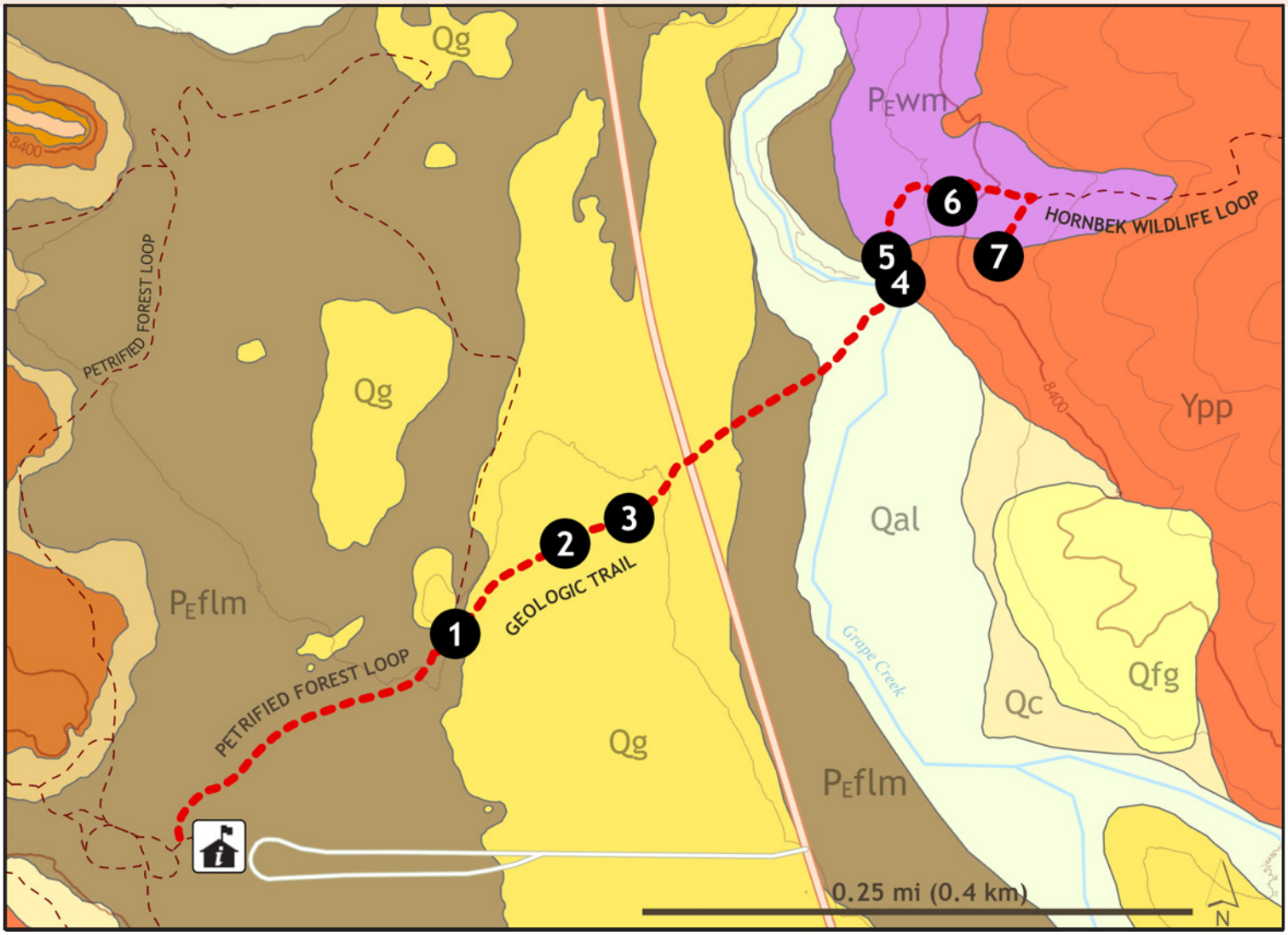
Florissant Fossil Beds
Geologic Trail

National Park Service
U.S. Department of the Interior

Florissant Fossil Beds
National Monument
Colorado

The Florissant valley is a constantly changing landscape, shaped by the power of erosion, uplift, and volcanoes. Geologic activity here began at least one billion years ago when magma cooled to form the Pikes Peak Granite. Volcanoes later impacted the area 37 to 34 million years ago when eruptions covered Florissant in ash. The area continues to change today as Grape Creek cuts through the valley.



