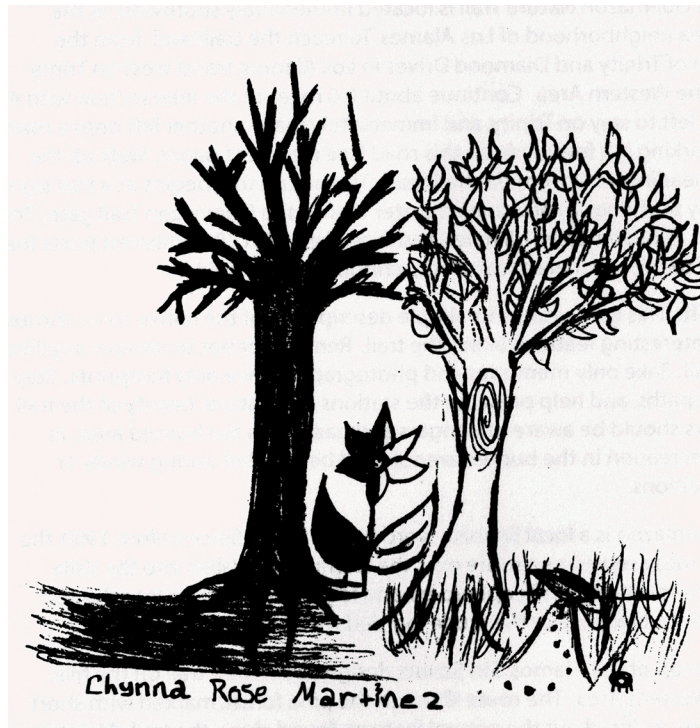


# QUEMAZON NATURE TRAIL GUIDE



REVISED BY 2004 AND 2010  
MOUNTAIN ELEMENTARY SCHOOL SIXTH GRADE

# WELCOME TO THE QUEMAZON NATURE TRAIL

**Distance:** 0.8 mile one-way, 1.6 miles roundtrip

**Elevation:** 7,450 to 7,850 feet

**Elevation Change:** 400 feet

**Seasons:** early spring to mid-winter

**Trail Surface:** rocks and packed dirt

**Management:** Los Alamos County Open Space

**Access:** The Quemazon Nature Trail is located immediately southwest of the Western Area neighborhood of Los Alamos. To reach the trail from the intersection of Trinity and Diamond drives in Los Alamos, travel west on Trinity Drive into the western area. Continue about 0.6 mile to the intersection with 48<sup>th</sup> Street. Bear left to stay on Trinity Drive, and immediately make another left onto an unnamed narrow road. Trailhead parking is a few yards along this road (see map on next page). From the trailhead, travel west on the wide dirt road located behind the information kiosk. The nature trail begins at a trail sign immediately to the south of a water tank at the green Quemazon Trail gate. The round trip is approximately 1.6 miles, and is marked with 28 numbered posts that correspond to the numbered feature descriptions in this guide.

**If you hike it:** This guide presents simple descriptions of the native trees, shrubs, and other interesting features along the trail. Remember not to remove anything from the trail. Take only memories and photographs; leave only footprints. Stay on the marked paths, and help preserve the stations and natural beauty of the trail area. Visitors should be aware of dangers and hazards in the area. In particular, recreation in the Quemazon area should be avoided during windy or stormy conditions.

**History:** Quemazon is a local Spanish word for “burned.” Since before 1900, the trail up this mesa served as a route over the Sierra de los Valles into the Valle Grande for homesteaders, shepherders, and loggers. Ruts worn in to the soft volcanic tuff are evidence of the crude log sleds used by timber men.

In 1971, a group of Los Alamos Girl Scouts designed a nature trail on the hills above the Western Area. The route through the pine forest, marked with short wooden posts, pointed out the natural features found along the trail. Maintained over the years by local Boy and Girl Scouts as well as neighborhood residents, the trail is a local favorite.

