

Fossil Falls

From Wikipedia, the free encyclopedia

The **Fossil Falls** is a unique geological feature, located in the Coso Range of California in the United States. Volcanic activity in the mountain range, along with meltwater from glaciers in the nearby Sierra Nevada, played a role in the creation of the falls. They are located near Little Lake, Inyo County, California, 1.0 mi (1.6 km) off US 395 (at a red cinder cone called "Red Hill") on Cinder Road to Red Hill, with signs to Fossil Falls.

Geology

During the last ice age, glaciers formed in the Sierra Nevada. Meltwater from the glaciers pooled into large lakes, including Owens Lake and the Owens River. The river traveled through to Indian Wells Valley, and its course was diverted several times by volcanic activity. The falls were formed when the river was forced to divert its course over a basalt flow, polishing and reshaping the rock into a variety of unique shapes and forms.

All the lava flows at Fossil Falls are basaltic. The Coso Volcanic Field brought flows from the north east and later Red Hill, which can be viewed from Fossil Falls, released the younger lava. The flows occurred between 400,000 years ago and 10,000 years ago. During this period, the glacial flows would run through Fossil Falls and smooth the vesicular basalt. The erosion found at Fossil Falls was formed by the youngest glacial runoff, called the Tioga, from the Sierra Nevada Mountain Range about 20,000 to 10,000 years ago.

In addition to the small gas vesicles in the basalt, there are large, perfectly circular penetrations in the basalt. These are erosional features called potholes. It is speculated that Red Hill cast out granitic detritus which fell into Fossil Falls. Water accelerates as it moves past the rocks. The relatively still water ahead forced the moving water to slow down and rotate to form an eddy. The high velocity currents were enough to catch the granitic rocks from Red Hill and spiral them downwards in multiple vortices, drilling them into the basalt. Sediments would get trapped and continue to circularly erode the holes.

Fossil Falls originally started downstream from where it sits today; it moved upstream as waterfalls typically do. Water falling over the edge of the waterfall undercut the falls and caused them to move upstream and grow taller. This process is called plunge-pool erosion.

Following pages: Photos by Stephen Senturia, January, 2012



Peg at the edge of the start of the upper falls jumble of eroded structures.



Detail of eroded structures in the upper falls watercourse.



Looking over the upper falls to the lip of the lower falls



Small pothole at Fossil Falls. Quarter coin is to set scale.

Coso Volcanic Field

Coso Volcanic Field:¹⁷

The Coso volcanic field is located at the west edge of the Basin and Range province. Initiation of volcanism at Coso preceded the onset of Basin and Range crustal extension there, as expressed by normal faulting. The earlier of the two principal periods of volcanism began with the emplacement of basalt flows over a surface of little relief. Then, during the ensuing period of about 1.5 million years, eruptive activity included chemically more evolved rocks erupted upon a faulted terrain of substantial relief. Following a 1.5-million-year hiatus with few eruptions, a bimodal field of basalt lava flows and rhyolite lava domes and flows developed on Basin and Range terrain of essentially the same form as today's landscape. Many of the young basalt flows are intra-canyon, occupying parts of the present-day drainage system. The Coso volcanic field is best known for its Pleistocene rhyolite. Thirty-eight rhyolite domes and flows form an elongate array atop a north-trending 8 by 20-kilometer horst of Mesozoic bedrock. Nearly uneroded constructional forms are exhibited by most domes. Many are nested within tuff-ring craters, and a few filled and overflowed their craters to feed flows a kilometer or two long.

17) California Geological Survey Website, 2001, 2002



Red Hill, a recent (10,000 years ago) cinder cone.