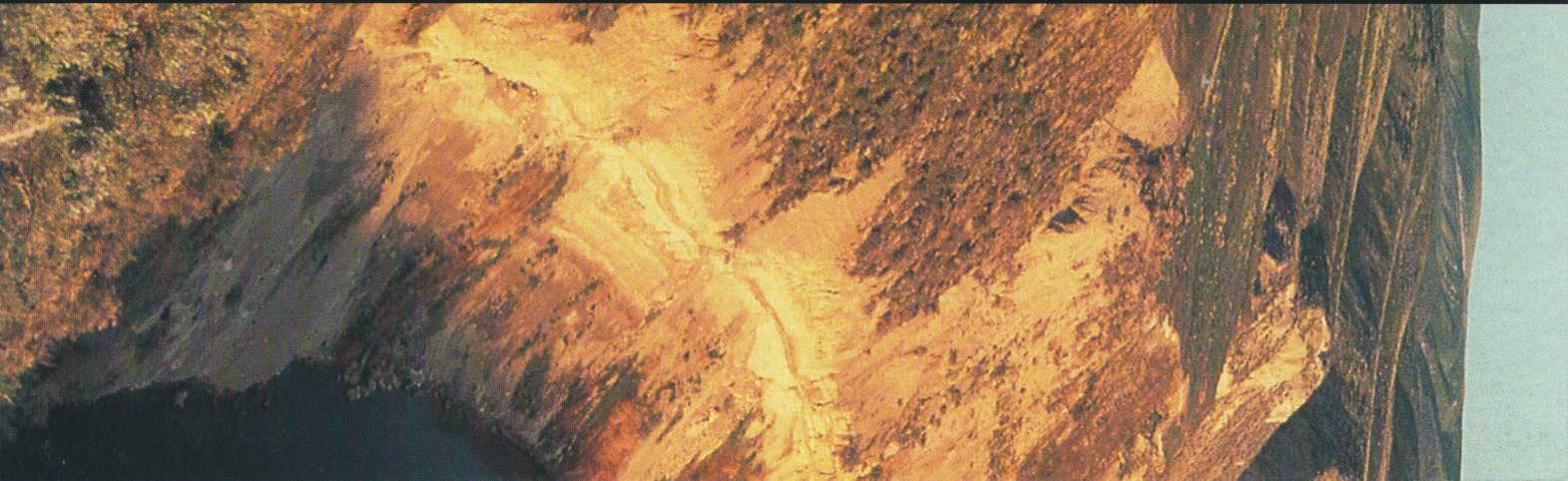
Hagerman Fossil Beds

National Monument
Idaho

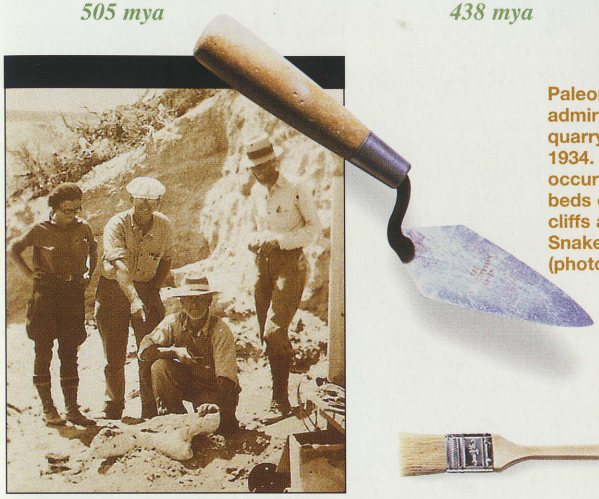
National Park Service
U.S. Department of the Interior

Official Map and Guide



Smithsonian Institution

Hagerman Fossil Beds National Monument is most famous for the horse that is Idaho's state fossil. It is most significant for its variety, quantity, and quality of fossils, evidence of animals or plants present in the Earth's crust.

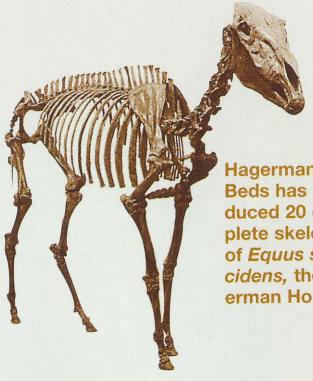


Paleontologists admire one of the quarry's fossils in 1934. The fossils occur in layered beds exposed in cliffs above the Snake River (photo at right).

