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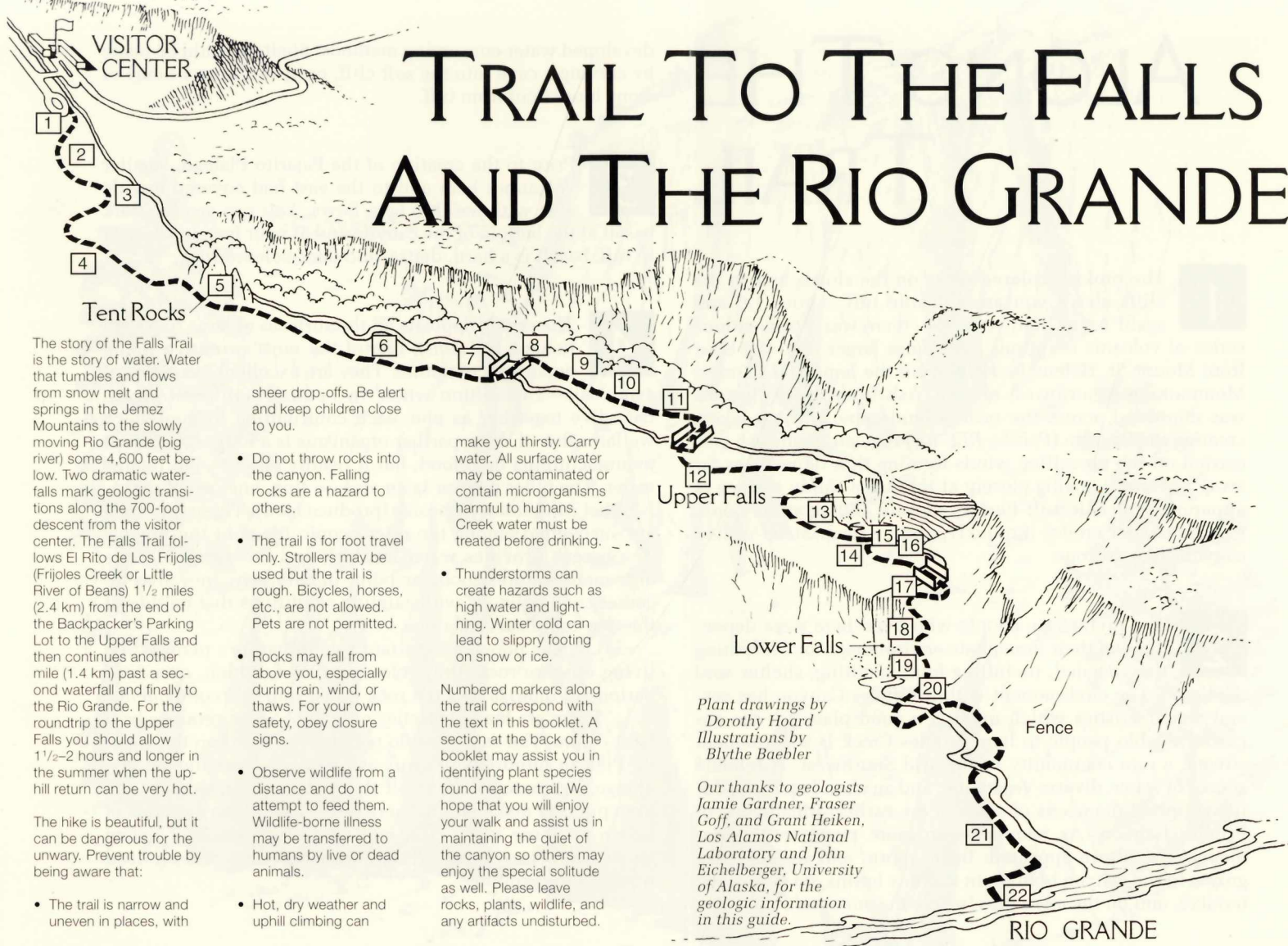
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A GUIDE TO THE FALLS TRAIL BANDELLER NATIONAL MONUMENT

TRAIL TO THE FALLS AND THE RIO GRANDE



The story of the Falls Trail is the story of water. Water that tumbles and flows from snow melt and springs in the Jemez Mountains to the slowly moving Rio Grande (big river) some 4,600 feet below. Two dramatic waterfalls mark geologic transitions along the 700-foot descent from the visitor center. The Falls Trail follows El Rito de Los Frijoles (Frijoles Creek or Little River of Beans) 1½ miles (2.4 km) from the end of the Backpacker's Parking Lot to the Upper Falls and then continues another mile (1.4 km) past a second waterfall and finally to the Rio Grande. For the roundtrip to the Upper Falls you should allow 1½–2 hours and longer in the summer when the uphill return can be very hot.

The hike is beautiful, but it can be dangerous for the unwary. Prevent trouble by being aware that:

- The trail is narrow and uneven in places, with
- Hot, dry weather and uphill climbing can

sheer drop-offs. Be alert and keep children close to you.

- Do not throw rocks into the canyon. Falling rocks are a hazard to others.
- The trail is for foot travel only. Strollers may be used but the trail is rough. Bicycles, horses, etc., are not allowed. Pets are not permitted.
- Rocks may fall from above you, especially during rain, wind, or thaws. For your own safety, obey closure signs.
- Observe wildlife from a distance and do not attempt to feed them. Wildlife-borne illness may be transferred to humans by live or dead animals.

make you thirsty. Carry water. All surface water may be contaminated or contain microorganisms harmful to humans. Creek water must be treated before drinking.

- Thunderstorms can create hazards such as high water and lightning. Winter cold can lead to slippery footing on snow or ice.

