions of 395 are snowbound in winter and the sections in California are closed to traffic for long periods of time, thus decreasing the popularity of travel on this road.

East-west traffic from the direction of Boise, Idaho uses U.S. 30 through Pendleton along the Columbia River Valley to Portland. This highway is being constructed to Federal Interstate Highway standards and redesignated I-80-N. Seventy miles south of the study area, U.S. Highway 20 goes through Burns from Boise, Idaho, to Bend. Faster through-traffic is attracted to this route in preference to U.S. 26 through the study area because it is straighter and flatter. The latter highway is a more scenic drive and is not conducive to high-speed travel.

State Highway Department traffic flow surveys show a daily vehicle count of 500 coming from any distance beyond the study area. Of this count, 10 percent was out-of-State, but obviously not all of these were vacationers or potential visitors. The number of "in-State" vehicles that carried vacationers or tourists is not delineated on the survey maps.

Other access is almost non-existent. There is no immediate rail service; Pendleton's rail depot is 3 hours by car from the area. Regularly scheduled air travel stops at Pendleton. There is a landing strip at the town of John Day used by small private planes; no commercial airlines land at this strip, although it appears to be large enough to accommodate twin-engined commercial aircraft. The airport also provides a rental automobile to flyers for ground transportation to town and return, but has no rental automobiles for the general public. There is no water access to the area. A Pacific Trailways bus makes one daily trip east and west through the area, but arrival times are before sunrise and quite inconvenient for getting accommodations. The study area is definitely geared to auto and truck travel.

LAND OWNERSHIP AND USE

Half of the land in the study area is federally owned and administered either by the Bureau of Land Management or the U.S. Forest Service. The State of Oregon and the local city and county governments own about 1 percent of the area. The remaining 49 percent is in private ownership. Lands in the Upper John Day Basin are evenly divided between forested and non-forested lands. More than 90 percent of the non-forested area is range land. The remainder is oriented toward stock support crops. The crops are winter feed and summer grazing for cattle, horses, and sheep. There is a considerable lumber industry operating out of the national forests. Other industries are of a very minor nature and primarily support the stock or lumbering enterprises.

The most promising individual sites investigated by the team are administered by the State Parks and Recreation Division, a branch of the State Highway Department. Most of this land is now in State ownership and was acquired from the Federal government through the Bureau of Land Management, which still administers much land in the vicinity.

CLIMATE

The climate of the study area varies greatly between seasons, with a marked seasonal variation between the higher and lower elevations. Generally, the summer season is comparatively mild. Throughout the river valley the average summer temperature will range between 55° and 67° F., with occasional periods of short duration between 90° to 110° F. Summers are dry with an average monthly rainfall of .51 inches from July through September. Generally the spring seasons are quite cold and wet with warm, drying weather not prevalent until late May or early June. Fall is extremely pleasant with warm sunny days and crisp cool nights.

In the forests surrounding the valleys, cooler summer temperatures are prevalent. The average temperature in the higher elevations is between 45° and 55° F. and occasionally above 100° F. Hot days are less frequent at this elevation than in the lower basins. Like the valley areas, summer precipitation is sparse with only a small amount of rainfall during afternoon thunderstorms. Climatic conditions during the spring and fall are similar to those of the valley areas.

The cooler temperatures prevalent in the higher forested areas provide excellent relief for the warmer adjacent valley areas.

VEGETATION

Because of the elevation and climatic differences of the study area, there is a distinct variation in the vegetative cover. Four vegetative life zones occur in the area:

1. Upper Sonoran: This zone includes the valley areas along the John Day River and its tributaries. It is characterized by vegetative associations of bunchgrass, rabbit brush, sagebrush, and chess or "cheat" grass with scattered juniper trees and cottonwood thickets.

2. Transition: The majority of the forest lands within the study unit are in this zone, which is characterized by associations of ponderosa pine, natural grassland, sagebrush, and bitterbrush.

3. Canadian: This zone covers the broad higher parts of the mountains of the area. The associations include grass- and shrub-covered open ridge tops within the steep slopes and canyon bottoms thickly forested with Douglas-fir, western larch, true fir and lodgepole pine.

4. Hudsonian: This zone exists but is very limited in the study area as it is only found around the highest peaks. It is characterized by associations of white bark pine and dwarf cedar, which occurs near timberline.

FISH AND WILDLIFE

Animal, bird, and fish life will probably continue to be one of the primary resources in the area. Mule deer and elk are abundant and deer are now the primary big game species. Black bears are native inhabitants of the general area. Predators find ample food supply in the large rabbit and rodent population. Bird life of all kinds is abundant, with many different species of game bird in evidence. Common among the game birds of the area are the California quail, Chikar partridge, and dove. Less common but plentiful are the ring-necked pheasant, Hungarian partridge, mountain quail, wild turkey and several species of grouse. The water fowl population in the area is cyclic and limited during periods of migration by a shortage of flyway water, caused by the extremely cold temperatures prevalent throughout winter months.

The John Day River and its tributaries are important producers of salmon and steelhead. These two species of game fish are plentiful and several species of trout also are found in the streams and lakes of the area.

THE RESOURCES

NATURAL HISTORY

The John Day Fossil Bed Formation is colorful and rugged. The most widely known of these fossil-bearing beds, with their attendant scenic features, are essentially contained within eight existing State park units. Five of these are along the John Day River and State Highway 19 between the town of Kimberly and Picture Gorge, and a sixth unit is west of Dayville; all are in Grant County. Two units are in Wheeler County: one between the communities of Fossil and Clarno on State Highway 218; the other, ten miles northwest of Mitchell on a local route known as the Bridge Creek Road.

Other areas of particular interest, such as Haystack Valley and Clarno Vertebrate Quarry are of paleontological importance but are not currently included in the State park system. Units of scenic value are:

Sheep Rock (3,965 acres) This colorful and spectacular park takes its name from a prominent and sharply pyramidical peak with an elevation of 3,566 feet and rising 1,337 feet above the valley floor. The peak is readily identified by its dark "cap sheaf" of Columbia River Basalt resting on top of the John Day Formation, which makes up the mountain mass. This basalt remnant has the appearance of being ready to fall from the peak top at any time. The geologic deposits forming the mountain mass are highly picturesque with their many bands of delicate tints and shades of changing color. Also within this unit is the interesting "Painted Gorge" which takes its name from the many Indian pictographs found on the smooth rock faces of the canyon wall. Their location within a few feet of the highway has made protection difficult and they have been rather severely defaced. The dark coloring of the gorge contrasts with the light shade of the surrounding area.

