

# BLUE MOUNTAIN NATURE TRAIL

## A Fire Story



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**In 2003**, on Black Mountain just to the northwest, lightning ignited a wildfire that eventually burned across 7,000 acres ending here at the Blue Mountain Nature Trail. Because of this event, we have a unique chance to observe close-up how fire affects a ponderosa pine and Douglas-fir forest community.

Follow the story fire has written on the landscape. Can you see where the fire left its mark? If you visited the trail right after the fire, you would have seen only blackened soil with no live, green plants below the trees.

Now, a few years after the fire, you can see blackened trees, bark beetles, lots of woodpecker feeding areas, and abundant wildflowers carpeting the ground. As you walk, take note of clues to the fire's path. Try to find evidence where the fire burned, which trees survived, which plants might benefit from fire. This trail guide helps unravel the mystery of how Rocky Mountain plants and animals, not only survive the flames, but also



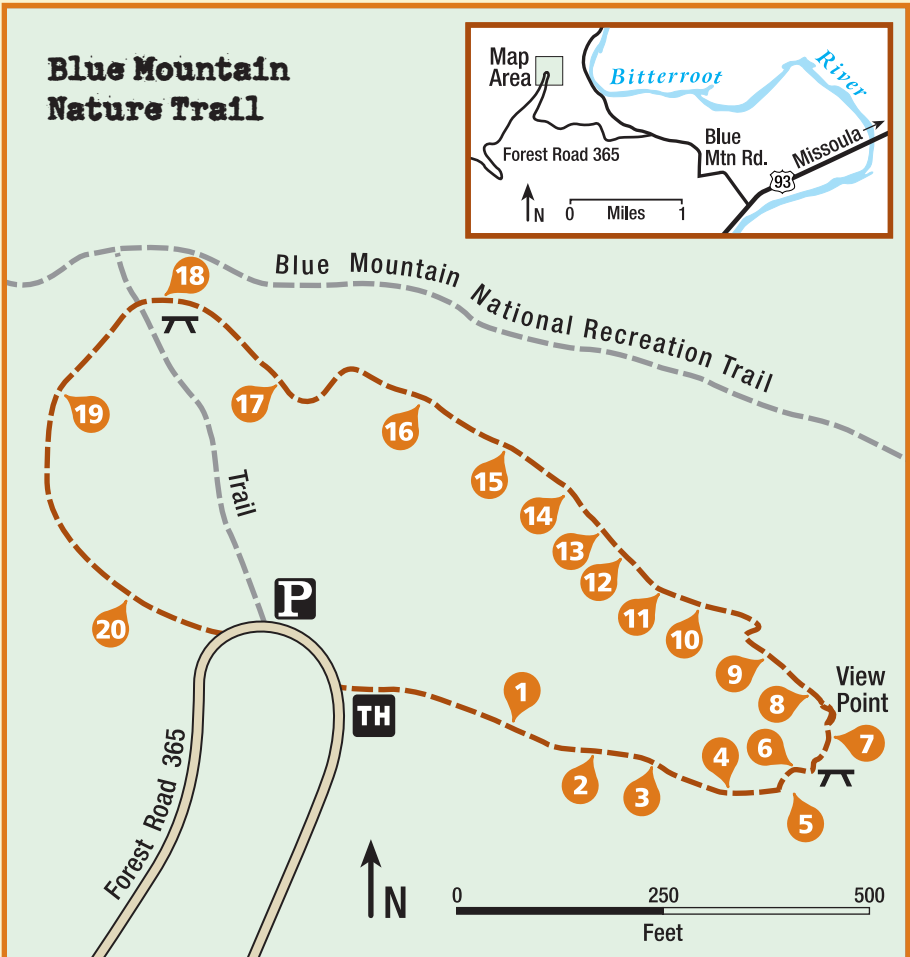
*Black-backed Woodpecker*

thrive after fire. Whenever you visit a forest that has recently burned, you'll see amazing evidence of fire's rejuvenating force on the landscape.

# BLUE MOUNTAIN NATURE TRAIL MAP

**Take a walk** along this 1/4-mile nature trail loop and read the stories in this brochure that correspond to each of the 20 numbered posts. If you have a little more time, be sure to walk up the hill

on the Blue Mountain National Recreation Trail. There you'll see where the fire burned so intensely that it killed many of the trees. Notice the lush sea of fireweed and pinegrass underneath the blackened trees.





