

## A Visit to The Valles Caldera

This trip will take all day if you plan to enter rather than simply stopping at the pull-offs and scanning with your binoculars for elk, which are easily mistaken for cattle. To enter you will need reservations. These, and additional information, can be obtained by calling 866-382-5537 or going to their website at <http://www.vallescaldera.gov>. The staff at Valles Caldera offers guided (\$15/person) and unguided (\$10) hiking. They also offer biking, fishing clinics, wagon rides, horse rides, night sky adventures, etc.

**Driving Directions:** Getting around in Santa Fe is tricky because the streets represent cattle and wagon trails. To go north from the north side or San Francisco St. (main) entrance to La Fonda, go east on San Francisco toward the Cathedral to the first intersection, turn left. Go to the next intersection, Palace Ave., and turn left again. At Washington St. (one long block) turn right. Continue for several blocks to Paseo de Paralta and turn left. Paseo de Paralta curves around until it meets St. Francis Dr. This is Hwy 84 & 285. Turn right or north and you are on your way.

◆ As you leave the north edge of Santa Fe on Hwys 84 & 285, notice the thousands of white crosses in the National Cemetery on the right.

◆ Hwy 599 or the Santa Fe Bypass is a road constructed around Santa Fe so that shipments of hazardous materials to or from Los Alamos can avoid the city proper. Note, however, that houses are springing up around this route.

◆ To the right you may be able to see the ski runs on Santa Fe Baldy.

◆ You are passing through the Tesuque Pueblo. Bill Watterson, author of the Calvin and Hobbs comic strip, lives here. Because of strong anti-merchandising sentiments, Watterson retired the strip on December 31, 1995.

◆ On the right is the exit to, and on the left may be seen, the Santa Fe Opera building. This has morphed from a theatre completely open to the weather with only the stage covered to, in progressive stages, more and more shielded until now only the sides perpendicular to the main stage are open. This is the only place in the world I can imagine listening and watching a full-blown production of a Mozart opera and being able to see the sparkles of heat lightening going off in the mountains.

◆ Note the Pueblo-related decorations along this newly re-constructed highway. The size of the road gives some indication of the amount of traffic. This is partly a consequence of the gap between what it costs to live in Santa Fe and the amount paid to service workers. The lower paid workers in Santa Fe come in from outside of Santa Fe in disproportionately large numbers for a city of perhaps 175,000 people.

◆ Don't miss Camel Rock on the left (west) side, which is in the Pojoaque Pueblo. This is an erosional remnant resembling a dromedary camel (*Camelus dromedarius*). Erosion has considerably modified the "camel" in the last 50 years so that it may not be recognizable by 2040. It's formed of rocks about 15 million years old, rocks which have yielded vertebrate fossils including those of camels.

◆ At 2:30, the high angular peaks on the skyline are the Truchas Peaks.

◆ The round tower on the right is the Pojoaque Pueblo's cultural center. The Pueblo teaches many of the crafts that otherwise might be lost, and some newer crafts, like jewelry making, all in pursuit of helping the tribal members better support themselves.

◆ Take Route 285 north to the junction with highway 502. This junction is a bit counter-intuitive because you need to stay in the right-hand lane, go under the overpass to head west or left toward Los Alamos. At the interchange with Hwy 4, go towards White Rock (south) on Hwy 4. This is a winding, twisting road and goes past Bandelier National Monument. Stay on Hwy 4 about 22 miles until you see the signs and the pull-offs for the Valles Grande. If you're going to enter, follow the directions given when you called ahead.

### A Brief History of The Valles Caldera

The Baca Ranch, some 140 square miles nestled into the most studied caldera in the United States (and probably the world), is now The Valles Caldera Trust that was created by the Valles Caldera Preservation Act of 2000 to preserve and protect this historic ranch. Authorizing legislation was signed into law by President Clinton on July 25, 2000. This was the

third attempt to transfer this land from private to federal ownership. Political tensions about the management of this Trust persist.

The caldera within which this Trust lies was formed about 1.25 Ma when a large erupting volcano collapsed. It collapsed because its magma chamber had been emptied of the material to form the upper Bandelier Tuff that coated the landscape like so much frosting, formed the cliffs that you'll see as you drive up to Los Alamos, and the cliffs into which dwellings were dug, which you may see if you go to Bandelier National Monument. The collapse left a giant depression. Today it is known as the Valles Caldera, a beautiful scenic basin of grassland and forest that is home to one of the West's largest elk populations, as well as to archaeological treasures and camera-ready vistas.