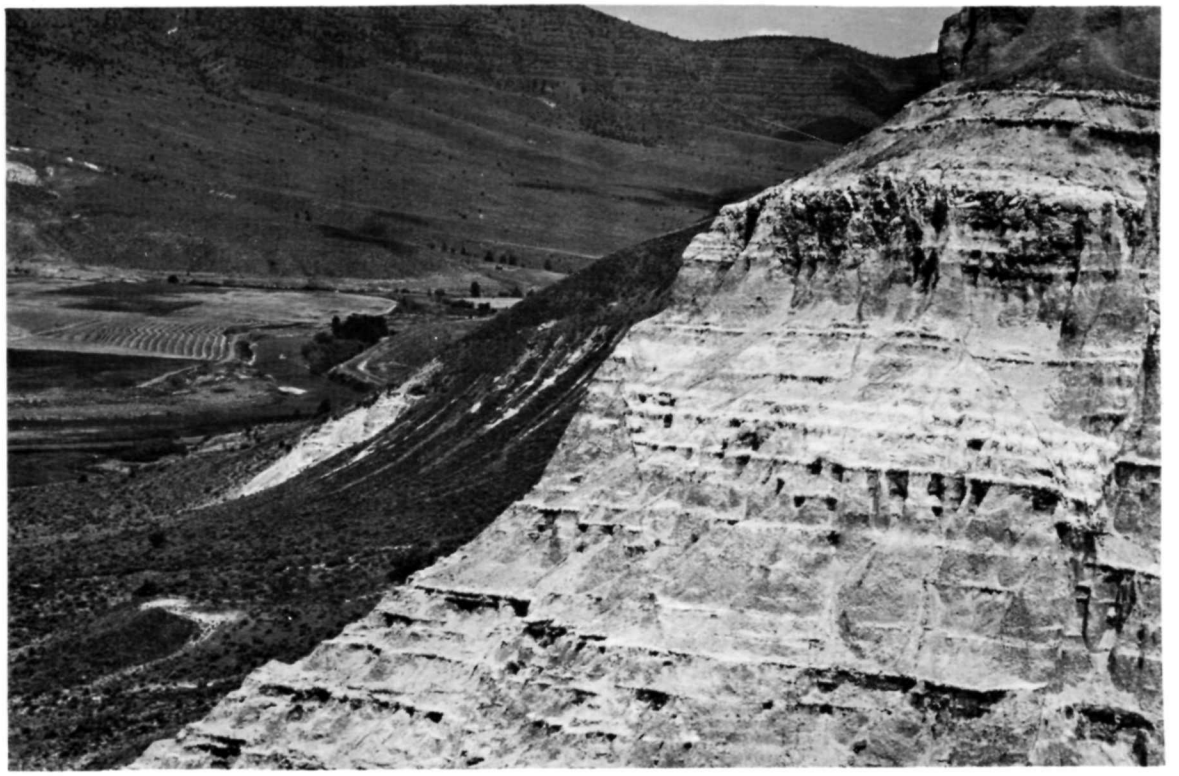
Turtle Cove (240 acres) This unit is considered by scientists as the "largest exposure" of the John Day Formations in the area and takes its name from the fossil remains of land turtles and tortoises found here. The University of California party of 1899 referred to the area as "Blue Basin" because of its color and was described by them as a veritable labyrinth of canyons, gulches, and coves cut into the soft blue rock of the middle John Day Formation by heavy rains. The coloring of these beds is outstanding; all of the most delicate shades are prevalent.

The Foree Unit (80 acres) a few miles north on State Highway 19 contains similar scenic and scientific features.

Sheep Rock, Thomas Condon-John Day Fossil Beds State Park. A major landmark of the John Day Basin and the key interpretive site.

Photo courtesy of Travel Division, Oregon State Highway Department

Foree Unit, Thomas Condon-John Day Fossil Beds State Park.
ABOVE: View of banded, colorful exposures of John Day Formation.
BELOW: Detail view at same Formation.



The Cathedral (40 acres) This site presents one of the most impressive and striking views of the middle John Day Formation. Adjacent to the highway, it offers the traveler a close-up view of this fossiliferous division with its fluted columns of delicately tinted shades of blue and green.

William Mascall Overlook (2 acres) This site not only includes a comprehensive view of the Sheep Rock-Picture Gorge Unit but also the Cottonwood Creek Valley where the Mascall Formation rests upon the Columbia lava which overlies the John Day beds. An excellent view of the picturesque Mascall, Rattlesnake, and John Day Formations can be observed from this point.

View north from Mascall Overlook. Three of the four geologic ages of the Tertiary Period as represented in the Upper John Day Basin are visible from this point. Picture Gorge, with the cap of Sheep Rock immediately behind it, is at the right center. The Mascall Formation is in the foreground.

Davis Dike (20 acres) Here the traveler receives an impressive close-up view of the Columbia lava formation. At this site a lengthy, intrusive, basaltic dike crosses both State Highway 19 and the John Day River, a remnant of which rises some 10 to 12 feet above the river bank and is also discernible for some distance up the mountain slope east of the highway.

Clarno State Park (120 acres) This unit, while not as colorful as the others in the State park complex, is quite picturesque. Much of this formation is varicolored brecias, conglomerate tuffs, and rhyolite flows which have been eroded into peculiar shapes. It is a concentration of massive fluted columns. Its location adjacent to a highway, State Route 218, offers the traveler a close view of this colorful and outstanding example of the Clarno Formation.

Colorful, eroded spires in Clarno State Park.

Painted Hills State Park (13.2 acres in fee plus public use easement on 2,830 acres)

This significant name so adequately describes the surface of this park unit that it almost overshadows its scientific importance. Two basic formations are exposed here--the Upper Clarno and lower John Day. The valley floor or the Clarno Formation is usually a grey or buff, but sometimes shows brilliant colorations of red, green and brown. Above the valley floor the rising center of the John Day Formations display their bright harmoniously-blended colorings on smoothly rounded domes, slopes, and ridges of varying heights. The State is negotiating for the purchase of the 2,830 acres of privately owned land.

Painted Hills State Park.

GEOLOGY

The upper basin of the John Day River Drainage extends from the gorge at Clarno, near Clarno State Park, through all of the upstream drainage. The river, called the Middle Fork, has two branches: the North Fork and the South Fork. Numerous tributary creeks feed the river along its course. Elevation varies from approximately 2,500 feet at Clarno to 9,000 feet in the Strawberry Mountains. The regional climate is now semi-arid, but in the geologic past it ranged all the way to subtropical at the beginning of the Cenozoic era. Prior to this time most of the State was covered by the oceans. There is very little evidence of the invasion of the seas in the basin area where the older deposits are buried under the more recent Cenozoic rock which has not yet eroded away.

During the Cenozoic era, formations containing fossils were laid down. It represents earth history of the last 70 million years and is divided into two periods, of which Quaternary is the most recent 2 or 3 million years. This period in turn is divided into two epochs: the Recent includes current time to 1 million years ago; and the Pleistocene, from 1 to 3 million years ago. The previous period is Tertiary, which goes back 70 million years and is divided into five epochs: Pliocene, Miocene, Oligocene, Eocene, and Paleocene (listed in order of the youngest first). All but the Paleocene are recorded in the Upper John Day Basin.

Of the formations seen in the John Day Basin the oldest is called the Clarno. This extensive formation has outcrops beyond the basin area and is calculated to be 37 million years old. The formation consists of basaltic and rhyalitic flows, breccia, tuff, volcanic conglomerate, and some thin lenses of water-laid volcanic ash. Fossil plants and animals from the Clarno indicate an age of late Eocene and early Oligocene.

The John Day Formation, above the Clarno, was deposited after the Clarno was deformed. It, too, extends considerably beyond the basin. The upper formation is buff, the middle is green, and the lower is red tuffaceous siltstone. Much of the formation originated as volcanic ash. Fossil plants in the lower section confirm the late Oligocene age and the mammal remains in the upper section indicate the early Miocene age.