Numbered markers along the trail correspond with the text in this booklet. A section at the back of the booklet may assist you in identifying plant species found near the trail. We hope that you will enjoy your walk and assist us in maintaining the quiet of the canyon so others may enjoy the special solitude as well. Please leave rocks, plants, wildlife, and any artifacts undisturbed.

Plant drawings by
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Illustrations by
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RIO GRANDE

ALONG THE TRAIL

1

The pinkish colored rocks on the slopes and in the cliffs above you are volcanic tuff. About 1.6 and again 1.2 million years ago, there was a tremendous series of volcanic eruptions (600 times larger than the blast from Mount St. Helens in 1980) from the Jemez (*HAY-mez*) Mountains just northwest of here. Ash from the explosions was deposited across the nearby landscape in thick layers creating the Pajarito (*Pah-ha-REE-toe*) Plateau. Some ash was carried on the prevailing winds forming thin deposits as far away as Iowa. Looking closely at the tuff a sandy texture is apparent. Volcanic tuff here is porous and relatively soft. Running water erodes it quickly, cutting deep, steep-walled canyons like this one.

2

The prehistoric people who lived here were dependent on their immediate environment for everything they needed, including food, clothing, shelter, and medicine. The environment within Frijoles Canyon has several characteristics which made it a good place for the ancestral Pueblo people to live. Frijoles Creek is a permanent stream, a rare commodity in the arid Southwest. A reliable source of water, diverse vegetation, and an abundance of wildlife supplied the needs of some of the earliest inhabitants of Frijoles Canyon. As people began more permanent settlements, agriculture appeared. Beans, corn, and squash were grown in the canyon bottom, in shallow basins, on side-slope terraces, and on the mesa tops, where the ancestral Pueblos

developed water-conserving methods. Shelters could be made by carving a cave into the soft cliff, or by building a home of stone blocks cut from tuff.

3

Prior to the creation of the Pajarito Plateau, smaller volcanoes here and to the east had covered a wide area with basaltic lava flows. You can see the dark basalt at the bottom of the canyon and at your feet. In contrast to tuff, basalt is a hard, dense, and dark-colored rock.

4

The crusty deposits on the surfaces of large rocks are lichens (*LY-kens*), one of the most primitive living organisms in nature. They are excellent examples of symbiosis—a condition where two entirely different organisms live together as one, each contributing to the other's welfare. One of these partner organisms is a fungus. It cannot manufacture its own food, but it readily absorbs and retains water. The other partner is an alga—a tiny, one-celled organism that can photosynthesize (produce food). These tiny cells are suspended among the microscopic fibers of the fungus. The fungus provides water for itself and the alga while the alga manufactures food for both. In this way, they live together cooperatively, withstanding conditions that neither of the two could survive alone.

Lichens play an important role in nature's plan. While living on bare rock, they release an acid, which, over long periods of time, breaks the rock down into soil components.

There are many varieties of lichen. Some produce brilliant colors. The early Pueblo people who lived on the Pajarito Plateau hundreds of years ago would scrape the yellow-orange pigmented lichens off the rocks and mix them with pine pitch to make paint. There are at least three varieties of lichen on these rocks. You may find other kinds of lichen growing on trees, especially on dead branches, and on dead wood on the ground.



5

These eroded remnants of tuff are called tent rocks. There are many different kinds of tent rocks in the Jemez Mountains. Tent rocks form when some harder material or coating protects portions of the rock from erosion. There are many different ways that tent rocks can develop in tuff. Escaping vapor may heat the rocks causing some particles to weld together more firmly, or the gasses might contain minerals that, when precipitated, form cement between the particles. The deposition of minerals by groundwater may also form a resistant covering protecting the “tents” from erosion. The most obvious method occurs when a cap of harder stone slows the erosion of the soft rock beneath.

6

If you stop and listen for a moment you will hear the babble and murmur of Frijoles Creek. Frijoles Creek flows all year. This availability of water allows plants such as the box elder and canyon grape to have larger water-losing leaves than plants growing on the surrounding mesas. The first human inhabitants were attracted to Frijoles Canyon by the wealth of resources created by the permanent stream.

Today Frijoles Creek continues the long, slow process of cutting through the geologic layers. Periodically flash floods turn the usually quiet creek into a muddy, raging torrent carrying large rocks and trees. In 1977, a large wildfire (in the Middle Frijoles watershed) removed the soil-retaining plant cover from more than 9,000 acres of land within the monument. Several flash floods resulted including one that flooded the visitor center parking lot and moved tables at the picnic grounds.

7

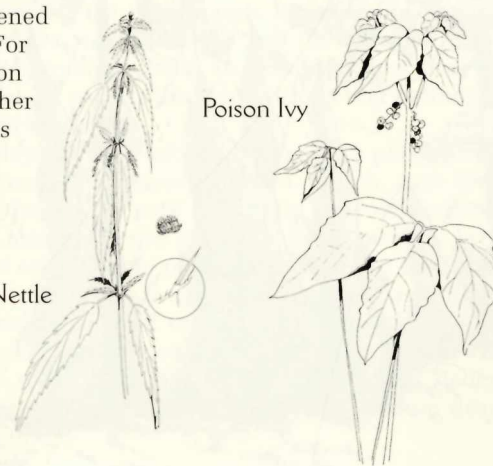
The cliff of white rock to your right is an outcrop of Upper Bandelier Tuff (approximately 1.2 million years old), the same rock mentioned at stop 1. If you look carefully at this rock, you will see rounded fragments of

pumice and darker pieces of older rock. The older fragments were picked up by the tuff as it traveled across the landscape.

