



## SELF-GUIDED TOUR OF THE HAGERMAN FOSSIL BEDS

This tour covers 10.5 miles and takes an hour or less to complete. There are no gas stations, food stores, trash containers, water fountains, or restrooms on the Monument. There are portable toilets at the Snake River Overlook and the Regional Trailhead. All natural objects are protected by law from collection or disturbance. This includes fossils, rocks, historical artifacts, and all plants and animals.

The map and information in the Monument's colored brochure may be helpful in finding your way. Directions for your drive are in **bold print and underlined**. Start at the National Park Service Visitor Center and **note your odometer or set your trip meter.**

### Stop 1 (mile 0.0) – Hagerman Fossil Beds Visitor Center

Although the Hagerman Fossil Beds contain the largest concentration of fossil horses in North America, the Monument is **internationally** significant because it protects the world's richest known fossil deposits from a time period called the late Pliocene Epoch. 105 vertebrate species (having a spinal column), 38 invertebrate species (like clams and snails), and 35 plant species (identified from pollen) have been found here. Of these, 44 are considered "holotypes", meaning that they were first identified here; 7 of these species are found nowhere else. These plants and animals represent the last glimpse of time that existed before the Ice Age, and the earliest appearances of modern flora and fauna.



The Monument was established in 1988 by Congress to preserve these outstanding paleontological resources for present and future generations. It is best known for the Hagerman Horse (*Equus simplicidens*), Idaho's state fossil. Today Paleontologists can tell from the teeth that this animal was not a true horse, but more closely related to the living Grevy's zebra of Africa. No one knows if the Hagerman "Horse" was striped. What do you think?

(mile 0.0) **Drive south through Hagerman on Highway 30.**

## THE ANCIENT ECOSYSTEM

The Monument contains an ancient ecosystem. Scientists say the fossil record of the earth goes back hundreds of millions of years; so the fossils found here at Hagerman are considered to be geologically recent. The Monument documents many kinds of change. The valley you are driving through was not here when the fossil beds were forming. The ground level was hundreds of feet above you! It was a much wetter environment then. This was a flood plain where numerous, unnamed rivers flowed into Lake Idaho which covered most of the southwestern part of the state. These rivers flooded regularly, like the Mississippi River today, into a body of water about the size of Lake Ontario. Lake Idaho drained into what is now the Pitt River, and later into the Klamath River drainage in California. What would have caused such major changes? The uplift of the volcanic Cascade Mountain range blocked the lake's outflow and forced the drainage northward. As Hell's Canyon eroded upstream, it began to drain Lake Idaho, scouring and deepening the canyon. Today, the Snake River drains through Hell's Canyon to the Columbia River and ultimately to the Pacific Ocean. It is called the Snake River because of its meandering course across the landscape.

## CANYON

Even though you are in a canyon, you might notice that you are driving on a huge gravel bar (mile 1.2) that was deposited by the Bonneville Flood (more about the flood later). The canyon is narrower up river because the basalt rocks there restrained the floodwaters.

## AGRICULTURE

Livestock ranching and crop farming (mile 2.0) commenced in the valley in the late 1800's, and has remained the primary land use. Alfalfa production is currently a major crop in this valley. Other crops include potatoes, corn, and sugar beets. Numerous dairy farms are now also found throughout the area.

## FISH FARMING



There are many private and government fish hatcheries in the valley (turnoff at mile 2.7) that produce trout and catfish. Idaho produces almost 70% of the commercial trout in the United States. Government hatcheries produce fish for stocking that are released into rivers throughout Idaho. Visitors are welcome at both the State and Federal hatcheries.

**Stop 2 (mile 3.4) - Turn into the Rest Area on the left.**

## REST AREA & WETLANDS

This should give you an idea what this region once looked like three and a half million years ago. **The rest area has the last available public restrooms and water, and has shaded picnic facilities.** It is also adjacent to the Hagerman Wildlife Management Area where there are more ponds. Trails weave through this area providing an excellent chance to view wildlife. Thousands of waterfowl use this area in the winter. The river and some lakes remain above freezing year-round because they are fed by springs. Listen for a frog in the water or for geese overhead. Try and spot a muskrat, swan, or water snake. These animals were here in the ancient past and just as real as they are today. Imagine ground sloths browsing on their favorite plants, or beavers weighing more than 100 pounds cutting and feeding on the trees adjacent to these wetlands. Animal life was abundant and diverse. Otters, ducks, and pelicans were also here as they are today.