Overlying the John Day is the Columbia River Basalt (from the Miocene epoch), much of which has been removed by erosion. This lava was from great long narrow splits in the ground that spread the flow over extensive land areas. Repeated flows over millions of years built up great thicknesses of basalt. Davis Dike, among others, illustrates the source of the tremendous quantity of lava which covered northeast Oregon to a depth of 2,500 feet in places. These are not like volcanic flows that commonly eject from a single vent in a built-up mountain with secondary flows from fissures in the mountain side.

The next younger formation is the Mascall, directly on top of the Columbia. Present exposures are mostly in the John Day Basin where an exposure of 2,100 feet is in evidence. The formation is water-laid light-colored tuffaceous volcanic ash. Fossil remains indicate the Miocene age, approximately 15 million years old.

The 6.5 million year old Rattlesnake Formation on top of the Mascall is from the Pliocene epoch, the youngest of the Tertiary Period. It consists of bedded-tuffs, gravels, and sandstone of lacustruce and fluviatile origin, contains many fossils, and was dated by the potassium-argon method.

Erosion during the more recent Pleistocene epoch formed many terraces, talus slopes, and alluvial deposits. These deposits are the source of gold which figured so prominently in the initial settlement of this area.

JOHN DAY BASIN GEOLOGY

	PERIOD	EPOCH	FORMATION	GEOLOGIC EVENTS
CENOZOIC ERA	QUATERNARY	RECENT	ALLUVIUM	GLACIERS RECEDING. PRESENTLY EXISTING VOLCANOES FORMED. SOME LAVA FLOWS.
		PLEISTOCENE (1-m yrs)	FLOWS AND CINDERS	LARGE GLACIERS IN THE MOUNTAINS. LARGE LAKES IN SOUTH-CENTRAL OREGON. MASTADON AND GIANT BEAVER IN THE CASCADES. HORSE AND CAMEL IN THE FOSSIL LAKE AREA.
	TERTIARY	PLIOCENE (13-m yrs)	RATTLESNAKE (6.4-m yrs)	FIRST VOLCANOES IN CASCADES. MANY LAVA FLOWS IN SOUTH-CENTRAL OREGON. HORSES, RHINOS, CAMELS, ANTELOPE, BEAR, AND MASTADON IN JOHN DAY AREA. WARM TEMPERATE CLIMATE.
		MOICENE (25-m yrs)	MASCALL (15-m yrs) COLUMBIA RIVER BASALT (18-m yrs)	LAVA FLOWS OVER MUCH OF THE STATE. OREDONTS, THREE-TOED HORSES, GIANT PIGS, AND SABER-TOOTHED CATS IN THE JOHN DAY AREA. MILD HUMID CLIMATE IN EASTERN OREGON.
		OLIGOCENE (36-m yrs)	JOHN DAY (25-m yrs)	WARM TEMPERATE FLORA THROUGHOUT THE STATE. THREE-TOED HORSES, CAMELS, GIANT PIGS, SABER-TOOTHED CATS, OREDONTS, AND TAPIR IN JOHN DAY AREA. CASCADE RANGE LOW, NO EFFECT ON CLIMATE.
		EOCENE (63-m yrs)	CLARNO (37-m yrs)	SUB-TROPICAL FORESTS IN CENTRAL OREGON. PALMS, FIGS, AVOCADOS, PECAN, AND WALNUT. FOUR-TOED HORSES, RHINOS, TAPIR, AND CROCODILE IN CLARNO AREA. VOLCANOES IN THE CASCADES AND SEA INVASION OF EASTERN OREGON.

RESOURCES AND GEOLOGICAL FORMATIONS MAP

UPPER JOHN DAY RIVER BASIN

OREGON

UNITED STATES DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

N W E S

0 1 2 4 6 8 10 12
SCALE IN MILES

LEGEND

STATE HIGHWAYS 218 19

FEDERAL HIGHWAYS 26

STREAMS

STATE PARKS

MAJOR GEOLOGIC EXPOSURES

FORMATION	EPOCH
RATTLESNAKE	PLIOCENE
MASCALL	LATE MIOCENE
COLUMBIA RIVER BASALTS	MIOCENE
JOHN DAY	EARLY MIOCENE AND OLIGOCENE
CLARNO	EARLY OLIGOCENE AND EOCENE

WAYSIDES

STATE PARKS

* UNITS OF THOMAS CONDON-JOHN DAY FOSSIL BEDS STATE PARK

AREAS OF PARTICULAR INTEREST

TO CONDON 20 MILES

TO HEPPNER 51 MILES

TO PENDLETON 89 MILES

TO ANTELOPE 11 MILES

TO PRINEVILLE 48 MILES

TO BAKER 94 MILES

TO BURNS 70 MILES

WHEELER COUNTY

GRANT COUNTY

CLARNO VERTEBRATE QUARRY

CLARNO STATE PARK

CLARNO

FOSSIL

SHELTON WAYSIDE

HAYSTACK VALLEY

SPRAY

SERVICE CREEK

DONNELLY BASIN

PAINTED HILLS STATE PARK

BRIDGE CREEK BEDS

MESOZOIC BED

PAINTED HILLS

MITCHELL

FOREE AREA

KIMBERLY

DAVIS DIKE UNIT *

FOREE UNIT *

THE CATHEDRAL UNIT *

TURTLE COVE

TURTLE COVE UNIT *

SHEEP ROCK

SHEEP ROCK UNIT *

PICTURE GORGE

MASCALL OVERLOOK

DAYVILLE

MONUMENT

MONUMENT BEDS

HAMILTON

SUNKEN MOUNTAIN *

LONG CREEK

PRAIRIE CITY

JOHN DAY

CANYON CITY

MT. VERNON

CLYDE HOLIDAY WAYSIDE

HALL HILL RESERVOIR SITE

DEARDORFF RESERVOIR SITE

JOAQUIN MILLER RESERVOIR SITE

Pine Creek

Currant Creek

Kohler Creek

North Fork John Day River

Middle Fork John Day River

South Fork John Day River

Field Creek

KEY MAP

Astoria, The Dalles, Pendleton, Portland, La Grande, Salem, Albany, Baker, Eugene, Bend, Prineville, Ontario, Burns, Klamath Falls, Lakeview, STUDY AREA