However, according to Peter Fawcett and John Geissman from the University of New Mexico's Department of Earth & Planetary Sciences, for most of its history, the Valles Caldera was neither volcano nor grassland, but an extraordinary lake, extraordinary because, as opposed to almost all other lakes, it may have existed for hundreds of thousands of years until its waters breached the rim to form what is now the Jemez River. Therein lies its appeal to researchers interested in the Earth's climate history in much the same way that ice cores yield information about past climate. Therefore they and their students are interested in what happened in the 1.25 million years between those two geological moments—explosive volcanism and tranquil grasslands. As Geissman says, "We don't have the opportunity to look at materials of this age very often." The materials to which Geissman refers are core samples of lake sediments retrieved in May 2004. A team drilled 80 meters (approximately 260 feet) into the former lake bed. Sedimentological, paleomagnetic, paleontologic, isotopic, and palynologic (study of pollen and seeds) characteristics of the core will allow Fawcett, Geissman, and a number of other scientists to reconstruct a history of climate for the years represented by this 80 meters of core.

(This section borrowed heavily from *Robert Julian* <http://research.unm.edu/quantum/vallescaldera.html>)

## Returning

To return to Santa Fe you have two choices. The simplest is to just return the way you came. Assuming you haven't gone into the Caldera, and you have additional time, you might continue on Hwy 4, which will wind its way about 45 miles down the south side of the Jemez Mountains. At about the southwest 'corner' of the caldera you'll meet the junction with Hwy 126. Stay on Hwy 4. You're now headed directly south. The first point of interest, if you'd like to hike, will be **Battleship Rock** where hiking trails begin from Battleship Rock campsite.

Shortly after Battleship Rock, you encounter **Jemez State Monument Heritage Area**. Here you'll find the stone ruins of a 500 year old Indian village and San José de los Jemez church. The village of Giusewa was built where narrow San Diego Canyon meets the tributary Church Canyon by the ancestors of the present-day people of Jemez (Walatowa) Pueblo. The name Giusewa refers to the natural springs in the area. In the 17th century, the Spanish established a Catholic mission at the village. The mission was short-lived; and, in time, the people abandoned the site and moved to the current location of Jemez Pueblo. The massive stone walls, in which you may note are boulders carried down the Jemez River in flash floods, were constructed about the same time the Pilgrims landed at Plymouth Rock. The heritage center contains exhibitions that tell the story of the site through the words of the Jemez people. A 1,400-foot interpretive trail winds through the impressive site ruins.

Another short distance will bring you to a pull off on the left or east side of the Hwy. From here you can see the **Soda Dam**. Besides forming bizarre features such as Soda Dam, the chemical precipitate, called travertine if it is  $\text{CaCO}_3$ , carries clues about deep Earth processes. Springs that dissolve the material that later is precipitated are often located along fault zones that reach deep into the crust. Besides commonly carrying dissolved  $\text{CaCO}_3$  and  $\text{CO}_2$ , they may carry  $^3\text{He}$ , a gas derived from the Earth's mantle.  $\text{CO}_2$  is much in the news as a greenhouse gas, but here it's behaving more like the gas escaping from a carbonated beverage. The colder the beverage, the more  $\text{CO}_2$ , it can hold in solution. When the beverage, or the spring waters, warms, it loses its ability to hold the  $\text{CO}_2$  in solution. And pressure has the same effect; the more pressure, the more  $\text{CO}_2$  the beverage can hold, as your aware from having taken the cap off of a bottle of carbonated beverage. Because the primary spring here is a hot or warm spring, it's the pressure difference that's probably most effective in explaining the precipitation of the travertine. When the spring water loses  $\text{CO}_2$ , it also loses its ability to hold  $\text{CaCO}_3$  in solution. That's when the travertine forms. Small caves have been constructed by the springs. Rock shelters can be found in the immediate vicinity of Soda Dam. An extensive archaeological deposit was found in one of the caves during the 1930s, indicating that the area around Soda Dam has been used for more than 2,000 years by a variety of cultures. A variety of hot-spring sources exist in the area of Soda Dam, including several small seeps. Portions of the original natural dam were blown up for the construction of the highway.

Next on your trip you'll enter the village of **Jemez Springs**, named for its famous mineral hot springs. On the north edge of the village is a monastery. There's also a bath house if you'd like a hot soak. This is another indication of the Earth's heat being very close to the surface in the Jemez Mountains, which are a huge pile of volcanic rocks. Or perhaps you're ready for a bit of sustenance, which might result in a visit to the The Sleeping Lizard Café.