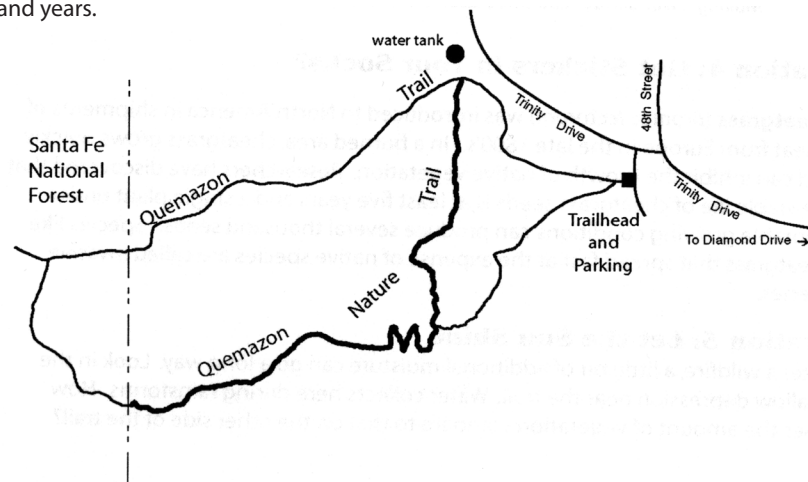
Majestic ponderosa pines, spaced at neighborly distances, once covered the mesa above Los Alamos Canyon. The grasses between the tall trees carried a low-intensity ground fire every seven to fifteen years. The surface fires helped maintain the open nature of the forest. Since about 1900, fire was excluded from the forest. Local shepherds and businessmen set up grazing and logging operations on the mesa. These factors permitted the trees to grow in unnaturally dense stands. When the Cerro Grande fire blew across Los Alamos Canyon on May 10, 2000 the

flames exploded into the tops of the pines. The resulting crown fire left behind a black forest and a thick layer of ash covering the ground.

The mesa is now covered with thick grasses. Slender wheatgrass, seeded in the post-fire restoration effort, held soil on the slopes and permitted native grasses to re-establish. Patches of rusty brown little bluestem, pine dropseed, and mountain muhly now dominate the slopes. Ponderosa pine saplings, planted by volunteers in April 2001, as scattered across the mesas. Aspen groves dominate the mid-elevation slopes. Sprouting from roots of burned trees, some of the young aspens exceeded 12 feet in height only eight years after the fire.

Searching for a way to involve their sixth-grade students in post-fire recovery, Mountain Elementary teachers Laura Patterson and Gerry Washburn began the rebuilding of the nature trail in September 2000. With the assistance of the Volunteer Task Force, Mountain sixth-grade students carefully relocated the trail, cleared it of debris, and constructed rock walls and switchbacks. In the following years, students planted ponderosa pine seedlings, aspen trees, native grasses and wildflowers. They improved the trail construction, cleared fallen trees, and redeveloped the trail guide to fit the changed landscape, all while studying and monitoring the recovery of the forest. Los Alamos County officially reopened the Quemazon Nature Trail on May 22, 2004. Realizing the rapid changes that occurred along the trail, Mountain sixth graders again revised the trail guide in 2010. The re-construction of the trail by more than 250 Mountain School students is testimony to the power of community service. Los Alamos extends its sincere thanks to the teachers and students of Mountain Elementary who re-built the Quemazon Nature Trail.

**Geological Features:** The Jemez Mountains, relative youngsters in geologic time, began forming 16 million years ago. The Jemez range is an accumulated pile of volcanic rocks. The eruptive sequence culminated in a dramatic series of eruptions that created the Valles Caldera. Formation of the caldera 1.2 million years ago and the post-caldera eruptions—as recent as 50,000 years ago—represent the latest episodes of volcanic activity. The Quemazon Trail crosses a segment of the Pajarito fault zone. Where it strikes north to northeast along the western margin of Los Alamos National Laboratory, the Pajarito fault forms the active western boundary of the Rio Grande rift. Geologists believe the fault has the potential for generating large (about magnitude 7) earthquakes, but only every several thousand years.



## STATION 1: WHERE ARE THE TREES?

Before the Cerro Grande Fire, these hills supported about 500 ponderosa pine trees per acre. The fire was particularly intense here, killing up to 80% of the pines. The burned trees in this area were cut and chipped to help curb erosion and restore the native plants. Eventually the remaining burnt trees will fall, creating a grassy meadow.