**Turn left when leaving the Rest Area and continue south on Highway 30.**

## BONNEVILLE FLOOD

Notice the large, rounded boulders on both sides of the road (mile 3.7). These are river gravels called “melon gravels” that were left behind from the Bonneville Flood. Large sections of basalt rock fell from the canyon walls in the rush of water and tumbled downstream. Imagine the force needed to tumble these huge boulders along. When this flood reached the ancient soft sediments, the water widened the channel and formed this wide valley. The flood lasted about eight weeks, leaving behind the landscape before you. Only about 20 percent of the original Lake Bonneville remains today and is now called the Great Salt Lake in Utah; the Bonneville salt flats are part of the drained area. The event is clearly recorded here in the landscape.

## THOUSAND SPRINGS

On the left you’ll begin to notice, especially as you cross the bridge over the Snake River, the springs cascading down from the canyon walls. These are known as the Thousand Springs and flow naturally from the underground aquifer of the Snake River Plain. Geologists estimate that the aquifer contains enough water to cover the entire state of Idaho in 1½ inches of water! The emigrants traveling the Oregon Trail on the south side of the River often commented in their journals that it was frustrating to see but not be able to reach the springs.

**Turn at the first right (mile 4.8) immediately after the Snake River bridge onto the Bell Rapids Road and continue west along this paved road.**

### Stop 3 (mile 5.9) – HISTORIC BRIDGE - Owsley Bridge

At **mile 5.9**, look to the right for the historic Owsley Bridge across the Snake River, a suspended span, metal bridge built in 1920. Excavation parties from the Smithsonian Institution used this bridge to cross the Snake River. Please do not attempt to cross this one-way bridge in your own vehicle unless you are certain it will meet the size and load limitations. Watch for traffic coming from the other direction. In 19—the bridge was added to the National Historic Landmark list. There is a plaque on the other end of the bridge.

### UPPER SALMON DAM AND FALLS

Dams for power production along this stretch of the Snake River are not high structures. The Upper Salmon Falls Dam at **mile 6.2** primarily diverts water into the canal close to the road. These dams are not for water storage purposes, but only provide enough lift for the water to flow through the turbines and generate electricity.

The Upper Salmon Falls are a short distance downstream from the dam, and the flow is the greatest during spring runoff. As with the Bell Rapids (named for the pioneer Bell family whose descendants still live here in the Hagerman Valley), these falls were also important to the Shoshone, Bannock and Paiute tribes who lived here seasonally and fished for salmon and steelhead. These fish can no longer make the trip here from the ocean because of the dams placed along the River. The Bell Rapids are now covered by the Lower Salmon Falls Reservoir. Oregon Trail emigrant journals mention this campsite where they traded trinkets for dried salmon, a welcome alternative to the bacon they carried in their wagons.

### Stop 4 (mile 7.5) - SNAKE RIVER OVERLOOK

When you see the sign marking the Monument boundary, watch for the parking lot for the Snake River Overlook stop (**mile 7.5**) on your right. Please sign your name inside the register box. The boardwalk guides you a short distance to a viewing platform and is wheelchair accessible. Here you can get a closer view of the sedimentary layers and read the interpretive exhibits.

The bluffs in front of you are about 600 feet high. They consist of strata, or layers of sediments (sands, silts, and clays) deposited by the flooding of rivers flowing into ancient Lake Idaho. Scientists estimate these sediments were deposited more than three million years ago. This is one of two different ecological periods evident here. Each layer represents a different geologic event. At various times during the deposition of these sediments, distant and nearby volcanoes erupted ash and flows of lava that are now preserved as distinct layers within the Glens Ferry Formation. There are many other layers below this formation that have **not** been exposed. The animals that died and were buried within the Glens Ferry Formation were most likely quickly buried by sediments and became fossilized slowly. Scientists say the exposed layers are a biological time capsule containing 1 million years of earth history during the late Pliocene Epoch known as the Blancan time period. The large number and diversity of fossils found here provide a glimpse into life as it once existed, a rare opportunity to understand changes in the environment, and how life forms reacted to those changes.