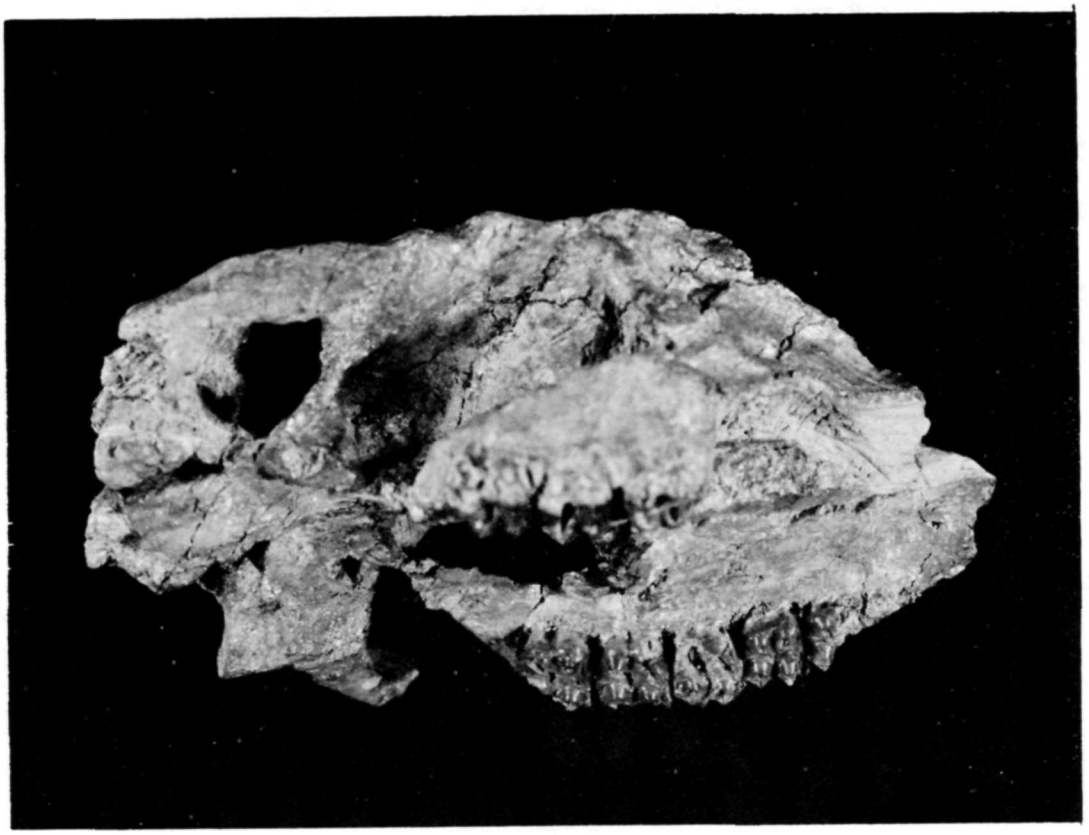
Fossils

John Day Basin is primarily significant as a record of the earth's history displayed through rocks and fossils which cover a considerable period of time.

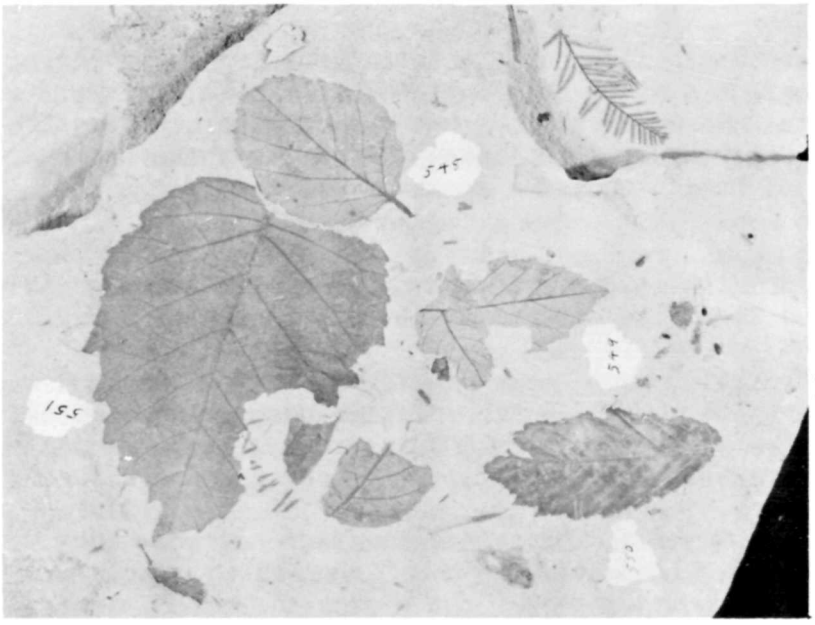
Pre-Tertiary: Although the most complete record of life is in the Tertiary rocks, this is not the beginning of the local record. Pre-Tertiary rocks more than 100 million years old are also present in the John Day Basin. The record indicates the presence of a sea in the area at this early date; ammonites, shore shells, and bones of swimming and gliding reptiles are present. Because it is overlain by a tremendous volume of younger rocks, this very early record is poorly represented in the basin.

Clarno Formation: The Clarno flora and fauna are the oldest Tertiary life in the basin. The flora fossils found here are sub-tropical; the laurel and palm families are well represented. Important fauna remains uncovered included crocodiles, amphibious and small running rhinoceros, brontotheres, tapirs and tiny horses, and peccaries and oreodonts--the pig-like artiodactyls.

Tiny horse of the Clarno Formation--about the size of a large dog; note the crushed skull.



John Day Formation: The character of the vegetation and fauna recorded in fossils of this formation changed remarkably from that found in the Clarno. The flora look more familiar to most Americans because of their temperate character, although some of the plants have relatives living only in Asia. Oaks, elms, sycamore, chestnut, basswood, birch, hornbean, and maples are representative of plants found in the United States today; Metasequoia and Katsura of Asia are, however, important parts of the flora. One hundred and twenty species of fossil mammals have been identified from this formation. They vary from small relatives of the opossum through sabertooth cats, rhinoceros, oreodonts, horses, peccaries and giant hogs to beavers, dogs, rabbits, and pocket mice. Tortoises, lizards, snakes, and land snails also are commonly presented in the collection.



Leaves of the John Day flora, including dawn redwood, alder, birch, and Katsura tree.

Mascall Formation: This formation reveals other life changes, especially in the recorded flora. Common plants are swamp cypress, black oak, hickory, sycamore, a small leaf maple, gingko, box elder, elm, and over sixty other less common species of plants. They represent several kinds of local habitats, reflecting hillsides, ponds, stream borders and plains. Much of the fauna was derived from earlier animal life of the John Day Formation. Three-toed horses, elk-like Dromomeryx with horns rather than antlers, bear, and mastodons appear for the first time.

Rattlesnake Formation: The flora and fauna of this formation provide the last view of Tertiary life in the John Day Basin. Dryer climate had reduced vegetation to trees and shrubs along the stream courses, and at the higher elevations grassland had become extensive. The large single-toed horse and antelope had invaded the area from the south; rhinoceros, camels, peccaries, and mastodonts were common large mammals. The small sloths from South America appeared for the first time in the basin. The oreodonts so abundant in earlier fauna were no longer present and the elk-like Dromomeryx were also gone.

History of Research and Fossil Collecting

During 1861 Thomas Condon, a minister, moved to The Dalles, Oregon to establish a pioneer church. In traveling this vicinity he found fossils in some of the formations near The Dalles. Occasionally he would give brief lectures about the fossils and was recognized as a local authority on the subject. By 1864 people were bringing specimens from greater distances and Condon's collection increased in size. By 1871 Condon knew enough about the area that he published, in the Overland Monthly, an article describing the geologic history of the area. Condon later became a member of the staff of the University of Oregon.

In 1873 Le Conte, from the University of California, surveyed the basin and collected samples for study at the university.

The best known collector to visit the area and take samples for study was J. C. Merriam who made his first trip in 1899 while still at the University of California. He made numerous subsequent trips while still at California and later at Carnegie Institute. He also spent a short time at the University of Oregon where he continued his studies of the John Day area.

R. W. Chaney collected and studied in the area over a 40-year time span, starting with the Clarno Formation flora and later studying the John Day Formation.

J. A. Shotwell, University of Oregon, in more recent years worked in an area west of the present Clarno State Park. This area produced fauna fossils of the Clarno Formation which had not been previously uncovered.