## STATION 2: PLAYING DETECTIVE

As you walk along the trail today, watch for the original wooden trail markers. Pretend you are a detective looking for clues of plant and wildlife in the area. Do you see any evidence of plants or insects that wildlife might feed on? Can you name one plant or animal visible from here? What poisonous plant can you identify? If you guessed poison ivy, you're right!

**Poison Ivy** (*Toxicodendron radicans*) CAUTION: Do not touch! Poison ivy is a low-growing under-shrub with white berries. The leaves are smooth and drooping. The leaflets are bright green, turning orange to red in the autumn. Berries are toxic to man but are eaten by many species of birds.



## STATION 3: IT'S A BIRD'S WORLD

Many different species of birds live in the burned area, notably the Western and Mountain Bluebirds, Ash-throated Flycatchers, Mountain Chickadees, Rock Wrens, several species of woodpecker, and the Common Raven. Most of the birds use snags (standing, dead trees) like the one nearby for food, nesting, or shelter.

*Ponderosa pines and thinking minds  
Bluebirds sing for the boxes we bring  
Beautiful colors from dawn to dusk  
Making smiles on every one of us  
Hatchlings hatch during the spring  
Making a wonderful, beautiful, bluebird team. (Marina, 2004)*

## STATION 4: GOT STICKERS IN YOUR SOCKS?

**Cheatgrass** (*Bromus tectorum*) was introduced to North America in shipments of wheat from Europe in the late 1800's. In a burned area, cheatgrass can grow quickly and can inhibit the growth of native vegetation. Along the trails, this happened in small, isolated spots. Researchers have discovered that the viable life of cheat grass seeds is at least five years and a single plant under favorable growing conditions can produce several thousand seeds. Species like cheatgrass that spread fast at the expense of native species are called invasive species.

## STATION 5: LET THE SUN SHINE

After a wildfire, a little bit of additional moisture can go a long way. Look in the shallow depression near the trail. Water collects here during rainstorms. How does the amount of vegetation compare to that on the other side of the trail?

*As the dawn sun rises and the flowers color  
Bursting glare  
The sweet smell freshens the ever-cooling air  
The wild rose and sage appear  
Don't look far because they are near (Molly, 2004)*

**Wild Rose** (*Rosa woodsii*) is a common thorny shrub with showy clusters of two-inch, pink flowers blooming from July to August. The red-colored false fruits are called rosehips, which are rich in Vitamin C and eaten by many kinds of birds..

**Big Bluestem, Turkeyfoot** (*Andropogon gerardii*) has side stems attached at different points along the main stem. The flowers are all on one side of the stem. The seed heads resemble little flags or combs. Unlike the invasive cheatgrass, this uncommon native grass grows in a small, isolated cluster of stems.

## STATION 6: PIPELINE CUT

The Quemazon Trail has a long history of timber operations. For a time in the 1920's, H.T. McCurdy logged here; his mill was located at the upper end of Pueblo Canyon. In the 1920s and 1930s the Los Alamos Ranch School for Boys had permits from the Forest Service to cut wood in this area. Manhattan Project and Atomic Energy Commission personnel also cut many trees in along the trail. On the main Quemazon Trail the flat tuff bears deep ruts made by innumerable logging sleds and trucks.

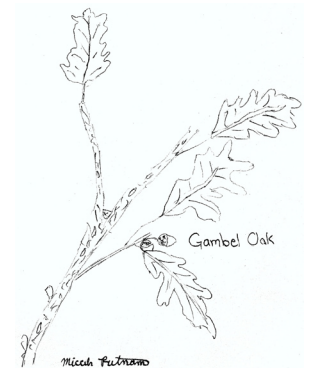
**Wild Onion** (*Allium cernuum*) has a flowering stem up to two feet tall. The white to rose-colored flowers are found in umbrella-like clusters at the top of the stems. Wild onions were long used by Native Americans for food and seasonings. They are prolific seeders, springing up in abundance in recently burned areas.

**Goldenrod** (*Solidago sp.*) is recognizable by very small yellow flower heads arranged either in pyramidal clusters or on one side of the stem. Goldenrods are late summer and fall bloomers.

## STATION 7: RESTORATION WORK

Mountain School students built these rock dams in 2002 to help curb post-fire erosion. The dams slow and hold surface water long enough to deposit transported sediment and reduce the amount of soil erosion.

