

Hagerman Fossil Beds

PALEOZOIC

Cambrian
590 mya

Ordovician
505 mya

Silurian
438 mya

Devonian
408 mya

Carboniferous
320 mya

Permian
286 mya

MESOZOIC

Triassic
248 mya

Jurassic
213 mya

Cretaceous
144 mya

CENOZOIC

Paleocene

Eocene

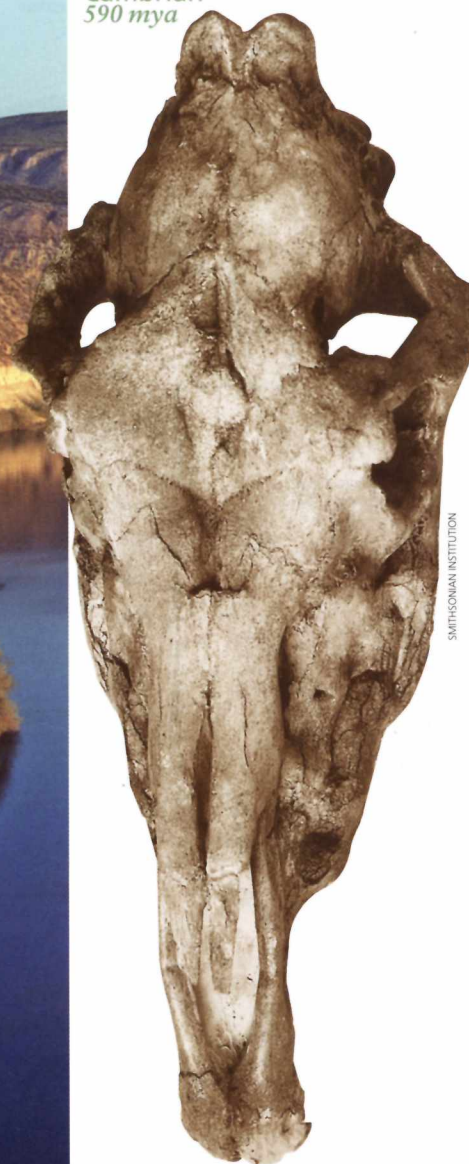
Oligocene

Miocene

Pliocene

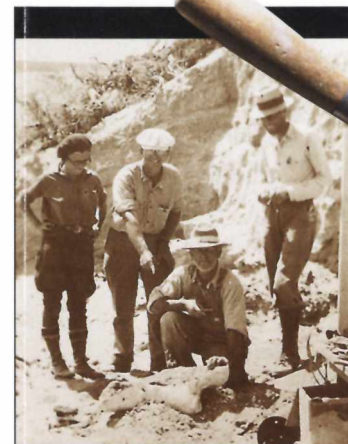
Pleistocene

Holocene



Hagerman Fossil Beds National Monument, in Idaho, is most famous for the Hagerman Horse, which is also the state fossil. The monument is significant for its variety, quantity, and quality of animal and plant fossils.

PHOTOGRAPHS NPS UNLESS OTHERWISE CREDITED



Paleontologists admire one of the quarry's fossils in 1934 (left). The fossils occur in layered beds exposed in cliffs above the Snake River (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. Over 200 species of plants and animals have been found at hundreds of sites in this park. Eight species are found only here, and 43 were found here first. The Hagerman horse, *Equus simplicidens*, typifies the fossil quality. Complete and partial skeletons of this zebra-like ancestor of today's horse have come from these fossil beds.

Paleontologists from the Smithsonian Institution in Washington, DC, made the first scientific excavations here in 1929. Local rancher Elmer Cook had shown the fossil beds to a government geologist, Dr. Harold Stearns. During the 1930s, the Smithsonian scientists excavated

120 horse skulls and 20 complete skeletons from an area now called the Horse Quarry. The Smithsonian exchanged some Hagerman horse skeletons with other museums, resulting in their display around the world. Other museums, universities, and the National Park Service have now done work here. Over 200 scientific papers now focus on the Hagerman fossil species.