## Bent Tree

### Can you guess what happened to this tree?

Many years ago, when this tree was young, an older tree fell on it and pinned it to the ground. While the dead fallen tree slowly rotted away,

the sapling continued to grow, never losing the mark from its earlier life. You can see where fire blackened the pine's trunk without killing the tree – thanks to its fire-resistant bark. What makes the bark so fireproof? Keep walking to find the answer.





### What makes this ponderosa pine forest look so open and park-like?

Fire. When understory fires burn frequently through a pine forest, the larger trees are barely touched, but the wildflowers, shrubs and smaller trees are usually consumed. When the Black Mountain Fire reached the trail, it remained on the ground and barely singed the bark of these old pines.



*Fireweed*



## Fire-proof Pine



### What physical characteristics help a ponderosa pine survive a fire?

Its thick, corky bark acts like insulation. Its long needles, clustered in groups of three, protect the growing buds. As it grows, it loses its lower branches, which helps keep a fire from reaching and killing the crown of the pine.



*Ponderosa Bark*



### **Why did this clump of young pines not survive the fire?**

Growing all clumped together, the young ponderosa pines burned easily.

If saplings grow under big pines when a fire runs through, the flames can climb up the “ladder” of saplings into the needles of the old pines and kill them.



## Scarred by Fire



### How do we know if fires have burned through the area in the past?

Fire Scars. A fire scar forms when a fire burns deeply into a tree trunk. Each subsequent year, the tree grows gradually over the edges of the scar, which looks like a black triangle at the base of the tree. Scientists use fire-scarred trees to determine not only the dates of past fires over the course of many centuries, but also the time interval between fires.

*Fire Scar*





*Black Mountain Fire*

**If fire burns periodically through a forest, how do young trees ever survive to be old trees?**

Sometimes a fire burns uniformly, perhaps driven by wind across a slope, but usually a fire burns in a mosaic pattern burning some areas and leaving patches unburned where seedlings and saplings survive.





*Fort Missoula, Missoula, MT, ca. 1920s*

### **Do you think there are more trees in the valley and hillsides today than there were 100 years ago?**

Look across the valley from this overlook and you'll certainly see more houses. Also, fire suppression for the last 50 years or so has allowed young

trees to grow on once grassy hillsides. Imagine how it was to live here 100 years ago.



### How does Douglas-fir fair after a fire?

A young Douglas-fir has thin bark and low-hanging, needle-covered branches that often touch the ground, which make it especially vulnerable to fire. However, a big, old Douglas fir has thick, corky bark that can help it survive.





*Red Squirrel*

**Do you think this rocky spot might provide small animals a refuge?**

Chipmunks and red squirrels can hide beneath the rocks in burrows to escape a fire. Rocky areas offer little soil for plants to grow, so when a fire moves through, there's little to burn. Along the trail, look for these small mammals perched on rocks, logs or tree branches.



*Ninebark*

### How do shrubs survive a fire?

They store nutrients in their underground roots and can sprout new stems with the first rains. Look around and see if you can find a ninebark shrub. They have striped

stems. After a fire, with the release of nutrients in the ash, ample sunlight and little competition, shrubs put on tremendous growth by re-sprouting from underground.



## Fire Moss



### **Why is the ground covered with moss after a fire?**

A hot, severe fire can blacken the ground, removing everything in its path. One of the first plants to grow back after a fire is moss. “Fire” moss,

taking advantage of the newly bare, nutrient-rich soil, often carpets the ground after fire. With time, as other plants slowly re-sprout and grow, fire moss gets shaded out and disappears until the next fire.

### Why are morel mushrooms so plentiful after a fire?

Mushrooms need fire. The black morel produces its fruit, or mushroom, only the first year after a fire. The underground portion, called mycelia, survives for years without bearing fruit, but will only produce a mushroom after fire heats the soil. Deer, chipmunks, and even people, feast on tasty morels.

*Morel Mushroom*





## Full of Holes

### Why are there so many holes on the ground after a fire?

Be careful where you walk in this burn. It's full of root holes. That's all that's left of a tree after a fire burns hot and long down into the roots. These root holes make good nesting sites for Townsend's Solitaires and Mountain Bluebirds. Do you think small mammals might also use them? You can still see evidence of these root holes as you walk along the trail.