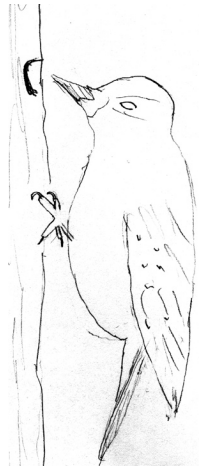
**Gambel Oak** (*Quercus gambelii*), a small tree, has strongly lobed leaves up to seven inches long and that turn yellow and brown in the fall. The plants produce acorns that are a favorite food of wild turkeys and acorn woodpeckers.



**Gayfeather** (*Liatris punctata*) has stems to 18 inches. The flowers are rose-purple, and flower heads are clustered along the stem. The leaves are linear and are most at base of the plant. The heads have four to six flowers.

### STATION 8: I SPY, OR MAYBE, I HEAR

If you look out you'll find a hilly terrain and emptied streams that no longer flow.  
The birds and the valiant sky show how proud and beautiful the nature trail really is (Micah, 2004)



Do you see or hear any evidence of woodpeckers at this site?

**Acorn woodpeckers** prefer open pine forests and areas with recent forest fires. This bird is responsible for eating many destructive forest insects. They have a long barbed tongue that helps them extract insects from trees. Male and females will drum on branches or hollow logs to announce territories, which are rarely larger than five acres.

**Scarlet Trumpet, Skyrocket** (*Ipomopsis aggregate*) is a biennial, which means that during its first year it only grows a rosette of leaves at the base of the plant. During the second year it sends up a tall, erect stem bearing pinnately divided leaves. Flowers are red, mottled with yellow, and the stamens extend beyond the petals. Some southwestern tribes reportedly used this plant medicinally and for ceremonies. The bright red color attracts hummingbirds.

### STATION 9: BEAUTIFUL SUNSHINE

Beautiful sunshine  
Beautiful scenery  
Every wildflower blooming  
Every ponderosa pine reaching to the sky  
Mountain Bluebirds singing in the blue glazing sky  
It's the Quemazon Trail (Michal, 2004)

**Kinnikinnik** (*Arctostaphylos uva-ursi*) is a mat-forming evergreen shrub. The leaves are shiny green and leathery. Flowers are tiny, urn-shaped, and white to pink. Fruits are red and grow in clusters. Early settlers and Indians called the plant *coralillo* and used the leaves as a substitute for tobacco. It was pulverized, carried in pouches, and became known as *knick-knack*, giving the common name, kinnikinnik.

### STATION 10: OLD AND NEW PONDEROSA PINES

Below the trail is a stand of mature ponderosa pines. Why do you think these trees were spared by the fire that raced through this area? Watch for sapling ponderosa pines along the trail that were planted to provide a source of seed to hasten the regrowth of the pine forest. The trees,

more than 3,000 of them in this area, were planted by volunteers from Los Alamos, Santa Fe, Taos, Pojoaque, and other communities in northern New Mexico.

Look up in the treetop  
For some movement light and blue.  
But make sure you look fast  
Or it might get away from you. (Molly, 2004)

Can you see the vibrant bluebird soaring peacefully in the baby-blue sky?  
Can you see the light green trees with a touch of sunlight swaying in the breeze?  
Can you see and feel the beauty of the Quemazon Trail? (Deserae, 2004)

### STATION 11: REJUVENATION

The burned trail  
Dead trees everywhere  
But as you look around  
You see little sprigs of hope  
Poking up into the desolation  
A little green leaf  
Wondering if it came up in the wrong world  
But it looks around  
It notices that it is not alone  
There are others  
Slowly rejuvenating the  
Destructed forest (Zoe, 2004)

**Wooten Butterweed** (*Senecio wootonii*) provided the first post-fire wildflower display along the trail and continues to do so each spring. Its yellow flowers seem to explode from the ground. You can identify the plant by its broad, sawtooth, oval leaves growing in a clump from the ground.

### STATION 12: WATER ON A BURNED LANDSCAPE

This stream is intermittent; it doesn't always flow. When would you most likely see water here? This area serves as a home for many diverse species of birds, lizards, and bugs. How many have you seen?