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



Clues in the Landscape

Bluffs that contain Hagerman Fossil Beds rise 600 feet above the Snake River. They reveal the environment at the end of the Pliocene Epoch. Grassy plains with ponds and forest stands then received over twice today's 7–10 inches of annual precipitation. Saber-toothed cats, mastodons, camels, ground sloths, hyena-like dogs, beavers, muskrats, otters, antelope, deer, fish, frogs, snakes, and waterfowl lived then.

Sediment layers from river to bluff tops span 550,000 years: 3.7 million years old at river level to 3.15 million years



The Hagerman Horse probably is more closely related to Grevy's zebra than the horse. Scientists conclude this because its skull (left) looks very much like a zebra's. Scientists also speculate the Hagerman Horse may have had stripes.

SMITHSONIAN INSTITUTION

atop the bluff. The layers were deposited when rivers flowing into ancient Lake Idaho flooded the area. The Bonneville Flood 15,000 years ago carved the high bluffs, exposing the layers and fossils. It also deposited fields of melon gravel—lava boulders the size of watermelons and larger—from today's river level to gravel bars 225 feet higher. Sediments include river sands, shale deposited in ponds, clay from floods, and volcanic deposits like ash and basalt. Radioactive elements in volcanic ashes are used to determine a fossil's age.

Adapt, Migrate, or Become Extinct

As significant environmental change happens, most plants and animals will have three options: adapt, migrate, or become extinct. The ancient ecosystem of Hagerman's fossil plants and animals shows each response as the area changed from a wetter grassland savanna to today's drier high-desert conditions.

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

Adapted
Beavers that lived here in Pliocene times adapted to change, and their descendants live here today. Muskrat and many birds also adapted.



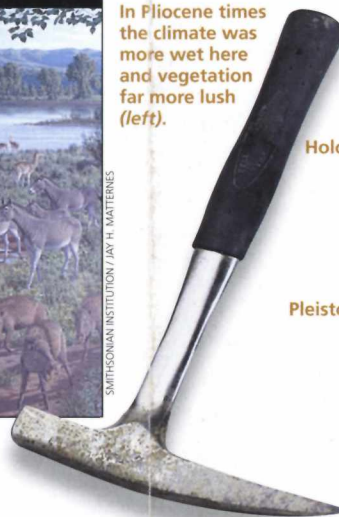
Migrated
Horses migrated to Eurasia when habitat conditions changed here. Camels also migrated to Eurasia. Llamas migrated to South America.



Became Extinct
Mastodons were not able to adapt or migrate, so they died out. Ground sloths, hyena-like dogs, and saber-toothed cats also became extinct.



In Pliocene times the climate was more wet here and vegetation far more lush (left).



Epochs of the CENOZOIC

Holocene 11,700 Before Present (BP) to present ▼
Horses reintroduced into North America by Spanish 1500s
Extinction of North American megafauna, including horses 13–10,000 BP

Pleistocene 2.6 mya–11,700 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 million years ago
Immigration of mammoth into North America from Eurasia 1.8–1.6 mya

Pliocene 5.3–2.6 mya ▼
First appearance of modern horse (*Equus*) at Hagerman 3.2 mya
Volcanic eruption at Yellowstone deposits Peters Gulch Ash at Hagerman 3.9 mya
Ancestral Snake River begins depositing sediments at Hagerman 4.3 mya
First appearance of modern beaver (*Castor*) 4.8 mya

Miocene 23–5.3 mya ▼
Banbury Basalt forms floor of what is now the Hagerman Valley 8–11 mya
Bruneau-Jarvis eruption southwest of Hagerman deposits ash as far east as Nebraska 11 mya
Gomphotheres (early elephants) immigrate into North America from Eurasia 14.5 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

BEAVER—NATIONAL GEOGRAPHIC SOCIETY; HORSE AND MASTODON—NPS / KAREN BARNES

Hagerman Fossil Beds



Colossal flooding through the Snake River Valley 15,000 years ago left rocks from the size of watermelons to small cars in what is now Hagerman Valley. Flood waters also exposed the layers and fossils of Hagerman Fossil Beds in the bluffs above the Snake River.