8

Here along the creek it may be hard to remember that you are in a high desert in New Mexico. During the summer, the leaves, shrubs, and vines form a thick, shady canopy. If the air is warm there will be many rich fragrances in the air. Some moisture-loving plants that flourish in the canyon include narrowleaf cottonwood, box elder, and canyon grape.

Unfortunately for hikers, the lush streamside environment is also ideal for two plants you’ll want to avoid: poison ivy and stinging nettle. The oils of poison ivy can cause a long-lasting itchy rash. Scratching can spread the irritating oil to other parts of the body, so skin areas that may have brushed against the leaves should be washed. Stinging nettle leaves have sharp hairs that inject tiny amounts of formic acid into the skin. This produces a stinging sensation. Luckily the effects of formic acid are short-lived and can be lessened by cold water. For more information on these and other Bandelier plants see the section beginning on page 10 of this booklet.



9 Here you have a chance to take a close look at basalt rock. Basalt was a valuable source of tools for Indians living in the canyon. Manos (*MAH-nose*) and metates (*muh-TAH-tays*) for grinding corn, picks for carving out caves, and axes, hammers, and other tools that had to stand up to heavy use were often made from basalt.

Tuff forms from volatile volcanic eruptions that spew ash and cinder into the air. Solid particles can actually flow like liquids during these massive explosions. Basalt forms during quieter eruptions flowing from fractures or vents in the earth's surface as molten lava and cooling relatively quickly.

10 Just as plants flourish using the rich resources of the canyon, so do a wide variety of animals. Abert squirrels, with their tufted ears and white underbellies are a common sight. Mule deer are sometimes seen grazing in the quiet by the creek. The cry of a circling hawk or the mimicry of a Stellar's jay may be detected by those who listen closely. Although the canyon is rich in wildlife including bear, mountain lion, elk, and coyote, visitors will rarely see these wary inhabitants.

Signs of their presence are more easily found. You may see scat (animal droppings) left on rocks to mark an animal's territory or tracks crossing or following the trail. In winter, if you are lucky enough to hike just after a snow, even the tracks of small mammals such as mice can be clearly seen.

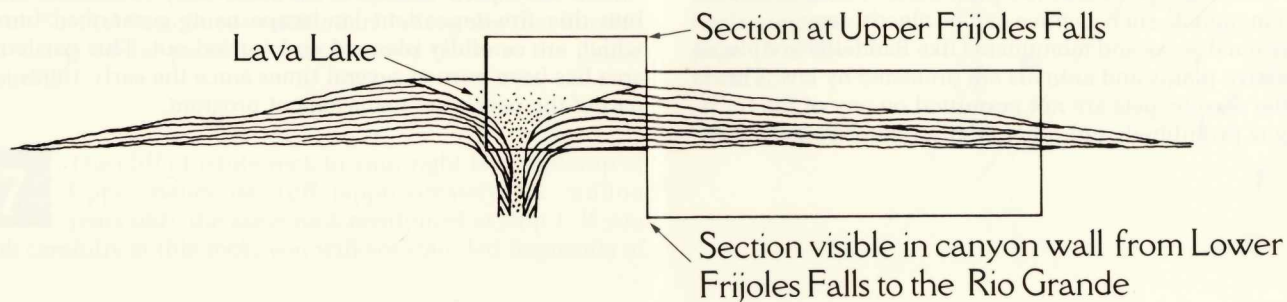
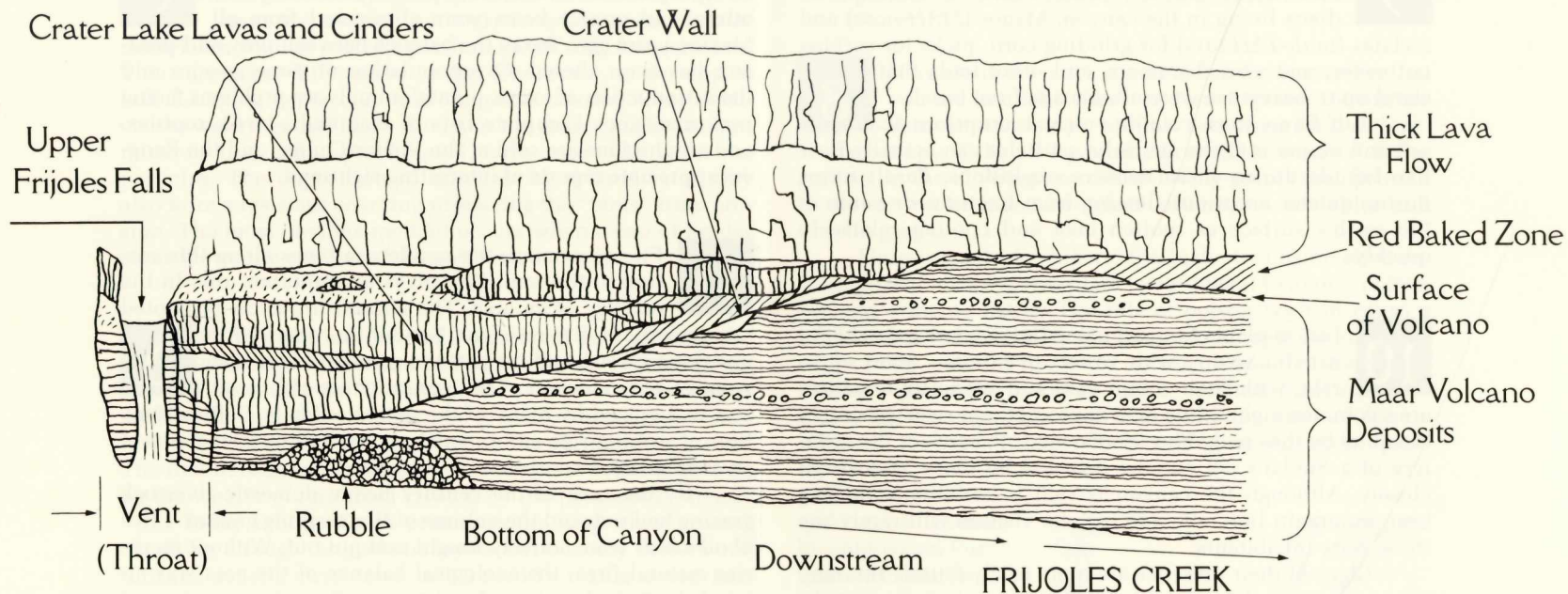
National parks and monuments like Bandelier are places where native plants and animals are protected by law. This is one of the reasons pets are not permitted on any of the trails. Hunting is prohibited, and other regulations are often neces-