**Common Ravens** are large, all-black birds with a large black bill, a shaggy beard of feathers on the chin and throat, and a large wedge-shaped tail. Some consider it to be the smartest of all birds. It is known for its aerial acrobatics and long swooping dives. Did you know ravens can count to eight?

**Stellar's Jays** have dark blue wings, tail and belly. They have black heads, napes of the neck, and chests. The large pointed black crest on the head can be lifted at will. They are thought to mate for life, rarely dispersing far, usually breeding within ten miles of place of their birth.



**Western Scrub Jays** have blue heads, wings, tails and breast bands with a brownish patch on the back. It has a dull white chin, breast and belly. The tail is very long. They form a long-term pair bond, with the male feeding the female before and during incubation. Scrub Jays cache food by burying it for later consumption. They likely serve as a major distributor of oaks and pines seeds.

**Robins** are familiar gray birds with rusty red breasts and a nearly black head and tail. They have white chins with black streaks and white eye-

rings. The female is similar to the male, but with a gray head and a duller breast. It is a year-round resident in New Mexico.

### STATION 13: BROKEN TREES

How many leaning trees do you see? How many broken trees do you see? When a crown fire kills a tree, the trunk and large branches are not consumed. As years go by, the roots and trunk of the dead tree slowly rot. Most of the trees killed by a fire fall in the first ten years after the fire. How many standing trees remain in this area?

*Thousands of feet churning up dust  
Disturbing quiet fields of yellow flowers  
Splotches of purple  
Smears of bright green  
And shiny silver sticks and branches  
Dusty tired yellow grass  
Sways in the almost non-existent breeze  
A fire swept through burning all  
Now there is life. (Lynn, 2004)*

### STATION 14: BARK BEETLES

Bark beetles live and feed underneath a tree's bark. The first beetles that arrive at a tree emit a scent that attracts other adult beetles. The adults bore through the bark, mate and lay their eggs. When the eggs hatch, the numerous larvae begin feeding on the inner bark, girdling the tree. A "blue stain" fungus carried by the beetles contributes to the death of a tree by clogging water-conducting tissues.

Look for signs of bark beetles. You can find sawdust at the base of the tree or in crevices in the bark, small popcorn like masses of sap (called "pitch tubes"), and small boring holes where beetles have entered the tree. A month after being attacked, the needles on an infested tree will

begin to change color or fade.

What happens once a tree dies? Within three to six months after a tree dies, its needles drop to the ground. The snag can stand for between two and six years before falling to the ground. Drought and fire both have contributed to the problem. From about mid-July, through August and into September the beetles can be seen flying about on warm, calm afternoons. You have to look very close: bark beetles are only about the size of a pencil point.

### STATION 15: CANYON VIEWPOINT

Along this part of the trail, the view is amazing. Gambel oak is very plentiful. Fallen trees show us what was lost in 2000. There are signs of woodpeckers from the holes in the trees.

*The Quemazon Trail is full of color, from Azure blue skies to green patches of grass. To everybody, color is different. Color is the drop of sunshine falling upon your face. Or maybe it's the blue in your drinking cup. Everything is color, even the black on the bark of the burnt trees. Yes, full of wonderful color that fills my eyes with joy and happiness. (Micah, 2004)*

### STATION 16: MIXED CONIFERS

**Douglas Fir** (*Psuedotsuga menziesii*) and ponderosa pine dominate the forest canopy in this mixed conifer forest. Near Los Alamos, mixed conifer forest occurs mostly above 7,500 feet elevation. Douglas fir, which is not a true fir, has short, flat needles and can grow up to two hundred feet tall. It bears cones that hang down from the branches and have papery bracts protruding from between the scales. During the Cerro Grande fire, Douglas fir in this area served as a ladder fuel. Fire on the ground found a route to the tops of the tall ponderosa pines by jumping up the ladder of smaller firs.

### STATION 17: TRAIL WORK

Notice the switchbacks in the trail design. Switchbacks are the most convenient way of gaining or losing altitude. They also eliminate trail segments that go straight up and down a slope, which can funnel water along its path and increase erosion.

### STATION 18: SMELL THE TREES!

When you pass by a tree, do you smell it? It is a constant argument whether certain trees smell like vanilla or butterscotch, but that's a matter of opinion. The smell comes from the oil in the bark. Next time you pass a ponderosa pine, stick your nose in the bark. You decide!