During the approximately 100 years of fossil collecting and research in this area, more than 120 fossil mammal have been identified. They range in size from very small mice to huge rhinoceros and oreodonts. Fossil snails have also been collected.

HISTORY

The principal historical theme represented in the study area is that of Westward Expansion to the Pacific, 1830-1898. The more important subthemes that relate to the history and development of the area are The Mining Frontier; Transportation and Communication; Military and Indian Affairs; Religious Movements; The Cattlemen's Empire; and The Fur Trade.

Of these subthemes, The Mining Frontier, in the form of gold mining, was the most important and dramatic. It had far-reaching consequences in the occupancy and settlement of the John Day country.

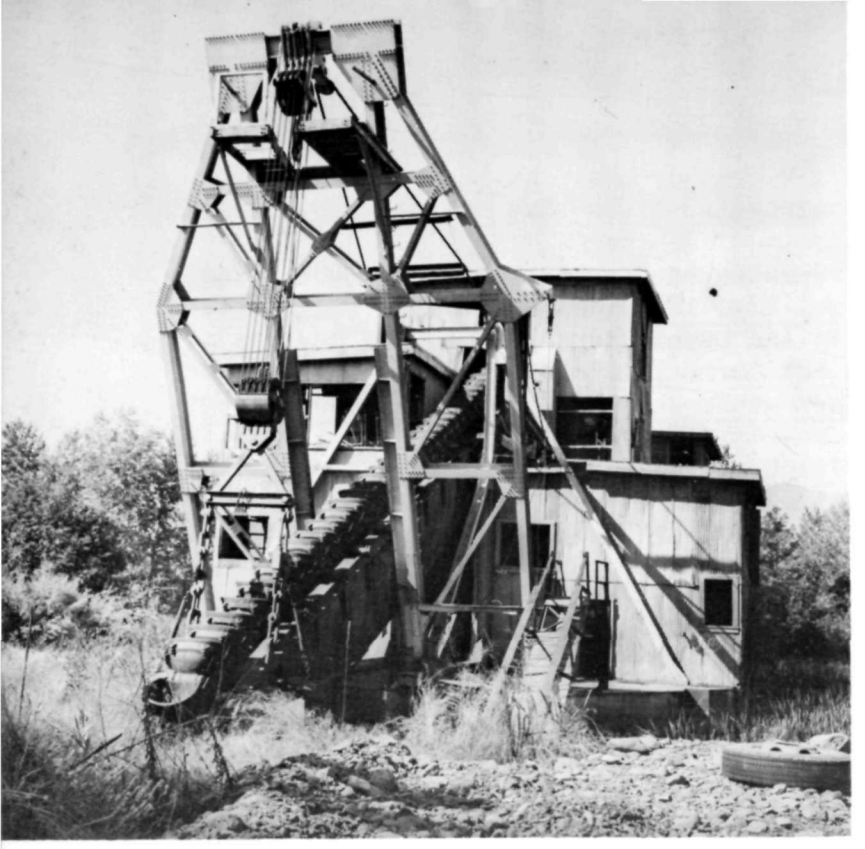
This era began in 1862 with the discovery of gold on Canyon Creek, just south of the present community of John Day. Prospectors flocked to the John Day country and to Canyon City on Canyon Creek from "diggings" in south-western Oregon and northern California. A large influx of Chinese prospectors and laborers helped shape the new "boom" town of Canyon City and the surrounding area. Canyon City was the earliest settled community in Grant County and became the county seat in 1864.

The Dalles-Canyon City pack train and stage line began operation in May, 1864. Gold was shipped on this line from Canyon City to The Dalles on the Columbia River. From there it was transported by boat down the Columbia to Astoria, thence by sea to the San Francisco mint.

In February 1867, The Dalles-Canyon City Military Wagon Road was established under contract with the Army and gold shipments were continued via the Wagon Road. Some $26 million in gold was mined and shipped from Canyon City from 1862 to 1870. At its zenith, Canyon City supported a population of 10,000. However, after a few years the mines and gold-bearing gravels were worked out and the gold rush was over. All but a fraction of the Canyon City population moved to newer fields. While Canyon City today remains the county seat of Grant County, it is thoroughly modernized. Only a few individual buildings from the mining era remain.

The extraction of gold from the vicinity has continued on a limited scale until recently. One of the few gold dredges remaining in the United States and one of two in Oregon is located at Mount Vernon. It was in operation at least as recently as 1946 and is essentially intact.

The Mining Frontier, as well as the Transportation and Communication sub-themes, are represented by the site of the Burnt Ranch and stage station on the south bank of the John Day River near the mouth of Bridge Creek in western Wheeler County. The ranch and station, established in 1864, were operated by James N. Clark, an early homesteader. It was a stopping point for pack trains between Canyon City and The Dalles, and later served as a stage station. The station and ranch buildings were burned by Indians in 1866, from which the name Burnt Ranch is derived.



Gold mining dredge at Mount Vernon. Used as recently as 1946, it is nearly intact and could be of interest to tourists.

A ranch at Fossil is of historic interest and relates to Transportation of Communication. Four land claims were laid out here in the early 1800's. Hoover's cabin, situated on one of the claims, became the post office in 1876.

Military and Indian Affairs in the study area includes the sites of two U.S. Army posts: Camp Watson in southeastern Wheeler County and Camp Logan in southeastern Grant County. Both were short-lived. Camp Watson, astride The Dalles-Canyon City Military Wagon Road, was commissioned in 1864 to protect the gold shipments and the settlers. It was typical of the posts established along travel routes after eastern Oregon had been opened to settlement. The post was released and the buildings burned by the Army in 1869.

Camp Logan was established in 1865 and terminated in 1868. No physical evidence of either post remains today and the site of Camp Watson is not accessible by road.

A cabin built in 1864 and occupied for a time by Joaquin Miller, the "poet of the Sierras," is located in Canyon City on grounds administered by the Grant County Historical Society Museum. Miller had come to Canyon City to practice law and is said to have started writing verse here. The cabin has been moved to its present site from its original location. Miller's home in Oakland, California is a Registered National Historic Landmark.

The Joaquin Miller Cabin
Canyon City

The Historical Society Museum displays an extensive collection of items from the gold mining era, plus a large assortment of antiques and relics from the frontier days to the recent past.

The first church in Grant County was the St. Thomas Episcopal Church in Canyon City. It was built in 1876 under the direction of a pioneer missionary, Dr. Rueben Denton Nevins, when Canyon City was a mining community. It is still an active church and the best remaining example of the Religious Movements sub-theme in the area.

The first cattle ranch in the general area was established northeast of John Day by the Trowbridge Company in 1862. It is still operated by the descendants of the founder and, under a program administered jointly by the Oregon Department of Agriculture and the Historical Society, it has been designated a Century Farm. Other ranches that have been in continuous operation by the same family for approximately 100 years are the Cant Ranch at the main unit of the Thomas Condon-John Day Fossil Beds State Park and the Mascall Ranch just south and east of Picture Gorge.

One other building of historical interest is the Chinese Building, located in John Day City Park. It was constructed in 1867 of masonry and hand-split logs by Chinese during the gold rush and is the only remaining structure erected by this once-numerous segment of the local population.

With respect to The Fur Trade, the area was one of the fields of operation of Hudson's Bay Company fur brigades during the 1820's and 1830's.