sary. Even with Park Service protection, the ecosystem here is not complete. Several native species, including wolves, river otters, and grizzly bears were eliminated from all of New Mexico years ago. Today the balance between prey and predator has been altered. Overpopulation of some species and the introduction of exotic plants/animals are problems facing park managers. Complete lists of mammals, birds, reptiles, and amphibians are sold at the Visitor Center, and the Rangers appreciate reports of interesting sightings.

11 Fire scars mark the ponderosa pines along this section of the trail. Fire plays an important role in the ecology of an area. The natural fire cycle promoted the growth of fire-resistant ponderosa pines, thinned the understory trees, and maintained grass and herbaceous (non-woody) groundcovers. This groundcover stabilized the soil and was grazed by many of the native animals. Before 1880, fires of varying size and intensity burned through the area at an average interval of about 8–12 years.

By the turn of the century heavy domestic livestock grazing had reduced the volume of fire-carrying grasses. Fires of all kinds were actively fought and put out. Without recurring natural fires, the ecological balance of the area was altered. Increased soil erosion is one serious consequence of the resulting vegetation changes.

Today park managers systematically reintroduce fire into this fire-dependent landscape using prescribed burns, which are carefully planned and carried out. This particular area has been burned several times since the early 1980s as a part of the park's fire management program.



12 The trail beyond this point becomes narrower with steep drop-offs. Keep children close. During winter, this next section is frequently very icy. Watch your step.

13 As you turn the corner ahead, notice the difference in plants, air temperature, wind direction, and even the smell of the air. You can tell that the environment is drier, for the plants are ones that tolerate hot, arid surroundings. The 700-foot change in elevation between the visitor center and the canyon bottom means that spring arrives at the visitor center about two weeks after it arrives here. In the fall, leaves change color here about two weeks later than at the higher elevations.

14 Here and across the canyon you can see layers of what looks like sandstone, but it is actually volcanic rock. You are standing in the mouth of an ancient maar volcano. A maar volcano is one that ejects lava through water such as a stream, lake, or underground aquifer. Molten rock erupting through or into water caused steam explosions. Rapid cooling occurred as bits of lava and fragments of pre-existing rock strata were spit into the air and deposited as thin layers. Some larger pieces of once molten rock, aerodynamically shaped by their plummet, are called volcanic bombs. This volcano was low and wide: about 2 miles across and approximately 100 feet high. You can see more maar deposits farther down the canyon. (See graphic on opposite page.)

*** Please be very careful not to kick or throw anything into the canyon. Someone might be below.***

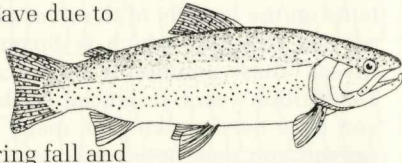
15 Ahead you can see where the creek joins the Rio Grande, which is partway along its journey from Colorado through New Mexico tracing the Texas—Mexico border, to the Gulf of Mexico. The river flows through basins formed by spreading of the earth's crust along the Rio Grande Rift, a feature at least 30 million years old. The mountains on the far side of the river are the Cerros del Rio (*SER-ose del REE-oh*), which is Spanish for "Mountains of the River." These mountains are volcanoes which, over the last 1–3 million years, produced the basalt rocks through which you have been walking. In many places on the sides of the canyon you may notice evidence of the passage of time between eruptions. Here and there a layer of very red dirt appears. This is soil that formed through time and erosional processes on the surface of one flow, and then was covered by the next one. The heat of the new lava flow baked the soil, producing the red color.

16 After the volcano's cone built up above the level of the water, or after the aquifer dried up, the maar eruptions changed to more typical lava flows and cinders from intermittent lava fountains. Eventually activity ceased, and lava still in the throat of the volcano slowly hardened in place. Upper Falls drops approximately 80 feet over this very resistant rock from the throat of the volcano.

17

If you look closely into the quiet pools of water along Frijoles Creek you may see a flash of color as a small fish darts for cover. Non-native fish (brook, rainbow, and brown trout) were introduced into the stream early in the twentieth century and their descendants still live there. Fishing is not permitted in Frijoles Creek below Ceremonial Cave due to DDT contamination.

Migratory waterfowl make random stops at the creek and at the river below, especially during fall and spring migrations. Sandhill cranes pass overhead frequently during their migratory journeys. It is often easier to discern their distinctive calls than to spot them flying far overhead.



18

The talus slope to your right is formed primarily of debris from lava flows and maar deposits. As the basalt lava solidifies cooling cracks develop. These fractures are known as columnar joints. The cracks form block-sized hunks of basalt that eventually tumble down-slope forming the talus. This particular rockfall, as documented by historic photographs, happened in 1942.