Look for the tall sandhill crane along the river or flying overhead. Listen too for its warbling call. Fossils of a similar bird have been found at Hagerman.



Native vegetation of the Hagerman area typifies species adapted to high desert conditions. Sagebrush, rabbitbrush, and grasses dominate this dry land.

ALL PHOTOGRAPHS NPS

Indians, Emigrants, and Farmers

American Indians now known as the Shoshone-Bannocks and the Shoshone-Paiutes have lived in the Hagerman Valley for 12,000 years. They caught and dried salmon, steelhead trout, whitefish, and other fish—including sturgeon weighing over 1,500 pounds. They dug camas lily and other roots and harvested seeds, fruits, and other plants. They hunted small animals and deer, elk, and mountain sheep.

Well-preserved segments of the Oregon Trail exist in the southern part of the monument. Intense summer heat, dust, wind, and lack of water made crossing the Snake River Plain an ordeal. The Hagerman Valley was one of the few places where emigrants could reach the Snake River for water and to trade for fish with American Indians. Another 700 miles of arduous travel lay between here and their destination.

In 1862, the Idaho gold rush increased traffic on the Oregon Trail. Trains of freight wagons hauling up to five tons each brought supplies to Army camps, mines, and developing towns. A few ranchers settled here later. Farming began in the valley in 1879, with John Bell growing alfalfa. In 1882, the Oregon Short Line railroad arrived north of the valley, and farming settlement increased. Today's farmers grow corn and potatoes as the 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 that is ideal for raising trout. Because the springs also keep the wetlands from freezing in winter, many migrating waterfowl spend the winter here.

Visiting the National Monument

The visitor center is across from the high school on US 30 (221 N. State Street). It offers information, exhibits, displays, and a bookstore. Open 9 to 5 seasonally; call ahead or check the park website for the schedule. Ranger-led programs are listed on the website.

To reach overlooks, drive south on US 30 and cross the Snake River on the Gridley Island Bridge (see map). Turn right on Bell Rapids Road and drive 2.8 miles. The Snake River Overlook is on the right, 0.10 mile after you enter the monument. The boardwalk has exhibits and provides a view of the fossil beds and Snake River. Cross the road to an exhibit about the Oregon Trail; follow the path to see the famous trail.

Continue up the road for three miles to reach the Oregon Trail Overlook. Walk the half-mile

interpretive trail to enjoy commanding views. You can also start the Emigrant Trail here. This three-mile trail parallels the Oregon Trail.

Regulations and Safety
Check at the visitor center before driving in the monument to find out which areas are open to the public and if safety restrictions are in place.

For firearms regulations, check the park website.

All natural and historic features are protected by federal law. Do not take, disturb, or damage any fossil. If you find a fossil, leave it in place and report it to a ranger. Many fossils are fragile and must be protected by trained experts before they can be moved safely.