ARCHEOLOGY

The University of Oregon Museum of Natural History has conducted most archeological research, investigation, and cataloguing in the study area. Sites for further investigation and excavation have been found and two excavations have been made at sites adjacent to the study area. Of minor importance, they revealed only one burial, dated at about 1400 A.D., and minor artifacts. In the study area there are no known scientific excavations. One excavation was done near Service Creek but there is no record of the findings. Cave sites along Rock Creek have been vandalized by "pot-hunters," but open sites are relatively untouched. All sites investigated are only of local significance.

RECREATION

The John Day River Valley itself has very limited recreational facilities at the present time, not because of any lack of resources but because little development has as yet been accomplished.

Oregon's State Park System is widely known throughout the United States for its outstandingly high quality of development, administration, and park acquisition programs. As with other public land managing agencies, however, the mounting recreation pressures and greater demands of the more populous and heavily-travelled sections of the State have made it necessary for the State Parks and Recreation Division to concentrate its efforts and funds in those sections. Consequently, programs in areas like the upper John Day Basin have had to be deferred. Even so, some new acquisitions and developments of State Park and Recreation areas have been made, such as Clarno State Park, now in the initial phase of development, and the Clyde Holliday Wayside.

The older Shelton Wayside (180 acres) on State Highway 19, 10 miles southeast of the town of Fossil, includes a 20-unit campground. At Unity Reservoir, just east of the upstream limits of the Basin on U.S. 26, there are 20 trailer sites and minor camping facilities. Limited picnicking is available at the Foree Unit of the fossil beds area and at Painted Hills. Rest and lunch stop areas are located in a number of places along the highways: at the Johnny Kirk Springs, a highwayside a few miles north of the Sheep Rock Unit on State Route 19 noted for its abundance of cold, sparkling spring water; and the newly developed Clyde Holliday Wayside just east of Mount Vernon.

Overlook parking areas and foot trails have been established in some of the fossil bed units but, for the reasons noted above, the State has not developed an interpretive program for the scientific resources.

The Bureau of Land Management has a checkerboard pattern of public domain lands adjoining the river and has classified this land for recreational use. However, no planning or development of recreational facilities has as yet been undertaken.

The river valley offers the visitor opportunity for such recreation activities as sightseeing, steelhead and salmon fishing, picnicking, hiking, and rock and fossil hunting. With the exception of camping, for which the valley has but extremely limited potential, a definite need exists for the development of additional public use facilities and access and for the interpretation of the resources where appropriate.

The valley is surrounded almost entirely by national forests, four of which are in the basin. These lands certainly contain unlimited recreational resources. The area is widely known for its hunting of both big game and game birds. It contains the headwaters of several small rivers and many streams, which are fairly evenly distributed throughout the national forest land and maintain a year-round flow of water which supports fish life. The many small lakes are open to sport fishing throughout the year. Boating is permitted on a few of the larger lakes. Road access to the vast area is good and current camping and picnicking facilities adequate. The Malheur Forest alone has 17 improved campgrounds of various sizes, well located with good distribution throughout the forest. In addition, they have numerous unimproved areas where camping is permitted. The other forests involved have similar facilities. These are hiking and horseback riding opportunities throughout this area on an adequate system of foot and riding trails. Currently there is some winter sports activity in the forests; however, the U.S. Forest Service believes that these areas are poorly located and, consequently, during years of light snow and extremely cold temperatures, little use is made of these facilities. Because of the distance to these areas from any population center this activity would probably be limited to local use only.

In summary, interesting and colorful scenery is to be found through the entire basin and recreational resources are abundant throughout the area. The existing facilities in the John Day River Valley are not adequate, and there is a definite need to develop and interpret the resources found here. Existing facilities in the national forests, on the other hand, are more than adequate to meet the present demand. Expansion is planned by the Forest Service to accommodate public use of the national forests when the visitor use indicates the need.

It is believed that the existing, primarily natural, water resources of the Upper John Day Basin are adequate to meet the present recreational need. Should future needs require expansion, the construction of the Hall Hill, Deardorff, or Joaquin Miller Reservoirs, now under study by the Bureau of Reclamation, could well meet the demand. All are a considerable distance from the fossil beds area and the impoundments would have little or no effect on the natural qualities or features of that area.

PRIMARY RESOURCES

Geology and Paleontology

Of the natural, scientific, and recreational resources within the area of study, those of paramount importance are scientific. Specifically, they are those resources concerned with geology and paleontology, including paleobotany.

A plaque designating the Thomas Condon-John Day Fossil Beds State Park as a Registered Natural Landmark was presented to the State of Oregon on March 1, 1967. Thus the national significance of the fossil beds and their exceptional value and importance in illustrating the natural history of the United States is recognized and established.

The paleontological and associated resources of the Upper John Day Basin were evaluated for purposes of this study by Dr. J. Arnold Shotwell, Director of the Museum of Natural History, University of Oregon. Dr. Shotwell's report, submitted to the National Park Service on July 20, 1967, contains the following conclusions:

> "The primary significance of the John Day Basin is in the record of Earth History, displayed in its rocks and fossils covering a considerable portion of time."

His report concludes further:

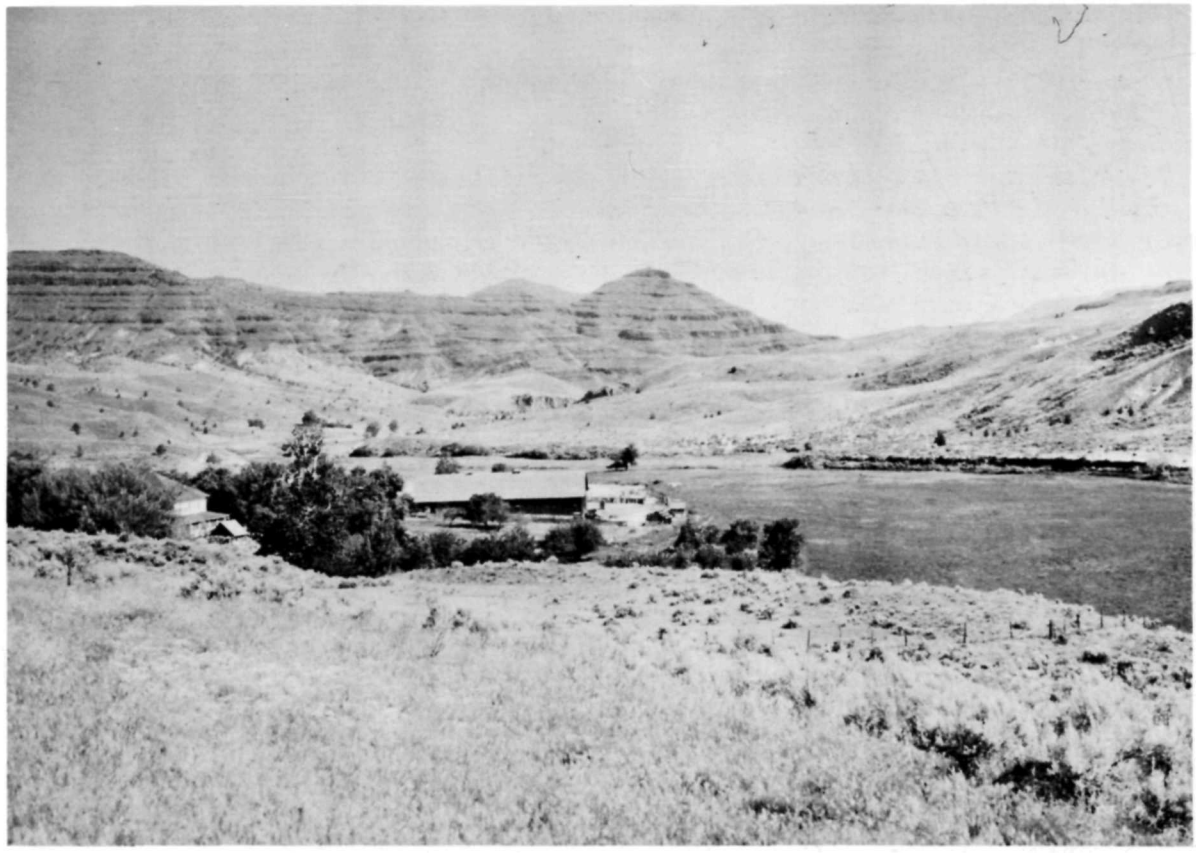
> "There is no question(s) of the national or even international significance of the John Day Basin. It has been clear for one hundred years. Neither is there any question of the clarity of the story to be seen by the visitor; this is its chief value."
>
> "Other areas . . . Dinosaur, Agate Springs, Badlands and Florissant, all deal with single chapters or some unique aspect of single chapters in the history of life. The John Day Basin offers an entire book!"
>
> "Nature has provided in the John Day Basin a unique opportunity to see Earth History under the most desirable conditions."