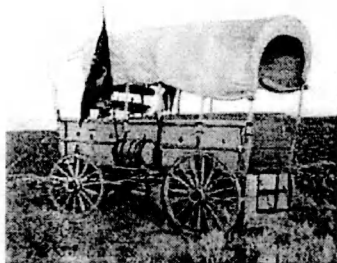
The only reason you can now see these layers is that the Snake River **cut down** through the ancient flood plain sediments when Lake Bonneville overflowed its rim about 15,000 years ago in southeastern Idaho near the present day city of Pocatello. This is the second ecological period you can experience here. The Bonneville Flood lasted about eight weeks and carved out the valley before you. It is unrelated to the periodic floods that **deposited** the layers of sediments in the bluffs.

## LANDSLIDES

Over the last 25 years, huge landslides have been scouring out the sheer cliffs and tumbling millions of cubic feet of debris downslope. Water seepage from unlined irrigation canals saturates the soft sediments. Eventually, the saturated layers reach a point where they cannot support the weight above, and an entire slope collapses in a sudden rush of mud. Similar displacement occurs where water from the reservoir saturates the base of the slope, and material slumps into the reservoir. While landslides have occurred in this region in the past as a result of natural forces, the size and frequency of the slides has increased due to this unnatural saturation in more recent times. Landslides can displace fossils, destroying scientific information about how and when they were deposited. The National Park Service is working with the irrigation company on top of the bluffs to reach a solution to canal seepage, and with Idaho Power regarding the shoreline.

## EMIGRANT TRAIL

Directly across the street from the parking lot at the Snake River Overlook is the trailhead for the Emigrant Trail. Please sign your name inside the register box at the base of the hill if you are hiking. The box also contains a guide to the trail with excerpts from the diaries of emigrants as they traveled through this area. Would you have made such a journey? Park a vehicle at the Oregon Trail Overlook (for the return trip; mile 10.3) and walk this 3 mile trail to decide for yourself.



## OREGON TRAIL

You can walk out to the wagon ruts when you arrive at the Oregon Trail Overlook, but in the meantime, you can also see segments of the trail as you drive. The Oregon Trail parallels the road you've been driving on since you crossed the Snake River. This meandering path of 400,000 emigrants remains eroded on the Monument landscape today.

**PLEASE**, do not stop along the roadway because there is heavy truck traffic. The **road shoulders** are **soft** and **vehicles** can easily **get stuck**.

By the time the emigrants reached this area, usually in July, most had **WALKED** 1,300 miles! The emigrants risked everything, including death. Summertime temperatures here usually reach 100 degrees. Dust was thick and choking. The westward migration along the Oregon Trail is generally regarded as the largest peacetime migration in U.S. history.

**Turn right to depart the Snake River Overlook parking lot.**

Just after you leave the parking lot, the road is built on top of the Oregon Trail. You will cross a very narrow portion of the ridge that the emigrants called the “Devil’s Backbone” with the Snake River precariously on the right and a canyon on the left. There was barely a wagon’s-width here, so only those who had to ride in the wagon did so. To make it wide enough for modern vehicles, road crews had to add “fill” dirt. To avoid this spot, some wagons likely traveled up the more difficult canyon on your left.

**The trail ruts are marked with white fiberglass stakes.** The first one is to your left as you go up the road at mile 8.1. You’ll see many of these white stakes marking the remaining trail ruts; most are on your left. Most people expect to see the two parallel ruts of the wheels, but this usually occurs where a hard surface like sandstone was downcut by the steel rims. Here, they are U-shaped because the oxens’ feet dug more deeply into the soft soils than the wheels did. Approaching the top of the bluff, the trail grade was so steep that the ox teams probably were disconnected from some wagons and hooked to others to “double team” the wagons up the slope.

### **Stop 5 (mile 10.3) - OREGON TRAIL OVERLOOK**

At the top of the grade (**mile 10.3**) enter the parking area on your left for a stop at the Oregon Trail Overlook. This half-mile loop trail has commanding views of the Snake River Plain, interpretive wayside exhibits, and is wheel chair accessible. Please sign in at the register box, which is adjacent to the Oregon Trail. For your own safety and to preserve the historic trail, **stay on the pathway**. It is often windy on top of the plateau, so be prepared for variable weather conditions.