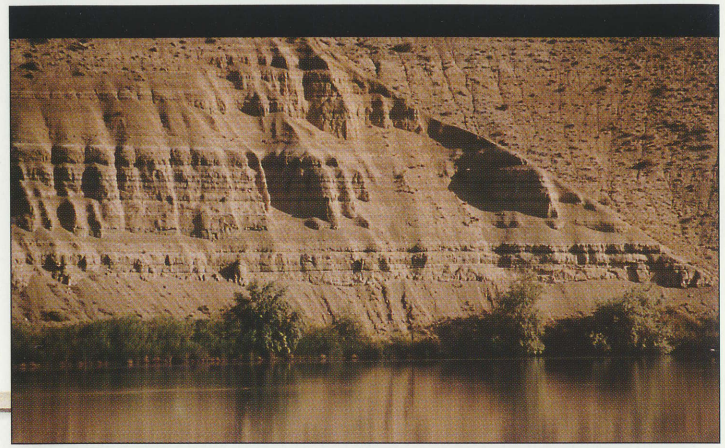
What the Scientists Found Here

No other fossil beds preserve such varied land and aquatic species from the time period called the Pliocene Epoch. More than 140 animal species of both vertebrates and invertebrates and 35 plant species have been found in hundreds of individual fossil sites. Eight species are found nowhere else, and 44 were found here first. The Hagerman Horse, *Equus simplicidens*, exemplifies the quality of fossils. From these fossil beds have come both complete and partial skeletons of this zebra-like ancestor of today's horse.

In 1929, paleontologists from the Smithsonian Institution in Washington, D.C., made the first scientific excavations at Hagerman Fossil Beds. A local rancher, Elmer Cook, had shown the fossil beds to a government geologist, Dr. Harold Stearns. The Smithsonian finds led to more expeditions in the 1930s. Its National Museum of Natural History excavated 120 horse skulls and 20 complete skeletons from an area called the Horse Quarry. The Smithsonian exchanged some of these Hagerman Horse skeletons with other museums, which has resulted in their display around the world. Additional scientific expeditions have been conducted over the years by other museums and universities. More than 200 published scientific papers focus on the Hagerman fossil species.



Hagerman Fossil Beds has produced 20 complete skeletons of *Equus simplicidens*, the Hagerman Horse.



Clues in the Landscape

The 600-foot-high bluffs rising above the Snake River and comprising the Hagerman Fossil Beds reveal the environment at the end of the Pliocene Epoch. Grassy plains dotted with ponds and forest stands then received over twice today's 10 inches of yearly precipitation. Mastodons, sabre-tooth cats, beavers, muskrats, otters, camels, antelope, deer, ground sloths, hyena-like dogs, and fish, frogs, snakes, and waterfowl lived here. The sediment layers from river level to bluff tops span some 550,000 years: from 3.7 million years old at river level to 3.15 million years old atop the bluff. These layers were deposited when rivers flowing into ancient Lake Idaho flooded the countryside. The much later Bonneville Flood, 15,000 years ago, carved the high bluffs, exposing the layers and fossils. This flood also deposited fields of so-called melon gravel—lava boulders ranging in size from a compact car to watermelons—from today's river level to gravel bars 225 feet higher.

The sediments in the bluffs include river sands, thin shale layers deposited in ponds, clay flood deposits, and occasional volcanic deposits such as ash and basalt. It is the radioactive elements such as potassium 40 in the volcanic ashes that allowed scientists to determine the age of the fossils by measuring the rate at which one radioactive element breaks down into another.

This Hagerman Horse skull, now in the collection of the Smithsonian Institution, closely resembles that of today's zebra.

Smithsonian Institution

Jay H. Matternes

In Pliocene times the climate was more wet here and the vegetation far more lush, as shown in the painting at left.