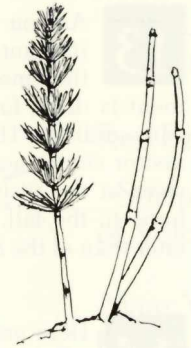
19

Turning around and looking to your left, you will see the second or Lower Falls. The Lower Falls, like the Upper Falls, drops over a resistant ledge formed of basalt rock. The drop here is less than 45 feet. In winter, a beautiful ice sculpture may form at the base of this falls.

20

Beyond this point numerous social trails have been created by visitors straying from the main trail. The maze of trails can be confusing to visitors and has a negative impact on park resources. The National Park Service is making efforts to delineate the preferred trail. Please stay on it.

The main trail crosses Frijoles Creek three more times on its way to the Rio Grande. Bridges are not provided beyond this point. Use caution. In winter, all walking surfaces, especially partially submerged rocks, may be icy. A very unique plant can be found growing along the creek in this area. Horsetails (*Equisetum* sp.) flourish in the water-rich regions of Frijoles Canyon. Horsetails grow in two forms: one with bundles of slender green upright branches and the other with green segmented reedy stems. Only the latter form can reproduce. Horsetails are the only surviving members of a once-large plant family. Because all known relatives are now extinct, horsetails are called living fossils.



21

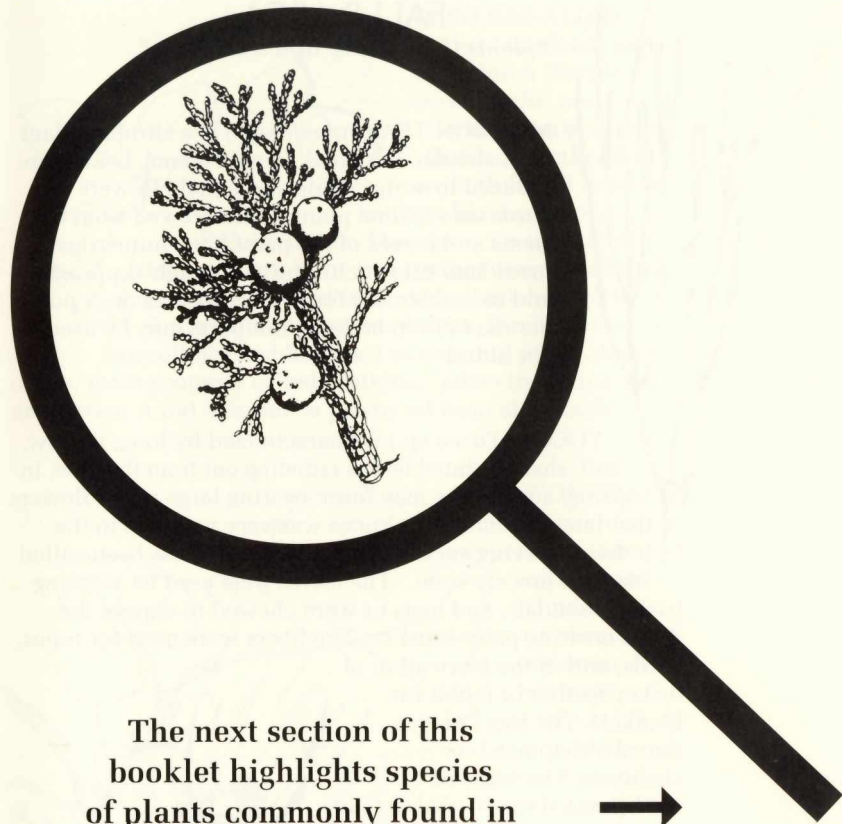
In the mid-1970s Cochiti Dam was constructed along the Rio Grande downstream from Bandelier National Monument. The dam was built to provide flood control for a portion of the Rio Grande valley and to enhance wildlife and recreation opportunities in the area. The winter and spring of 1985 brought very heavy snowpack to the watershed of the Rio Grande. During spring runoff, the flood-pool of Cochiti Dam was allowed to back up much higher than its usual level. Over 200 acres of Bandelier along the river were under lake waters for a year and a half. Trees and other plants drowned as a result of the long inundation. The high lake level could be repeated in any year with heavy runoff.

22

The receding waters left behind a thick layer of silt and the seeds of numerous non-native plants brought from upstream agricultural/weedy pasture areas. Rich soils high in nutrients, fine-textured soils that drained poorly, and initial ample soil moisture supported rapid colonization and growth of non-native species (weeds). Native species, previously killed by the inundation, were not able to compete with the weeds in colonizing the disturbed habitat. Nearly 100 percent of the plants growing on the flats near the Rio Grande are non-native species.

One of the invaders is kochia, a plant that can grow to six feet tall. It has coarsely toothed leaves. Contact with this plant has been known to cause a rash in some people.

Due to the risk and increased maintenance costs of high water, the trail along the Rio Grande has had to be abandoned and may or may not be passable at any given time.



**The next section of this
booklet highlights species
of plants commonly found in
various trailside environments.**

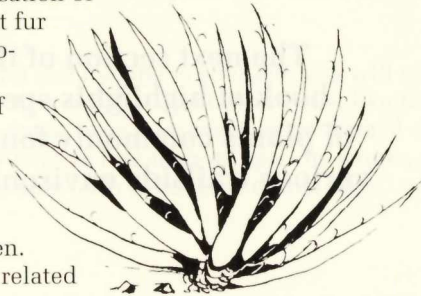


FALLS AREA

plants that tolerate arid conditions

MORMON TEA (*Ephedra* sp.) is a shrubby plant with slender, bunched, jointed stems. Leaves are reduced to scales. Male and female flowers are borne on separate plants. Teas brewed from the stems and leaves of the plant have numerous medicinal uses including as a cough suppressant and as a treatment for urinary disorders. A powder made from boiled plant parts may be used to tan hides.