Qal	Quaternary alluvium		Florissant Formation: other units
Qc	Quaternary colluvium	P_Eflm	Florissant Formation: lower mudstone
Qfg	Quaternary fan gravels	P_Ewm	Wall Mountain Tuff
Qg	Quaternary gravels	Ypp	Pikes Peak Granite

Contour Interval 40 feet

Getting Started

Exit the visitor center onto the back patio and take the trail immediately on the right. Walk about 0.2 mi (0.32 km) to reach the trail junction at Stop 1, and continue to the right another 0.54 mi (0.87 km) to reach the viewpoint at Stop 7 (front photo). This junction also can be reached by a longer route following the Petrified Forest Loop in the clockwise direction from the visitor center. Follow your progress on the geologic map on the front and the exhibit panels along the trail.

The Geologic Trail crosses Teller County Road 1 between stops 3 and 4. Please use caution and watch for traffic! Also be aware that the trail climbs 80 feet (25 m) from Stop 5 to Stop 7, including a short, steep pitch near the end.

1 Stop One — Eocene Lakebed

Redwood trees grew in a stream valley here 34 million years ago. Volcanic mudflows (lahars) buried the bases of these trees, which were fossilized as minerals filled the cells in the wood. Another volcanic mudflow blocked the stream valley, flooding it to become a lake. The shales that preserve most of the fossils were deposited in this lake and now form the Florissant Formation.

2 Stop Two — Ice Age Gravels

As the geologic trail ascends onto a low ridge, notice that the ground is made up of gravel. The gravel contains minerals that eroded into the valley from the weathered Pikes Peak Granite that forms the surrounding hills. This gravel, called grus, is a few feet deep (a meter or more) and covers much of the Florissant Formation within the Monument (see map on back). Mammoth bones and a tooth have been found nearby in this layer and have been radiocarbon dated as more than 43,000 years (Pleistocene).

3 Stop Three — Crystal Peak

Crystal Peak is the cone shaped mountain to the north. It is weathered from a distinct pluton within the Pikes Peak batholith, known as the Lake George Ring Complex. It formed beneath the surface more than a billion years ago. Crystal Peak is composed of rock having smaller mineral crystals than other parts of the batholith, making the mountain more resistant to erosion and standing in high relief. The area is world famous for its rare minerals, especially the teal-colored feldspar amazonite.

4 Stop Four — Modern and Ancient Streams

The creek beneath the bridge played an important role in the evolution of this valley. Notice that it flows to the north. The stream in this valley flowed south during the Eocene. Evidence for this comes from angular cross-bedding in sandstones preserved in ancient stream channel deposits. Slight tilting of the landscape due to geologic processes caused the stream to change direction. Sediments deposited along the modern stream are called alluvium, which forms from the weathering and erosion of the older rocks surrounding the valley.

5 Stop Five — Pikes Peak Granite

The hillside east of Grape Creek exposes Pikes Peak Granite. This rock formed underground from a large mass of magma known as a batholith, which cooled slowly to form the granite 1.08 billion years ago. It came to the surface with the uplift of the modern Rocky Mountains beginning about 70 million years ago. The Pikes Peak Granite is about 25 miles (40 km) wide and 80 miles (130 km) long. It forms rounded shapes today due to chemical decomposition of the minerals and mechanical freezing and thawing within the cracks.

6 Stop Six — Welded Tuff Outcrop

As the trail climbs it ascends through Wall Mountain Tuff. The Wall Mountain Tuff formed 37 million years ago from a fast-moving pyroclastic ash flow that erupted from a caldera located about 50 miles (80 km) west of here. The superheated ash cloud settled to the ground, welded together, and cooled to form a volcanic rock called welded tuff. A layer of this tuff once covered this area and filled the drainages, but streams have since eroded it leaving only remnants along the sides of the valleys, as you see here. This eruption was the beginning of many subsequent calderas that shaped the geologic history of southwestern Colorado over the following several million years.

7 Stop Seven — Geologic Trail Overlook

As you approach this final stop, watch the rocks on the ground surface and look at the geologic map. You are crossing a contact from the Wall Mountain Tuff back into Pikes Peak Granite at the overlook. Gaze into the modern valley below and imagine how it might have appeared filled with a lake during the Eocene. One of the remarkable things about this modern valley is that it still retains much of the shape it had during the Eocene. Blue Mountain, the ridge visible four miles to the west, was here during the Eocene. There are differences, however. The Guffey volcano that erupted ash into the Florissant lake dominated the southwestern skyline 34 million years ago, but little remains of it today. The pointed summit of Mount Pisgah to the south formed 29 million years ago, after the Eocene lake was gone.

Artist reconstruction of Lake Florissant during the Eocene from Stop 7. In the background, the Guffey Volcanic Center erupts, putting clouds of ash into the air. Compare this with the photo on the front page.

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