Adapt, Migrate, or Become Extinct

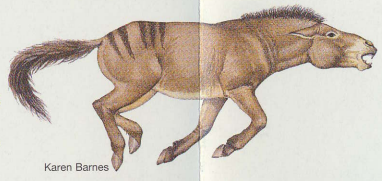
When significant environmental change occurs, most plants and animals have three options; adapt, migrate, or become extinct. The ancient ecosystem represented by fossil plants and animals illustrates each response as the region changed from a wetter grassland savanna to the drier high-desert conditions of today. **Adapted:** Hagerman's beaver and muskrat and many birds are similar or ancestral to today's species. **Migrated:** Llamas migrated to South America, while camels and horses traveled across the Bering Land Bridge to Eurasia. **Extinct:** Ground sloths became extinct, along with mastodons and other large herbivores. With the disappearance of their primary prey, sabre-tooth cats and hyena-like dogs also became extinct.

Hagerman Fossil Beds is one of the few sites that preserves the necessary variety and quantity of fossil evidence to study past climates and ancient ecosystems. Fossil studies also add to contemporary research on biodiversity, wetlands ecology, and evolutionary patterns.

Adapted:
Beaver that lived here in Pliocene times adapted to change, and their descendents live here today.

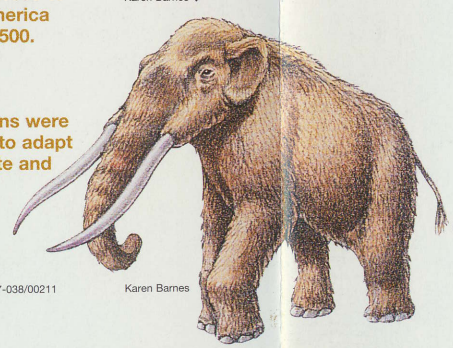
National Geographic Society

Migrated:
Horses migrated to Eurasia when habitat conditions changed here. Spaniards reintroduced horses to North America around 1500.



Karen Barnes

Extinct:
Mastodons were not able to adapt or migrate and became extinct.



Karen Barnes

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Epochs of the C E N O Z O I C

Holocene *present*

Horses reintroduced into North America by Spanish *1500's*
Extinction of North American megafauna, including horses *11,000 - 10,000 BP*
Bonneville Flood *15,000 BP*
Damming of Snake River by McKinney Butte Basalt *50,000 BP*
Immigration of bison into North America from Eurasia *400,000 BP*
Lake Idaho drains *1.7 mya*
Immigration of mammoth into North America from Eurasia *1.9 mya*

Pleistocene *2 mya*

First appearance of modern horse *Equus* at Hagerman *3.2 mya*
Volcanic eruption at Yellowstone deposits Peters Gulch Ash at Hagerman *3.7 mya*
Ancestral Snake River begins depositing sediments at Hagerman *4 mya*
First appearance of modern beaver, *Castor* *4.8 mya*
Extinction of rhinos in North America *4.8 mya*

Pliocene *5 mya*

Banbury Basalt forms floor of what is now the Hagerman Valley *8 - 11 mya*
Bruneau-Jarbidge eruption south of Hagerman deposits ash as far east as Nebraska *11 mya*
First elephants *(gomphotheres)* immigrate into North America from Eurasia *14.5 mya*

Miocene *25 mya*

Gap in the record
First appearance of beavers *35 mya*

Oligocene *38 mya*

Volcanism in the Challis area begins *51 mya*

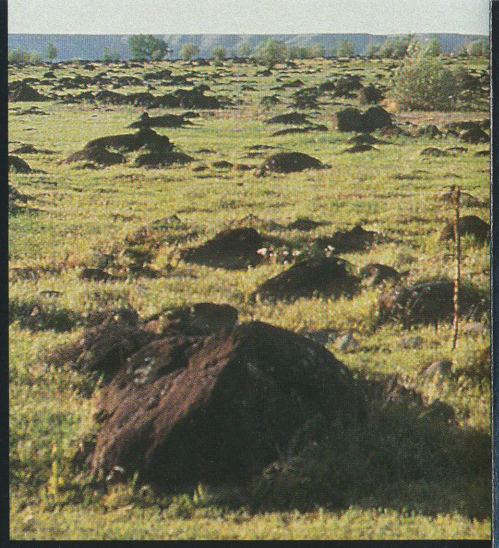
Eocene *55 mya*

First horse, *Hyracotherium* *57.5 mya*

Paleocene *65 mya*

Extinction of dinosaurs *65 mya*
Gap in the record

Hagerman Fossil Beds



Colossal flooding through the valley of the Snake River 15,000 years ago tumbled rocks from the size of watermelons to compact cars and deposited them in today's Hagerman Valley. Flood waters also exposed the layers and fossils of Hagerman Fossil Beds in the bluffs above the Snake River.