YUCCA (*Yucca* sp.) is characterized by long, narrow, stiff, sharp-pointed leaves radiating out from the base. In spring, a tall spike may form, bearing large white flowers that later become fruit. Yucca was very valuable to the Indians, serving such a variety of needs it has been called "nature's grocery store." The leaves were used for weaving baskets, sandals, and mats or were chewed to expose the fibers creating paint brushes. The fibers were used for ropes, cords, and in the fabrication of turkey feather or rabbit fur blankets. The roots produced a soap used for shampoo. The fruits of the banana (broad-leaved) and the flowers of both the broad and narrow-leaved yucca were eaten. Yucca is more closely related to lilies than cacti.



SAGEBRUSH (*Artemisia* sp.) is a shrubby plant, one to twelve feet high with silvery-gray leaves and dark purplish shaggy bark. You may notice the spicy fragrance following a rain. Sage and sagebrush are in different families. Big sagebrush and little sagebrush are both found along this trail. Little sagebrush is smaller, lacier, and smells sweeter. Sagebrush is most commonly used for medicinal purposes, especially for ailments of the stomach.

WALKINGSTICK CHOLLA (*Opuntia imbricata*) is a tall, skinny cactus with narrow branches. Bright pink flowers bloom in late spring and are replaced by yellow green fruits often mistaken as flowers when the cactus is not in bloom. During prehistoric times many parts of the plant may have been used as a famine food.

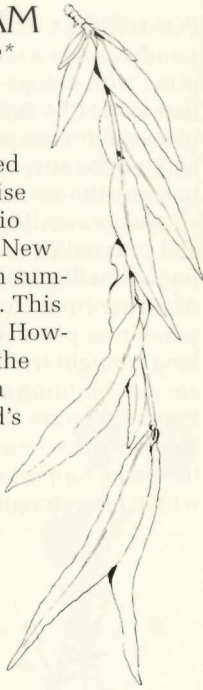
Today, usually only the flower buds are eaten. The internal woody skeleton of the plant, exposed as the fleshy outside deteriorates, is often visible in dead plants lying at the base of live plants.



ALONG THE STREAM

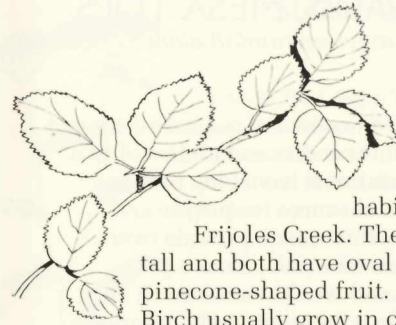
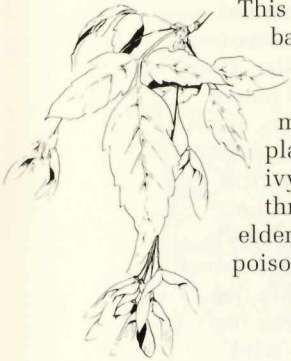
plants that require moisture

NARROWLEAF COTTONWOOD (*Populus angustifolia*) is a tall tree with gray furrowed bark. The narrow, willow-like leaves surprise many people, being so different from the Rio Grande cottonwood common elsewhere in New Mexico. Cotton-like filaments, appearing in summer, catch the wind and transport the seed. This "cotton" can't be used for making clothing. However, the wood of the cottonwood trunk is the favored wood for making drums. The drum maker's work is assisted by the cottonwood's tendency to rot in the center once the tree dies.



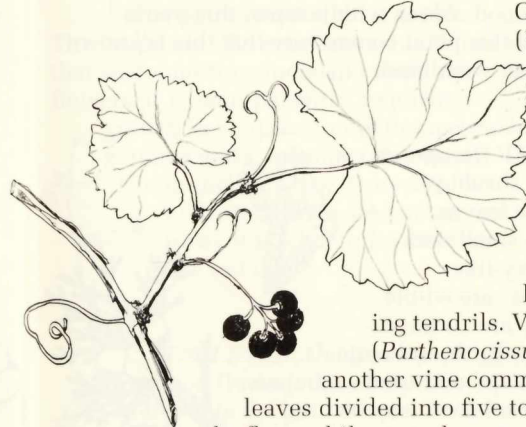
BOX ELDER (*Acer negunda*)

This tree with grayish-brown bark, leaflets of three, and winged seeds is not an elder, but a member of the maple family. Young plants can easily be mistaken for poison ivy, because both have leaves grouped in threes. The two can be told apart since box elders have opposing leaves while those on poison ivy are alternating.



THINLEAF ALDER (*Alnus tenuifolia*) and water birch (*Betula occidentalis*) are slender-trunked trees that look similar and are both found in moist habitats like here along

Frijoles Creek. They grow up to 30 feet tall and both have oval toothed leaves and tiny pinecone-shaped fruit. Alder bark has warts. Birch usually grow in clumps. Birch "cones" are solitary and fall apart in autumn, while alder cones, more properly called "catkins," come in groups and are harder. A red dye can be produced from alder bark.



CANYON GRAPE (*Vitis arizonica*) is

a vine that can be seen climbing on shrubs and trees. It has large (1 1/2"–3 1/2") maple-like leaves and coil-

ing tendrils. Virginia Creeper (*Parthenocissus inserta*),

another vine common here, has leaves divided into five to seven leaflets, while grape leaves are undivided.

The grapes are edible, but very easily confused with those of the creeper, which are not. The leaves of creepers are often the first to change in fall, turning a deep purplish red. The fruit of canyon grapes may be used similarly to cultivated grapes.