Dr. Shotwell supports his evaluation and conclusions with statements quoted from three widely recognized authorities: Thomas Condon, who conducted most of the initial research on the geologic history of the area, beginning in 1864; Dr. J. C. Merriam of the University of California and the Carnegie Institution; and R. W. Chaney, who conducted extensive research on the fossil flora of the area about 10 years ago.

In 1948, the last named authority said:

> "No State is more richly endowed with the records of earth history. No region in the world shows a more complete sequence of Tertiary land populations, both plant and animal, than the John Day Basin."

The Shotwell report was submitted for verification to Dr. Theodore E. White, Paleontologist, Dinosaur National Monument; and to Dr. J. T. Dutro, Jr., Chief, Paleontology and Stratigraphy Branch, U.S. National Museum, Smithsonian Institution. Both scientists have indicated by letter that they are in full agreement with Dr. Shotwell's conclusions and recommendations.



The Cant Ranch showing ranch buildings and irrigated land bordering the John Day River. This ranch has been in continuous operation by the same family for 100 years. Continued operation would be compatible with a John Day Fossil Beds National Monument.

SECONDARY RESOURCES

Scenic Resources

The colorful exposures of the John Day Formation and the high buttes, escarpments, and pinnacles formed by the Columbia River Basalts and the Clarno exposures in Wheeler County and the western part of Grant County present a pleasing and quite impressive scenic landscape. This is particularly true of the countryside along State Highway 19 from its junction with U.S. 26 at Picture Gorge north to Kimberly and on north and west to the communities of Spray, Service Creek, Fossil, and Clarno; adjacent to State Route 207 from Service Creek southward to Mitchell on U.S. 26; along State Route 208 from Kimberly east to Monument and Long Creek; and along north-south U.S. 395 from Long Creek to Mount Vernon.

The John Day River is normally an attractive, clear-flowing stream. However, it becomes extremely low or sometimes dry in late summer. While the landscape values of the area are of definite interest and appeal to the visitor, they are not outstanding or spectacular in the sense of a Canyonlands landscape, for example, and they are not of national importance.

History

The historic resources of the John Day Basin present typical evidences of frontier activities and development. They are primarily of State or local significance.

Archeology

The archeological resources of the Upper John Day River Basin were assessed by David L. Cole, Curator of Anthropology, University of Oregon Museum of Natural History. Cole's report of July 24, 1967 contains the following conclusion as to their significance:

> "At the present time, there are no archeological sites known in the region of the John Day River drainage that deserve the status of being nationally important. However, the region is essentially unknown archeologically. In the Great Basin, to the south, and along the Columbia River, to the north, there are sites such as Fort Rock Cave[1] and the Five-mile Rapids Site that have the status of having considerable significance. It is not improbable that sites of equal importance could be found in the John Day Basin."

Recreation

The John Day River is quite limited in existing recreation facilities though it has the potential for a number of activities. The higher, forested area surrounding the valley contains extensive recreational resources. Facilities have been developed here to meet present demands, and this area has unlimited possibility for expansion.

1/ Fort Rock Cave is a designated Registered National Historic Landmark.

Additional opportunities for water-related recreation may be created by the impoundments which are currently proposed by the Bureau of Reclamation. Such opportunities would vary with the combination of impoundments that might be authorized but, in any event, they would be of State or local importance.

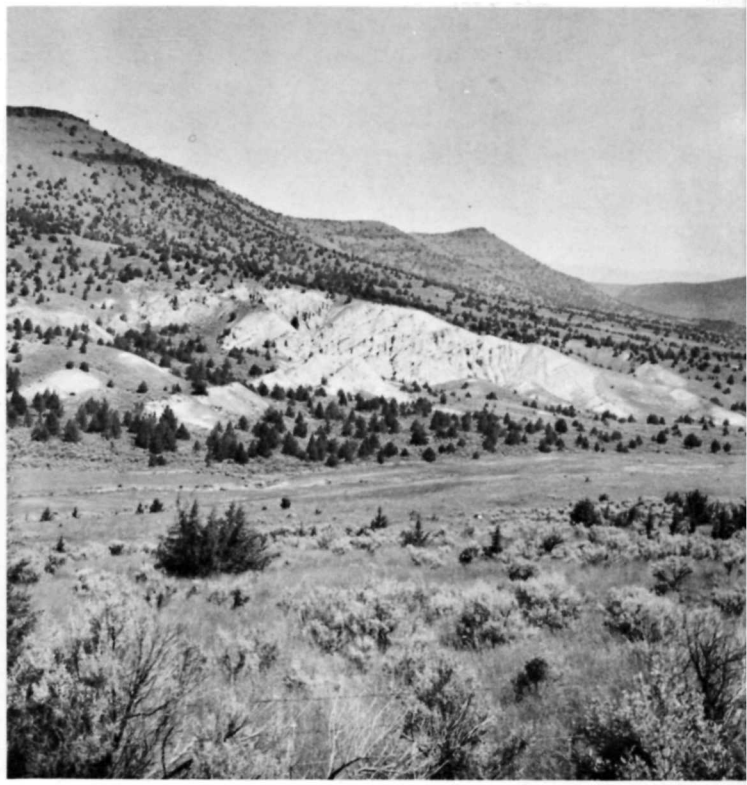
SUMMARY OF SIGNIFICANCE

1. Scientific research and analysis, verified by qualified authorities, has determined that the geological and paleontological resources of the Upper John Day Basin are definitely of national significance.

2. The limited research conducted to date has revealed no outstanding or nationally significant archeological sites in the basin. However, archeologists believe some may exist.

3. The evaluation resulting from the field investigation made by the National Park Service study team has established that the scenic, historic, and recreation resources of the basin are principally of State or local interest and importance.

Views from State Route 207 near Service Creek. An exposure of John Day Formation appears as the light area in the right photo.