From the visitor center in Hagerman you can look across the Snake River to the bluffs that hold a wealth of fossils. From river level to the top of the bluffs the fossil record spans 550,000 years.

Many species of birds and other animals that today frequent the Snake River's banks and nearby wetlands are similar to those fossilized in the bluffs.

Native vegetation of the Hagerman area typifies species adapted to high desert conditions. Sagebrush and rabbit brush dominate along with grasses.

History of the Hagerman Area

Native American peoples now called the Shoshone-Bannock and Shoshone-Paiute tribes have lived in the Hagerman Valley for some 1,200 years. From the rich fishery they caught and dried salmon, steelhead trout, whitefish, and other fish, including sturgeon weighing 1,500 pounds or more. They dug camas-lily and other roots for food and harvested various seeds, fruits, and other plants. They hunted mostly small game but also mountain sheep, elk, deer, and bison.

Pristine segments of the Oregon Trail are located in the southern portion of the monument. The Snake River Plain was a difficult stretch for emigrants struggling to make their way west. Intense summer heat, dust, wind, and lack of water made the crossing of this sagebrush plain an ordeal. The Hagerman Valley was one of the few places where the Snake River Canyon was accessible and where emigrants could trade for fish with Native Americans. Another 700 miles of arduous travel lay ahead.

The Idaho gold rush in 1862 brought an increase in both freight and stage traffic on the Oregon Trail. Trains of freight wagons hauling up to 5 tons each brought in goods to supply short-lived Army camps, mines, and developing towns. A few ranchers settled here after that. Farming in the valley began in 1879, with alfalfa growing by John Bell. In 1882, the Oregon Short Line railroad arrived north of the valley, and farming settlement increased. Farming continues today with sugar beets and potatoes as major crops.

Bounded on the east by basalt cliffs formed from past lava flows, the valley boasts many springs. Their water exits the ground at a consistent temperature ideal for raising trout commercially. The springs also keep the river from freezing in winter, so migrating waterfowl winter over here.

Visiting the National Monument

A temporary visitor center offers information and fossil displays across from Hagerman High School along U.S. Highway 30 in town (221 N. State Street) from 8:30 a.m. to 5 p.m. daily in summer. At other times call ahead, (208) 837-4793, for hours of operation. Schedules of educational programs are listed in *The Fossil Record* newsletter. For more information write to: Superintendent, Hagerman Fossil Beds National Monument, P.O. Box 570, Hagerman, ID 83332.

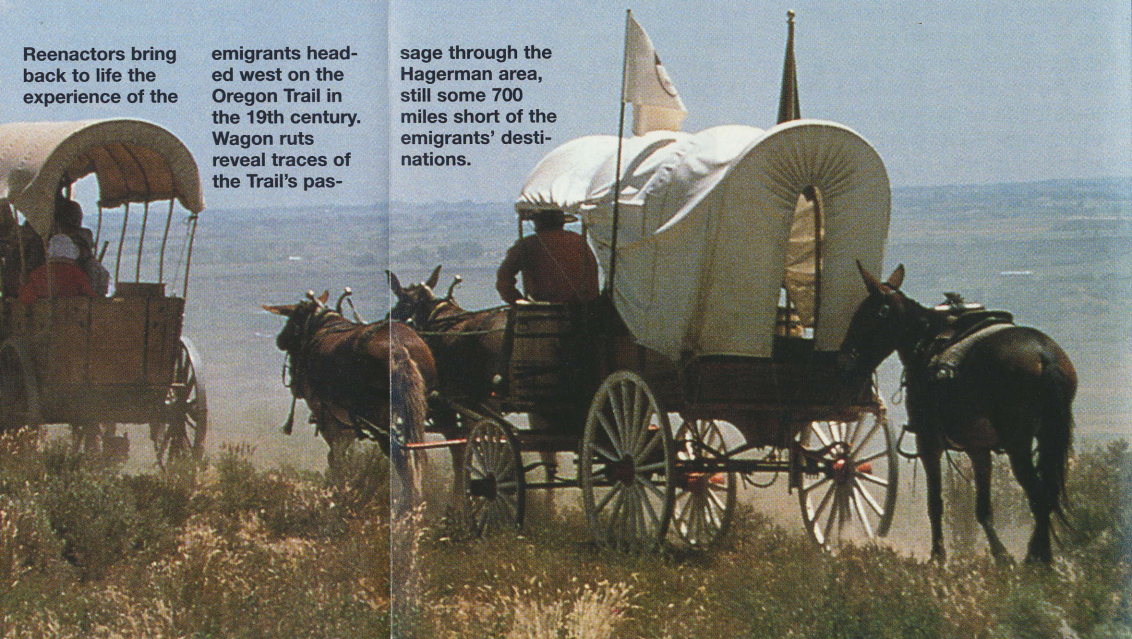
For an easy view of the monument, drive south from Hagerman on Highway 30 past the road to Wendell and take the next right turn (0.25 mile), marked "Sportsman's Access." Follow the signs to the Bell Rapids boat dock on the Snake River for fishing, water sports, or viewing birds along the scenic shoreline. The 4,281-acre monument, across the river, includes 7 miles of shoreline.