CANYON WALLS, MESA TOPS

plants that survive on rainfall alone

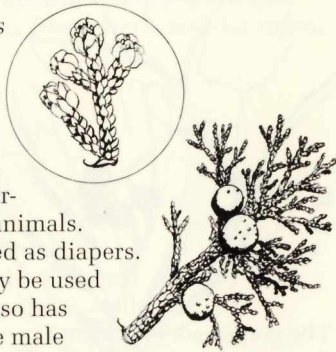


PIÑON PINE (*Pinus edulis*) is a round-topped tree with short needles in bundles of two.

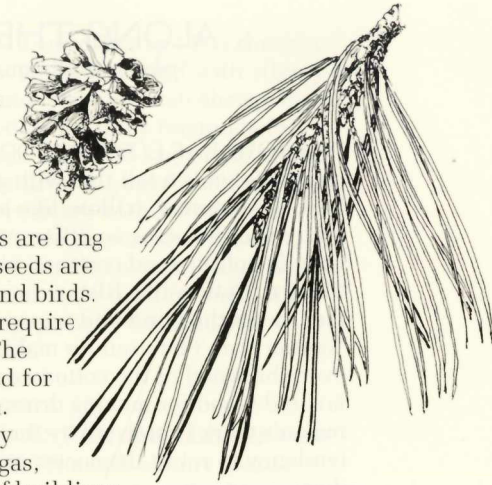
The flavorful nuts have long been a favorite food source for people and animals. Piñon nuts provide over 3,000 protein-rich calories per pound and would have been a very valuable wild plant food. Unfortunately seeds are produced in abundance only every 6-7 years. Piñon tree pitch was sometimes chewed as a gum and piñon wood makes excellent, wonderfully scented firewood. Along with juniper, this tree is

so characteristic of this plant community that this is known as the piñon-juniper woodland.

ONE-SEED JUNIPER (*Juniperus monosperma*) is a shrubby tree with scale-like leaves, shreddy bark, and small dark blue or purple berry-like cones. The “berries” are edible but not tasty. They are an important winter food for birds and animals. The bark was pounded and used as diapers. A tea made from the leaves may be used during childbirth. The wood also has numerous uses. One trait of the male juniper is production of large amounts of pollen. Unfortunately many people develop allergic reactions in response to this requirement of juniper reproduction.



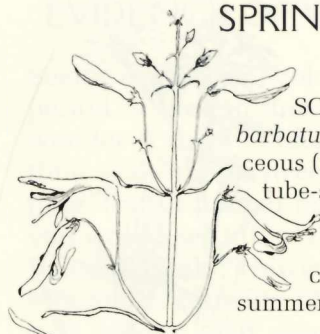
PONDEROSA PINE (*Pinus ponderosa*) is a tall, straight pine, with orange-brown bark that looks like jigsaw puzzle pieces. Put your nose to the bark on the sun-warmed side to enjoy the sweet fragrance similar to vanilla. The needles are long and in bundles of three. The seeds are important food for squirrels and birds. Abert squirrels (tassel-eared) require ponderosa pines to survive. The long, straight trunks were used for ancient building construction. Ponderosa pine was especially favored when constructing vigas, the main support structures of buildings, where long straight beams were required.



CURRENT (*Ribes cereum*) and gooseberry (*Ribes inerme*) are two plants that are very similar. They both belong to the same genera. The gooseberry has spines, small white flowers in May, and the berries are purple when ripe while the wax currant has no spines, golden flowers in early spring, and red berries. Berries are not as sweet as those of garden varieties. Many inedible berries resemble those that are harmless. Never sample wild plants or fruits unless you are positive of their identification. Gooseberries are often the first shrubs to have leaves in the spring. Branches were used for making bows and arrows.

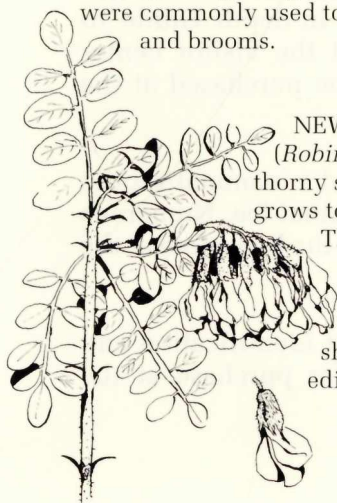


SPRING FLOWERS



SCARLET PENSTEMON (*Penstemon barbatus*) is a straight-stemmed herbaceous (non-woody) plant with scarlet tube-shaped flowers that are a favorite of hummingbirds. Also called the scarlet bugler, it is easily confused with scarlet gilia (See summer flowers).

APACHE PLUME (*Fallugia pardoza*) is a woody shrub with small white flowers that clearly show it to be a member of the rose family. The seeds are borne in fluffy pink bundles that become iridescent in sunlight and give it the name "plume." Having strong straight branches, the limbs were commonly used to make arrow shafts and brooms.

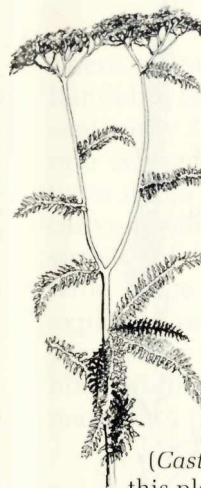


NEW MEXICO LOCUST (*Robinia neomexicana*) is a thorny shrub that sometimes grows to the size of a small tree.

The sweet-pea-shaped flowers are large, showy, and lavender. Bows and arrows were commonly made from the limbs of this shrub. The flowers are sweet and edible.