**Ponderosa Pine** (*Pinus ponderosa*) is the most common evergreen tree species along the trail. Often growing to a height of more than 125 feet, under favorable conditions a ponderosa pine can live to be well over 300 years old. In times of need Puebloans and other groups of Indians in the Southwest would chew the soft inner bark, or cambium, of the ponderosa for its nutritional value.

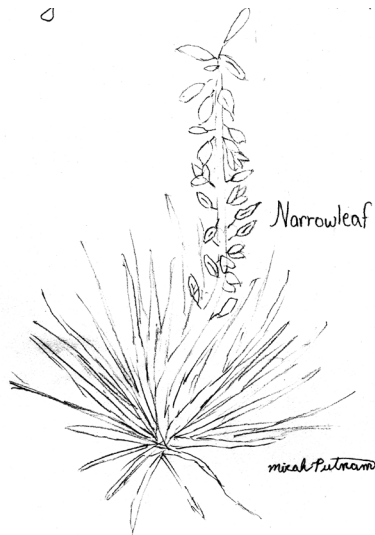


*Quemazon Trail*  
*A long winding brown dusty trail*  
*Wildflowers hidden in bunches of cheat grass*  
*Ponderosa pines tiring*  
*The view from the top is splendid and beautiful*  
*Bluebirds sing from their homemade birdhouses*  
*Don't say goodbye (Rebecca, 2004)*

### STATION 19: HOME OF THE YELLOW SPOTTED LIZARD!

The recovery of plants is accompanied by the recovery of insects, reptiles, birds, and mammals. Immediately following a fire, only large mammals and birds are found in the burned area. It takes years for reptiles and small mammals to find homes in the burn.

**Banana Yucca** (*Yucca baccata*) This plant is widespread on the Pajarito Plateau and in the Rio Grande Valley. It is easily recognized by its broad, stiff, succulent leaves, which are up to three inches wide. It produces creamy white flowers on a single erect stalk in late spring, followed by a series of large, fleshy green fruits that usually remain on the stalk until consumed by wildlife. The thick, sweet fruit of the banana yucca formed a staple of prehistoric diets throughout the region. The "bananas" would have been eaten green or dried and stored for winter use. The use of yucca fiber for matting and in basketry was and is widespread among the Pueblo Indians. The root of this plant is still regularly sought by Pueblo Indians for making a hair shampoo.



*Quiet*  
*Under the worn yellow sun*  
*Encourages learning of natural science*  
*Magnifies the city view*  
*A nice place to talk with friends*  
*Zooming in on the natural life*  
*On top of a hill*  
*No one can bother you*

*TRAIL ROCKS! (Clarke, 2004)*

### STATION 20: RECOVERY AFTER A WILDFIRE

Sometimes it is difficult to see the rebirth of a forest after a devastating fire. The speed and extent of recovery depend on the severity of the fire, when it occurred, and the plant community through which it burned. Many plants in the ponderosa pine forest are adapted to

recover quickly following a fire. The root systems of many plants run deep into the soil where they are protected from lethal temperatures. Once the above ground stem is removed by fire, roots are stimulated to send up new shoots. The soil profile may contain many dormant seeds waiting for the right conditions to germinate and grow. Notice the Gambel oak and aspen along the trail. Their adaptations to an ecosystem maintained by fire has allowed them to thrive here. Clumps of orange-brown little bluestem demonstrate the ability of many grasses to respond favorably after a wildfire.

*Thousands of feet churning up dust*  
*Disturbing quiet fields of yellow flowers*  
*Splotches of purple*  
*Smears of bright green*  
*Shiny silver sticks and branches*  
*Dusty tired yellow grasses*  
*Sways in the almost non-existent breeze*  
*A fire swept through burning all*  
*Now there is life (Lynn, 2004)*

### STATION 21: LOS ALAMOS CANYON

How did the Cerro Grande fire leave the mesa top on the opposite side of the canyon untouched while this side is so burned? The fire was driven by a fierce wind coming from the direction of the other canyon wall. The wind carried firebrands, burning clumps of pine needles or cones or bark, into the canyon bottom. Fires burn faster uphill, so the flames raced up the canyon wall. The strong wind kept the flames from the mesatop across the canyon, but pushed the fire onto the mesatop on this side.