On Monument Land To reach a wheelchair accessible boardwalk overlook, continue south on Highway 30 and cross the Snake River. Turn right on Bell Rapids road and continue 2.8 miles. The parking lot is on the right, one tenth of a mile after you enter the monument. The boardwalk with wayside exhibits provides a commanding view of the fossil beds and Snake River and is a good place to watch waterfowl. Farther along this road white stakes mark the historic Oregon Trail. Another wayside exhibit is planned for the top of this grade.

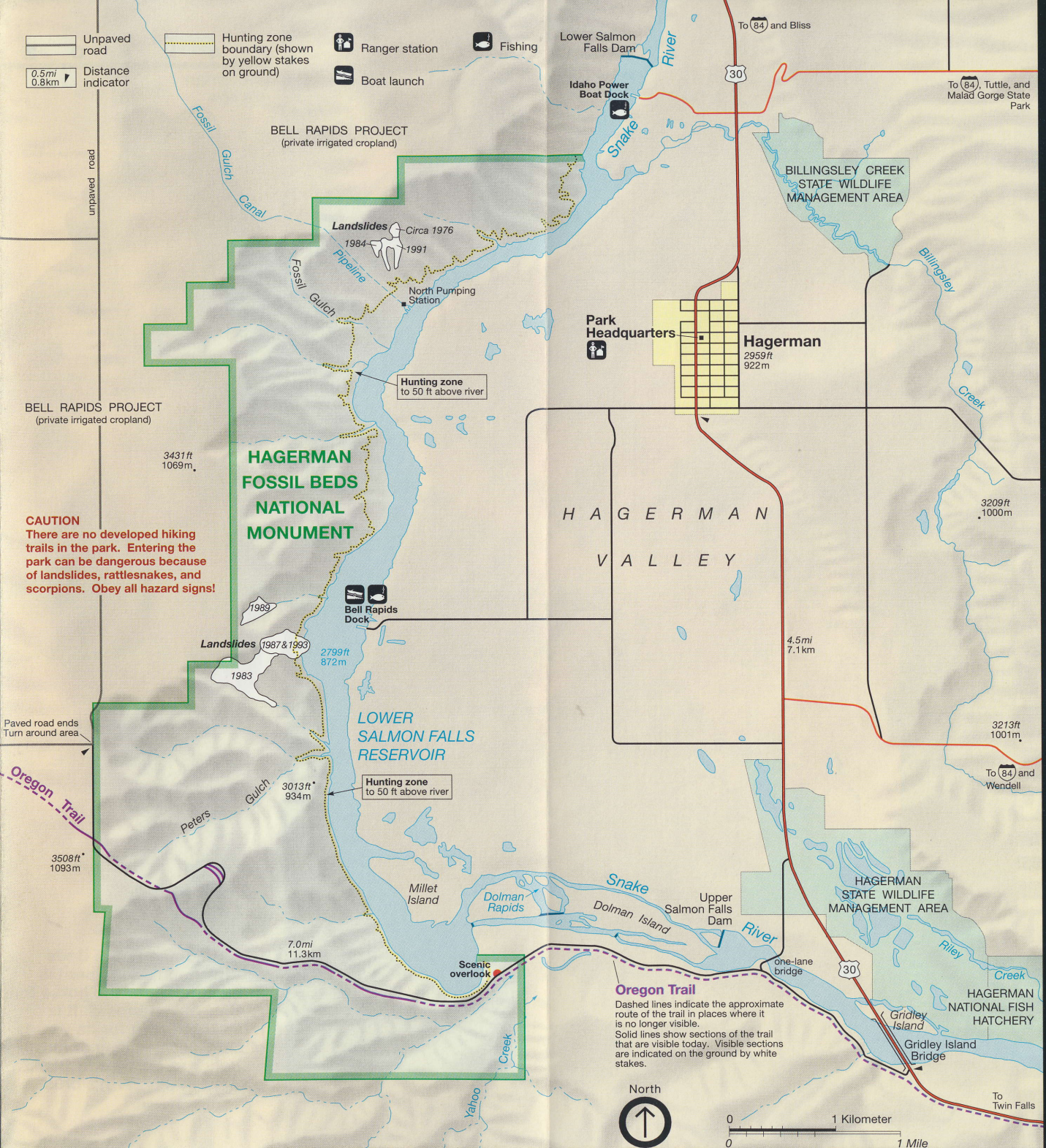
At points along the road there are nice views of the Snake River, Hagerman Valley, and the slopes exposing the fossil beds. You should return along this same road. Before driving this or any other road in the monument, please check at the visitor center for complete directions, important safety warnings, and private property restrictions. Other improvements for visitor enjoyment are underway and in planning stages.