SUMMER FLOWERS

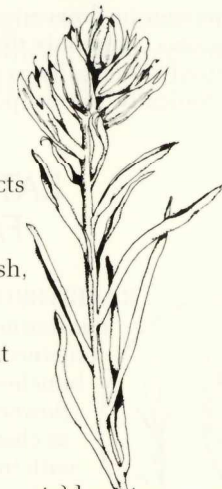


YARROW (*Achillea lanulosa*) has fern-like leaves. It is often seen on the woodland floor and gives rise to white, flat-topped flower clusters. It is a moisture lover. The name *Achillea* comes from Achilles, the famed Greek warrior. According to legend he used yarrow to treat the wounds of his soldiers. Yarrow has numerous medicinal uses including stopping the flow of blood from wounds.

INDIAN PAINTBRUSH (*Castilleja* sp.) In several ways this plant is not what it seems. The bright red "flowers" are actually bracts that surround tiny, inconspicuous true flowers. It is semi-parasitic, requiring growth in conjunction with sagebrush, gramma grass, or some other host. Hummingbirds like it anyway. No prehistoric uses are known, but today it is sometimes used to make red dye.



SCARLET GILIA (*Ipomopsis aggregata*) has star-shaped flower ends and yellow speckles which differentiate the gilia flowers from the seemingly similar scarlet penstemon. The name, *Ipomopsis* means "resembling a worm." It takes the gilia two years to go from sprouting to producing seeds. Also known as skyrocket, its bright red flowers attract hummingbirds.

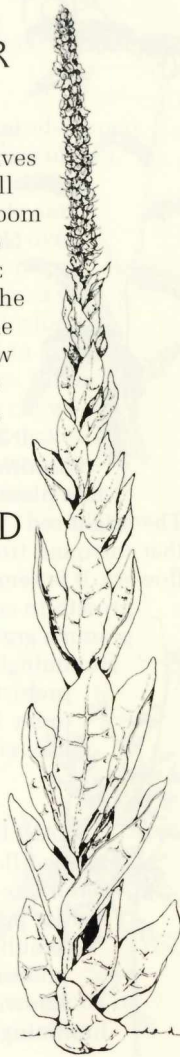
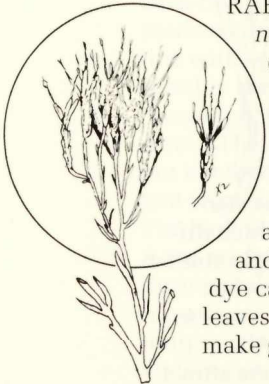


ANOTHER SUMMER FLOWER

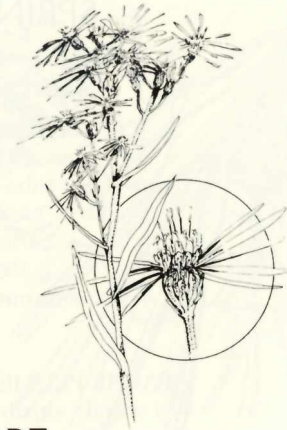
MULLEIN (*Verbascum thapsis*) has fuzzy leaves in a cabbage-like bunch which produces a tall stalk with small yellow flowers that often bloom one ring at a time. From this habit comes the common name "king's crown." It is an exotic introduced from the Mediterranean. Due to the tremendous number of seeds produced by the numerous flowers on each stalk, mullein now grows commonly throughout the area. It was used historically as a tobacco substitute and, ironically, to treat pulmonary disorders.

LATE SUMMER AND FALL FLOWERS

RABBITBRUSH (*Chrysothamnus nauseosus*) is a silvery-gray shrub crowned in late summer with bunches of feathery golden flowers. Locally it is known as chamisa. Hillsides covered with the golden flowers, glowing in the autumn light, are a hallmark of the Southwest and a favorite of artists. A yellow dye can be made from the flowers and leaves may be brewed into teas. Limbs make good arrow shafts.



PURPLE ASTER (*Aster* sp.) These purple daisy-like flowers with yellow centers stand in bright contrast to the golden chamisa and other yellow fall-blooming plants. A variety of species of asters may be found in the area.



FOR MORE INFORMATION

On Local Geology: Two free site bulletins, "Geology" and "Digging Deeper: A More In-depth Guide to Area Geology," are available at the visitor center desk. Books on the topic may be purchased at the bookstore in the visitor center.

On Wildlife: A bird checklist and a mammal/reptile checklist are available for a nominal fee. Numerous books on the topic are for sale in the bookstore at the visitor center.

On the Plants: A variety of plant identification and plant-use books are available for purchase at the visitor center.

EVIDENCE OF VOLCANIC ACTIVITY

Seeing evidence of volcanic activity over such a long period of time in this area, it seems only natural to wonder if there is likely to be more. On a geologic time scale the answer would likely be yes—some time. But in human terms, the chances are low that you would see tuff or basalt erupting from the Jemez Volcanic Field. However, hot springs in the Jemez Mountains (outside of the park) show that heat is still present, and seismic activity continues along the Rio Grande Rift. In the meantime, researchers continue to study this area to learn more about the forces that created the very special landscapes in and around Bandelier National Monument.

IF YOU LIKED THIS TRAIL

There are over 70 miles of backcountry trails within Bandelier National Monument. The Falls Trail represents only 2½ miles of the available routes. The terrain is rugged, but the views are incredible. Elevations range from 5,000 to 10,000 feet. Lush, narrow canyons alternate with sweeping mesa-top vistas. A variety of hike lengths and difficulties provide a wide range of choices for those wishing to further explore Bandelier National Monument. Backcountry permits are required for any overnight stays. Lists of hikes, information on water availability, topographic maps, and permits are available at the visitor center.