### STATION 22: HOW OLD WAS THIS TREE WHEN IT FELL?

Tree growth depends on environmental factors including location, surrounding foliage, water and temperature. The yearly variance of these factors are shown in a tree's annual growth rings. Counting these growth rings gives an accurate account of a tree's age, but tree rings can tell you much more. Wider rings represent years of greater growth, usually spurred on by lots of precipitation. Narrow rings indicate less growth due to drought or cold cycles. During what time frame did this tree have plenty of water? Can you find the rings that were formed during the 10-year drought in the 1950s? What were the conditions in the years immediately before the Cerro Grande fire?

### STATION 23: PROBLEMS THAT COME AFTER A WILDFIRE

When a wildfire removed all the vegetation from a landscape, the environmental problems have just begun. With no vegetation to protect soil, or to help absorb precipitation, every rainstorm brings a black flood of ash, charred wood, soil, and debris. To help reduce the flow of water across the landscape, post-fire rehabilitation crews lay logs across slope and build rock dams.

**Mountain mahogany** (*Cercocarpus montanus*) is the most common shrub found in the burned area. The plant has many thin stems growing from the roots in a clump. The leaves

are oval and hairy on the underside. In summer, the feathery fruits of mountain mahogany make it easy to identify. The wood of this plant is very hard. It is used as browse by deer and elk.



#### **STATION 24: HAZARDS FOLLOW A WILDFIRE NEEDS NEW MESSAGE**

*Fire in the morning  
Always burning bright  
Fire burning through the night  
Rolling the dark night sky  
Like a tiger prowling in the light  
Fire is a crying bird  
Calling to put out  
Fire is a destroyer  
Yet also a wonderful object of hope and health  
Fire in the morning  
Fire in the night*

*Fire driving everything out of sight. (Colleen, 2004)*

#### **STATION 25: TALL GRASSES**

Another way to reduce erosion after a wildfire is to start growing grass as soon as possible. The fast-growing roots of grasses can hold soil particles together and prevent them from washing away in a rainstorm. Many acres of this forest received grass seeds dropped from airplanes following the Cerro Grande fire. Off the trail are clumps of slender wheatgrass that grew from such seeding. This species held the soil and allowed native species like mountain muhly to reestablish.

*When you imagine a tranquil forest, the Quemazon Trail does not come to mind.  
With its black, and lifeless appearance, but  
Topped with a lapis sky, the recovering trail develops its own distinct beauty. (Jesse, 2004)*

*Look beyond the burned trees, and surrounding black  
Yet imagine evergreen trees full of vibrant bluebirds fluttering about.  
Think about green trees, and beautiful, colorful flowers of beauty. (Georgina, 2004)*

#### **STATION 26: WOODPECKER ATTACK!**

Can you see all those little round holes in the surrounding trees? Woodpeckers made the holes. Listen for their drumming.

#### **STATION 27: ACROSS THE CANYON**

The stillness of the canyon edge today is a sharp contrast to what it must have been like here on May 10, 2000. Imagine the roar of the fire as it raced up the slopes..

*Quiet  
Completely still  
The song of birds  
Soar over me  
And twirl around me  
The slight breeze spreads  
A few strands of my light brown hair across my face.  
The sun filters through the long, green, pine needles  
The tall Ponderosa pine  
kiss my legs with warmth.  
Comfortable on the rock that I lay on  
I think with my eyes still shut  
This must be the most peaceful place on earth  
I hope it stays that way. (Bethany, 2004)*

#### **STATION 28: TAKE TIME TO OBSERVE**

Wildfire is a process that is an integral part of the ponderosa pine forest. When such an ecosystem is unbalanced by human or other disturbance, the nature of fire can turn from sustaining to devastating. In the long term, as this landscape shows 10 years after the such a fire came through, the forest will recover.

*The hills soar  
The canyons hide in their shadows  
Take a while to observe the nature  
Look across the deep canyons.  
Azure blue skies bring life and beauty to the trail.  
An assortment of  
Golden rod, wild lettuce, shrubs  
Cover the terrain  
With impeccable color. (Micah)*

**Text, artwork, and poetry by the 2004 and 2010 sixth grade classes at Mountain Elementary School, Los Alamos, New Mexico**