South of Jemez Springs you'll enter the **Jemez Pueblo** (pronounced "Hay-mess" or traditionally as "He-mish"), which is one of the 19 pueblos located in New Mexico. It is a federally recognized American Indian tribe with 3,400 tribal members, most of whom reside in a puebloan village that is known as "Walatowa" (a Towa word meaning "this is the place"). Jemez is the only culture that speaks Towa, and our traditional law forbids our language from being translated into writing in order to prevent exploitation by outside cultures. Like the other 18 Pueblos, the Pueblo of Jemez is an independent sovereign nation with an independent government and tribal court system, which includes the spiritual and society leaders.

The ancestors of the Jemez, having originated from a place called "Hua-na-tota," migrated to the "Canon de San Diego Region" from the four-corners area in the late 13th century. By the time of European contact in the year 1541, the Jemez Nation was one of the largest and most powerful of the puebloan cultures, occupying numerous puebloan villages that were strategically located on the high mountain mesas and the canyons that surround the present pueblo of Walatowa. When the Coronado Expedition entered into the area in 1541, exactly 40 peaceful years went by before contact between the two groups was experienced again. The Rodriguez-Chamuscado Expedition entered the area in 1581, followed by the Espejo Expedition in 1583. In the year 1598, a detachment of the first colonized expedition under the direction of Don Juan de Onate visited the Jemez. A Franciscan priest by the title of Alonzo de Lugo was assigned to our people and he had our people build the area's first church at the Jemez Pueblo of Guisewa (now Jemez State Monument). According to early written Spanish records (Espejo Expedition 1583), the Jemez nation contained an estimated 30,000 tribal members around the time of the Spanish contact, indicating that the population of the Canon de San Diego was probably three times larger than what it is today. Unfortunately, the peace between our differing cultures did not last long and the Jemez population soon became decimated as a result of warfare and diseases introduced by the Europeans.

During the next 80 years, numerous revolts and uprisings occurred between the Jemez people and Spanish, primarily due to Spanish attempts to Christianize our people by force, and congregate them into just one or two villages, where the Franciscan missions were located. As a result, numerous people were killed on both sides, including many of the Franciscan priests. By the year 1680, the hostilities resulted in the Great Pueblo Revolt, during which the Spanish were expelled from the New Mexico Province through the strategic and collaborative efforts of all the Puebloan Nations. By 1688, the Spanish had begun their reconquest in force under General Pedro Reneros de Posada, acting Governor of New Mexico. The Pueblos of Santa Ana and Zia were conquered, and by 1692, Santa Fe was again in Spanish hands under Governor Diego de Vargas. Four more years would pass before the Jemez Nation was completely subdued and placed under clergy and military rule. The Jemez people were moved and concentrated into the single Village of Walatowa where they presently reside.

In 1838, Jemez culture became diversified when the Towa speaking people from the Pueblo of Pecos (located east of Santa Fe) resettled at the Pueblo of Jemez in order to escape the increasing depredations of the Spanish and Comanche cultures. Readily welcomed by our ancestors, the Pecos culture was rapidly integrated into Jemez Society, and in 1936, both cultural groups were legally merged into one by an Act of Congress. Today, the Pecos culture still survives at Jemez. Its traditions have been preserved, and as previously noted, the Pueblo of Jemez still honorably recognizes a Governor of Pecos.

The Jemez people are known for arts and crafts. Traditional dances are still held throughout the year at Jemez, many of which are not open to the public. The public is welcome to certain events, particularly the "Nuestra Senora de Los Angeles Feast Day de Los Persingula", August 2nd (Pecos Feast of St. Persingula), the "San Diego Feast Day" on December 12th.

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From the Jemez Pueblo drive to San Ysidro where you will meet Hwy 550. Turn left onto Hwy 550 towards Albuquerque and Bernalillo. In Bernalillo, Hwy 550 meets I-25. Take I-25 north to Santa Fe. Take exit 284, the Old Pecos Trail. Stay on Old Pecos Trail. It will morph into the Old Santa Fe Trail and dead end into the backside of the La Fonda at Water St. The intermediate route back is to return along Hwy 4 until it meets Hwy 501 that enters Los Alamos, where it changes to Hwy 502. Then stay on Hwy 502 until you come to the turn off to Hwys 84 & 285 back to Santa Fe.