It must have been difficult for the emigrants to leave the abundant water of the Snake River for the dry sagebrush terrain again. With the steep climb behind them, two days of travel lay ahead without water to the Three Island Crossing (now a State Park) of the Snake River.

### **PROTECT AND ENJOY**

We hope you enjoyed this self-guided tour. Return to our Visitor Center for an audio/visual presentation about the Fossil Beds and to view the fossils on display!

A site closer to the Monument and next to the Snake River has been purchased in order to build a permanent Research Center and Museum for the Hagerman Fossil Beds. When constructed, it will offer superb educational opportunities for the public as well as the scientific community. Active research will go beyond treating fossils as trophies, but rather as tools of discovery that offer a window into the past. Visitors will be directly involved with this learning and discovery process. If you would like to know more about proposed trails and facilities, ask for a free copy of our General Management Plan. Come back again to see how we’ve grown.

**Turn right out of the parking lot and return along the same route you just traveled.**

For those who want to experience more of the monument, outstanding views of the Snake River and the Hagerman Valley by hiking, horseback riding or mountain biking:



"Let's move it folks.... Nothing to see here....  
It's all over.... Move it along folks .... Let's go,  
let's go..."

From "The Far Side" 2001

#### **"BEET DUMP"**

**At the intersection with the gravel and paved roads (mile 11.4), continue straight onto the gravel road (400 East).**

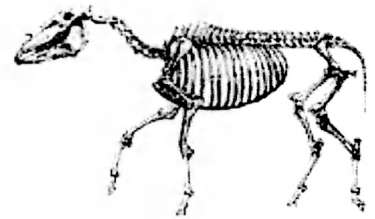
The graded pad at this intersection is used in the fall during the harvest of sugar beets as a transfer point from the fields to processing plants. The roads beyond become rough and there are no signs to direct you. Please respect the rights of private property owners in this area.

**Continue north on 400 East, a gravel road, for 2 miles. At 5600 North, turn right and head east for 0.8 miles to the trailhead.**

Do not drive beyond the parking area. Please obtain a brochure at the regional trailhead, sign the register box, and read all of the instructions. No fossils or sites are on display along the trails. There are limited facilities at the trailhead and none along the trails.

## SUMMER TOURS

During the summer season, park rangers lead tours to the famous Horse Quarry where the Smithsonian Institution lead four excavations, removing over 150 horse skulls and about twenty complete horse skeletons. The first excavation began in 1929, with later excavations in 1930, 1931 and 1934. Many of the bones uncovered here by the Smithsonian were exchanged with other scientific groups, making Hagerman internationally famous. Hagerman horses can still be seen today on display in museums in Washington D.C., Pittsburgh, Denver, Chicago, and in Copenhagen.



You may have wondered, “Why were there so many horses found here?” An early theory suggested the site was once a watering hole where the elderly animals went to die. However, the horses excavated include animals of **all ages**. Also, there were no chew marks on the bones, which would have resulted had predators and scavengers been eating the dying and dead animals. More recent scientific investigations suggested that the fossil bones excavated here were from an entire herd that may have been drowned in one of the swollen, flooding rivers associated with ancient Lake Idaho. Their bodies could have been washed into an eddy and quickly buried there. This theory may be supported by the nature of the surrounding sediments which display characteristics associated with cross-bedding (sands and gravels deposited by flowing water in a stream channel). The presence of so many complete skeletons may complicate this explanation. Paleontologists today continue their research into this, and other important questions.

In addition to the Horse Quarry, the Smithsonian Institution conducted excavations in other parts of what is today the Monument area. Many specimens from a variety of species were uncovered, including beaver, muskrat, rabbit, frog, and swan.

Institutions that later conducted research in the Hagerman area include the University of Michigan, the Natural History Museum of Los Angeles County, and the Idaho Museum of Natural History (Idaho State University).



*For Additional information contact:*  
**Hagerman Fossil Beds National Monument**  
221 North State Street, P.O. Box 570  
Hagerman, Idaho 83332  
208-837-4793  
<http://www.nps.gov/hafo>