Regulations and Safety Do not move or take any fossil, rock, or plant. All plants and animals are protected by law, even rattlesnakes and scorpions and other noxious insects. Beware and give them room. Some areas are closed to public use. Check with a ranger before venturing out.

If you see a fossil, please do not pick it up; report its location to a ranger so important information can be gathered. Many fossils are fragile and must be protected by trained experts before they can be moved safely.



Reenactors bring back to life the experience of the emigrants headed west on the Oregon Trail in the 19th century. Wagon ruts reveal traces of the Trail's passage through the Hagerman area, still some 700 miles short of the emigrants' destinations.


Unpaved road
Distance indicator
0.5mi 0.8km
Hunting zone boundary (shown by yellow stakes on ground)
Ranger station
Boat launch
Fishing
Lower Salmon Falls Dam
Idaho Power Boat Dock
To 84 and Bliss
To 84, Tuttle, and Malad Gorge State Park
30
Snake River
Fossil Gulch Canal
BELL RAPIDS PROJECT
(private irrigated cropland)
unpaved road
BILLINGSLEY CREEK STATE WILDLIFE MANAGEMENT AREA
Billingsley Creek
Landslides
Circa 1976
1984
1991
Fossil Gulch Pipeline
North Pumping Station
Park Headquarters
Hagerman
2959ft
922m
Hunting zone to 50 ft above river
BELL RAPIDS PROJECT
(private irrigated cropland)
3431ft
1069m
HAGERMAN FOSSIL BEDS NATIONAL MONUMENT
CAUTION
There are no developed hiking trails in the park. Entering the park can be dangerous because of landslides, rattlesnakes, and scorpions. Obey all hazard signs!
HAGERMAN VALLEY
3209ft
1000m
1989
Bell Rapids Dock
Landslides
1987 & 1993
1983
2799ft
872m
4.5mi
7.1km
LOWER SALMON FALLS RESERVOIR
3213ft
1001m
To 84 and Wendell
Paved road ends
Turn around area
Oregon Trail
Peters Gulch
3013ft
934m
Hunting zone to 50 ft above river
3508ft
1093m
Millet Island
Dolman Rapids
Snake River
Dolman Island
Upper Salmon Falls Dam
HAGERMAN STATE WILDLIFE MANAGEMENT AREA
7.0mi
11.3km
Scenic overlook
one-lane bridge
30
Riley Creek
HAGERMAN NATIONAL FISH HATCHERY
Gridley Island
Gridley Island Bridge
Yahoo Creek
Oregon Trail
Dashed lines indicate the approximate route of the trail in places where it is no longer visible.
Solid lines show sections of the trail that are visible today. Visible sections are indicated on the ground by white stakes.
To Twin Falls
North
0 1 Kilometer
0 1 Mile