PROPOSED DEVELOPMENT AND USE

Should the national monument become a reality, some improvements in the units suggested, plus limited land acquisition, will be necessary as outlined below.

1. Land Acquisition

   Road Right-of-Ways: Acquisition of the private lands to provide access from the major highways to the Mascall Overlook, Sheep Rock, Turtle Cove, and the Foree Units.

   Administration: Acquisition of that portion of private land in Cottonwood Creek Valley located between the Mascall Overlook and Picture Gorge. The acquisition of additional private land in the Sheep Rock Unit is necessary for the development of an administrative site and a right-of-way for a river crossing between the present parking area and the fossil formation. At Clarno a good portion of outstanding formations now occurs outside of the existing State park. The boundaries of this area should be expanded and the private land involved purchased so as to include these formations in the proposed unit.

2. Development: Parking areas currently exist at all of the proposed units; however, they are inadequate and some enlargement and reconstruction is needed at each of them. A major visitor center and an administrative headquarters unit, including an office building, residences, and utility buildings, are proposed at the Sheep Rock Unit.

   At this unit, there is the problem of visitor crossing of the John Day River. Some type of facility, such as a tram or footbridge, will be needed. All development can be accommodated on the west side of the river along State Route 19 and the need for a vehicle bridge is not foreseen.

   Unmanned interpretive centers are proposed at all areas except Sheep Rock and the Cathedral Unit, with inplace exhibits planned at Turtle Cove and Foree. Nature and interpretive trails are proposed at Sheep Rock, Turtle Cove, and Clarno. Permanent quarters are proposed in the headquarters area, with seasonal quarters planned at the Turtle Cove and Clarno Units. A complete signing program, both within the national monument units and throughout the area will be necessary. This program should include both information and interpretive signing.

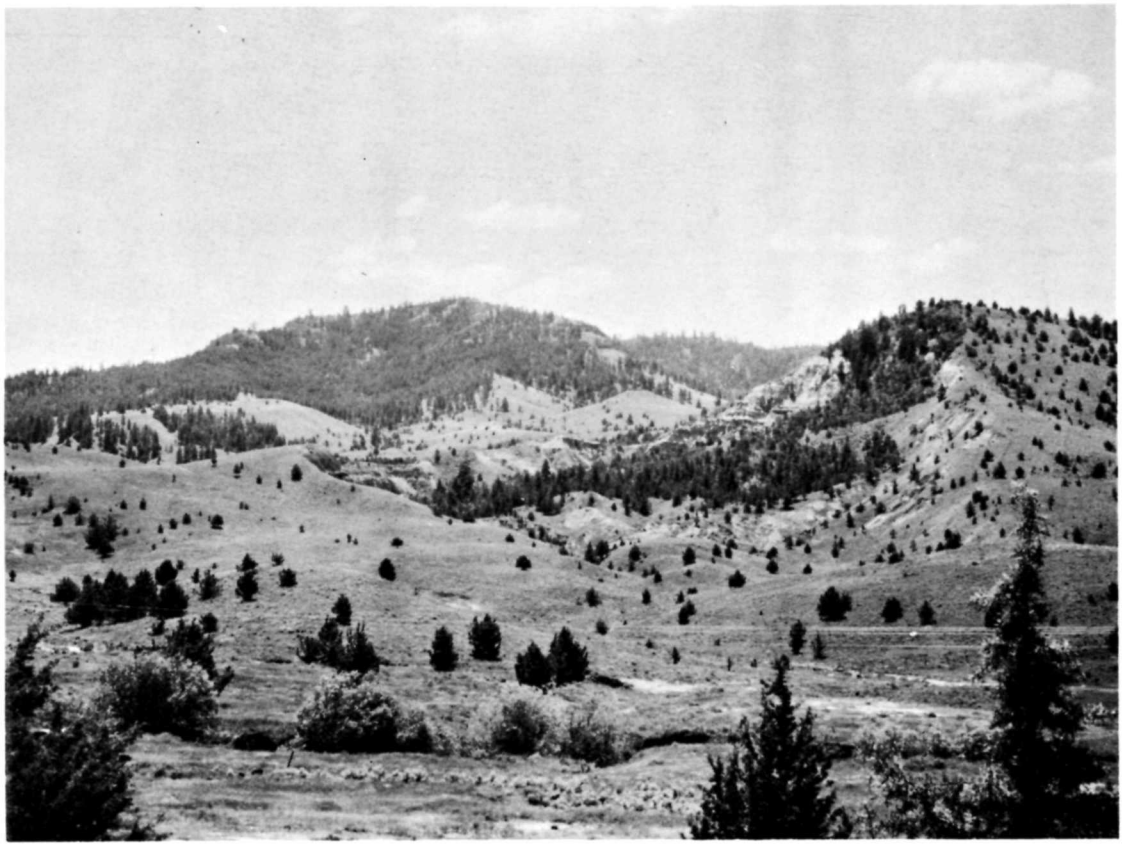
   All units will require fencing to protect them from existing noncompatible uses, such as livestock, hunting, and rock and fossil hunting.

A national monument as described above would be the minimum solution feasible in terms of National Park Service management, development, and interpretation. The alternative to this solution would be complete administration by the Oregon State Parks and Recreation Division. Under this alternative, the Service could be of valuable assistance to the Division, if requested, in the cooperative planning of a comprehensive interpretive program.

Several inter-connecting segments of the existing highway system afford opportunity for excellent loop tours that lead through the combination of sites, reduce back-tracking on the part of the visitor, and provide access to good camping facilities that are available at the high elevation forests out of the summer heat.

One such loop tour is afforded by State Route 19 from Picture Gorge on U.S. 26, north to Kimberly, west to Spray and Service Creek, then continuing south on State 207 to Mitchell and returning to U.S. 26.

A second example would be a loop tour along the same route as above to Kimberly, but then turning east on State 208 to Monument and Long Creek, then southward on U.S. 395 to Mt. Vernon and U.S. 26.



View of Sunken Mountain, adjacent to State Route 208 near Monument.

SUITABILITY AND FEASIBILITY

SUITABILITY

A series or combination of sites situated both in Grant and Wheeler Counties is suitable for geological and paleontological exhibit and interpretation as a John Day Fossil Beds National Monument. This conclusion is well documented and reinforced by the Shotwell Report.

FEASIBILITY

While geologic exposures like the Clarno, John Day, and the Columbia River Basalts occur frequently throughout Wheeler and western Grant Counties, units of the Oregon State Park System certainly contain some of the more significant exposures and, so far as is known, perhaps the core or the heart of the paleontological resources. Thus, the resources already are available for public use and benefits. It would not appear desirable or feasible to make changes in this present arrangement, especially since the State apparently does not wish to release its interest in the area at this time.

RECOMMENDATIONS

The national significance of the geological and paleontological resources of the Upper John Day River Basin is recognized. From preliminary studies, it appears that the area is suitable for establishment as a national monument. Because of feasibility factors, however, the area is not recommended for inclusion in the National Park System.

If the future situation indicates the need for further protection or if the State should actively seek national monument status for the resource, then additional study should be made at that time, looking toward the possibility of establishing a John Day Fossil Beds National Monument. In the meantime, National Park Service efforts should be directed toward offering the State planning or other assistance which will afford adequate protection and use of the resource.

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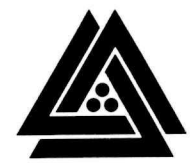

Parkscape U.S.A.