*Mountain Bluebird*







*Pileated Woodpecker*

### Can you find trees with flaked bark or woodpecker holes?

These are signs that beetles live beneath the bark or within the wood. Woodpeckers flake bark away from the tree to reach the beetle grub beneath. Wood-boring beetles find burning or recently burned trees by sensing heat, or infrared radiation. Once there, they find a mate and the females deposit their eggs under the bark of the dead or dying trees. After hatching, larvae remain in the dead tree for one to three years before tunneling out to emerge as adult beetles. Then they fly off in search of another recently burned site.



*Wood-boring beetle*



### What might attract these forest dwelling songbirds to the burn?

Many songbirds, such as Dark-eyed Juncos, occur more frequently in burned than in unburned forests. Possibly fewer predators make it easier for juncos to successfully raise young. Also look for Black-backed Woodpecker, Western Tanager, Mountain Bluebird, Western Wood-Pewee, and Townsend's Solitaire, all species that occur more frequently after a fire.



*Top photo: Dark-eyed Junco*

*Bottom photo: Western Tanager*

## Do weeds always show up after fire?

Sometimes when a fire burns hot or the soil has been disturbed, weeds can invade from nearby roadsides or trails. At this site, you can find small patches of woolly mullein, spotted knapweed, and leafy spurge growing amid the native grasses and wildflowers. Native plants can usually out grow weeds if there's not too much soil disturbance after fire.



*Spotted Knapweed*

*Woolly Mullein*





### Why is there so much grass here?

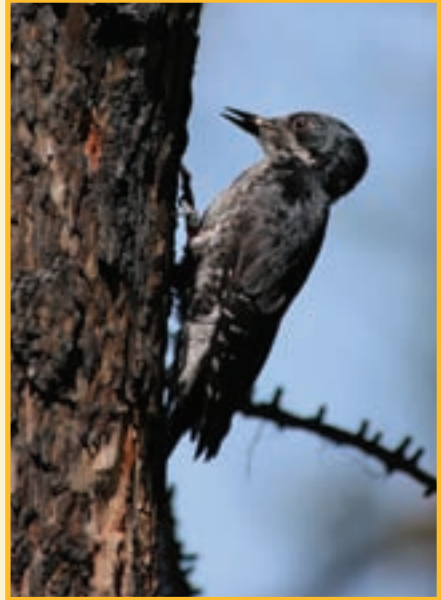
This fire produced a sea of grass. Pinegrass growing in a shady forest rarely flowers because so little sunlight reaches the forest floor. Pinegrass is a rhizomatous grass that

has its growth points located under litter or within the soil so it survives most fires. Only after a fire does the sun-warmed, nutrient-laden, and open soil spur pinegrass to flourish and set seed.

### Why are there so many woodpeckers here now?

In winter, Black-backed, Three-toed, Pileated, Hairy, and Downy woodpeckers gather in large groups in burned forests to take advantage of the beetle bonanza. Look at the trees around you. Many are stripped of bark by woodpeckers feeding on wood-boring and bark beetles. In fact, the Black-backed Woodpecker could be considered fire dependent because it's hard to find it in any habitats other than severely burned forests.

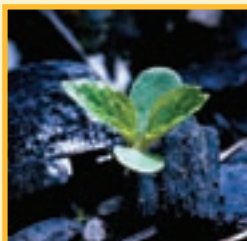
*Black-backed Woodpecker*



*Miner's Lettuce*

### Why are some plants common only after a fire?

Some plants that live here, such as miner's lettuce and Bicknell's geranium, produce seeds that won't grow for dozens of years or more until fire burns over the soil. Redstem ceanothus seeds can remain alive, but dormant, in the soil for 100 years. Only fire will reawaken them by crack-

*Redstem  
Ceanothus*

ing open their hard seed coat and, with sufficient rainfall, encourage their germination and growth.

## 20 Mass Flowering

### Why do wildflowers love fire?

Imagine this hillside covered in a sea of yellow flowers. After a fire, heartleaf arnica can put on quite a show in June. Rarely can you find so many flowers carpeting a hillside. Fed by rich nutrients, warm soil and abundant sunlight, many wildflowers such as arnica, arrowleaf balsamroot, glacier lily and fireweed mass flower after a fire. It's a spectacular display that occurs only after a fire.

*Arrowleaf Balsamroot*



*Heartleaf Arnica*



*Students learn about Blue Mountain's fire story through journaling.*



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