Emergencies call 911

Accessibility

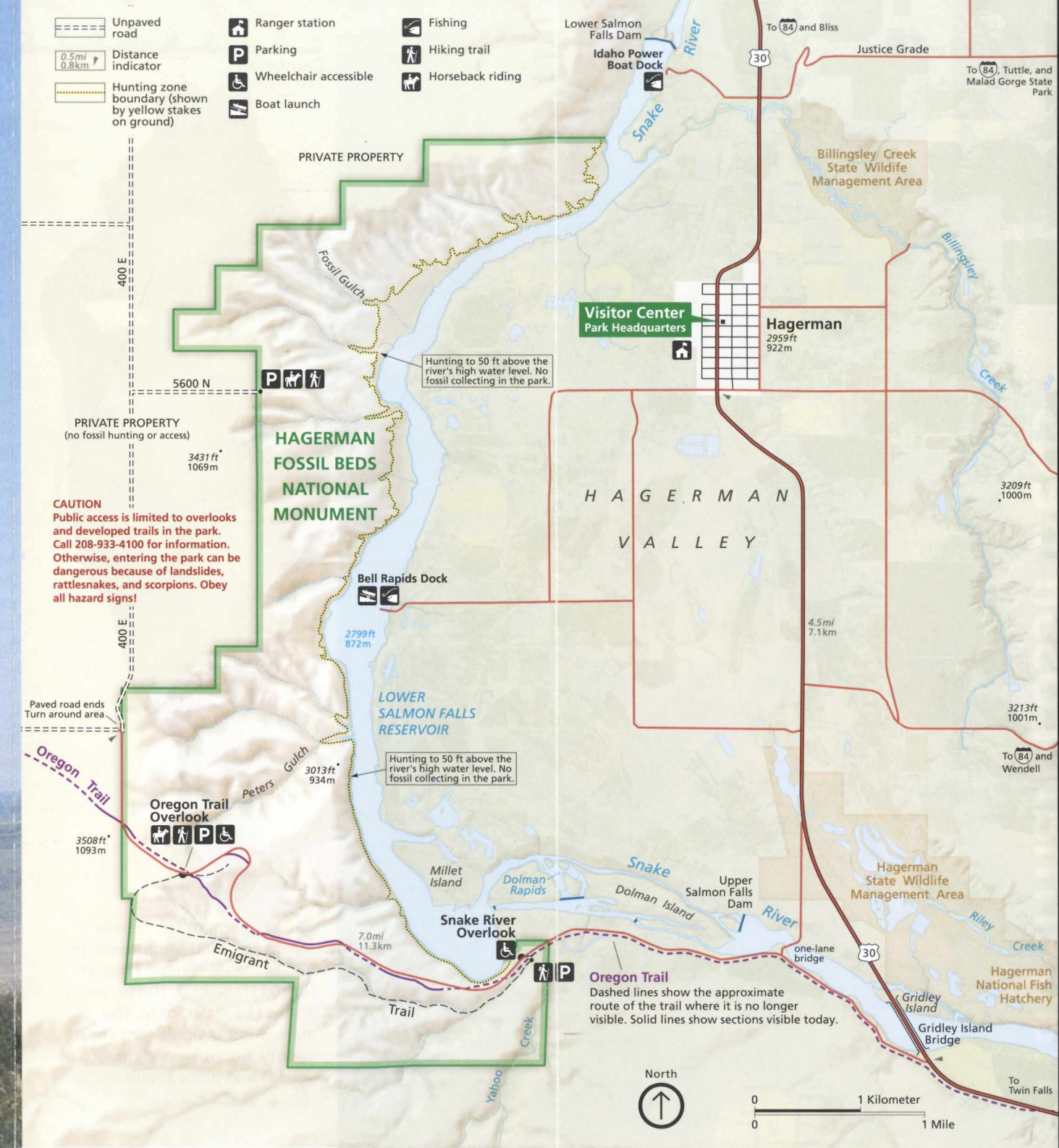
We strive to make our facilities, services, and programs accessible to all. Call or check our website.

More Information

Hagerman Fossil Beds National Monument
PO Box 570
Hagerman, ID 83332
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208-933-4105

Hagerman Fossil Beds is one of over 400 parks in the National Park System. To learn more about parks and National Park Service programs in America's communities, please visit www.nps.gov.

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Reenactors portray emigrants headed west in the 1800s on the Oregon Trail, which passes through the Hagerman area. Here the emigrants were still 700 miles from their goal—Oregon's Willamette Valley.