

# Environmental Education Teaching Games

## Fire: A Burning Issue



Dave Sutherland  
Community Naturalist, Boulder Colorado  
dsutherland4747@gmail.com

Many more great free resources at [www.DaveSutherland.CO](http://www.DaveSutherland.CO)

### Sample themes for forest fire programs:

- Fires in prairies or forests can have a good side as well as a bad side.
- Although trees are good, too many can be a bad thing for the forest and its animals.
- Returning fires to our native ecosystems can help plants, wildlife and people.
- Prescribed fires are an important way to take care of the land and ensure human safety.

Fire is becoming an ever-increasing risk in Colorado's mountains, and a topic of great concern for resource managers. And rightly so: fire can be both friend and foe to people and to the forest or grassland. For many years, Smokey Bear has told us that fires are bad; now scientists realize that fire is an essential part of native ecosystems. Helping Colorado's residents better understand the complexities of fire may save lives and property, result in healthier ecosystems and ultimately simplify the work of land managers.

### As a friend, fire can:

- Thin the forest, favoring old growth trees;
- Remove "duff" from the forest floor or dead material from the prairie, stimulating renewed growth;
- Improve wildlife habitat;
- Create a "mosaic" of diverse habitat types, favoring increased biodiversity;
- (Paradoxically) reduce the risk of future wildfires;
- Recycle nutrients and fertilize forest or prairie soils.

### As a foe, fire can:

- Jeopardize lives and property;
- Create soil erosion;
- Cost huge amounts of money and resources for fire suppression (money which we'd rather see spent on education programming!).

Wild fires are out-of-control destructive events. Prescribed fire, often coupled with tree thinning, is a strategy that lets resource managers take advantage of fire's benefits while minimizing its dangers.



Wildfire is a fact of life in Colorado, and has been for thousands of years. Our forests and prairies are adapted to fire and actually require it. Any given patch of dry forest will burn eventually: this

is nature's way. Prescribed fires let people control the conditions, timing and magnitude of the inevitable fires, rather than leaving these details up to chance. As a result, humans and wild inhabitants can all benefit.

The following activities and games will help people understand the complex and contradictory nature of fire: that certain fires at certain times and in certain places are good for forests, prairies and people, while other fires can be deadly and damaging.

**Circle of life:** This is my favorite activity to start an ecosystem hike, and it lends itself to interpretation of fire as an interconnected part of a healthy natural ecosystem. You can use the principle of interconnectedness it as an overarching metaphor during your entire program.

Every participant chooses to represent an element of a forest or prairie ecosystem: favorite plants, animals, air, water, etc. Make sure that fire is part of the group, even if you have to choose it for yourself. Everyone forms a circle by holding hands. Stretch the circle to its very greatest extent. Everyone in the circle then leans back on their heels. They would fall on their butts except for the pull of other members in the circle.

Ask participants what would happen if the water is polluted, and can't be in circle anymore. Yank the person representing water out and let the circle collapse. Then repeat by focusing on fire as an element of the ecosystem. "What if forest fires are taken from the circle?" By removing the person representing fire, you cause the circle to collapse again. This is a wonderful introduction to the importance of fire and can shape a discussion.

**The Tree Thinning Jam:** Historically, frequent low-intensity wild fires swept through dry low elevation forests and across prairies in Colorado. These fires destroyed many small trees but were not hot enough to kill most of the adult trees or deep-rooted prairie plants. As a result, tree density was kept low and trees were generally able to obtain enough water, nutrients and sun to grow large and live a long time. Fire was a vital part of old growth pine forests, and helped keep grasslands free of trees.

Fire suppression began in earnest in Colorado about 80 years ago, and many areas have not been allowed to burn since. All the little trees that should have been thinned by periodic fires have thus grown up into dense "dog hair" stands of spindly trees. Stressed for resources, these trees are prone to disease epidemics. When they burn, they generate very high temperatures that are beyond the magnitude of the historical low-intensity fires. In the Front Range, we see pine forests gradually encroaching on grasslands, and Douglas firs (not fire tolerant) encroaching on ponderosa pine (fire tolerant) forests. Returning fire to these ecosystems will restore them to historic conditions.

To illustrate overcrowding, define a small enclosed area about 4 – 5 feet across (a hula hoop, a loop of string, or even a circle scuffed into the dirt). The circle represents the forest and all its resources. Ask 2-3 participants to step inside and become trees. Pull a cookie or graham cracker out of your pack, and divide it between them. The cookie shows the available resources. Ask your trees to stretch their arms out and show that they have plenty of room. This is a historical forest, maintained by regular burning.

Now jam as many people into your circle as will fit. Then explain about limiting resources (in this case, space). Is this a forest with happy trees? As people push and shove to get into the circle, point out that trees compete with each other in an analogous way. Then produce another cookie. The amount of resources hasn't changed, but the number of trees competing has. Share the cookie

equally between the people jammed into the circle. Each one gets a crumb, and may better understand the plight of our over-crowded forests.

**Burn Baby Burn:** Frequent natural fires “swept” the forest floor, burning up duff (dead leaves, downed needles, dead branches, etc). In the absence of regular burns, the duff layers of many Colorado forests have become very thick. The duff chokes out grasses, shrubs and wildflowers which would otherwise feed wildlife and provide biodiversity. Even worse, the duff becomes a highly-combustible time bomb awaiting a spark. Fire fighters call the accumulation of dead ready-to-burn stuff “fuel loading.” While a 10 or 20 year accumulation of duff might produce a low-intensity grass fire among the trees, an 80 year accumulation can produce an inferno that is much hotter. These fires can create hot high-intensity conditions outside the natural range our forests have adapted to. They are also very dangerous for fire fighters to control and can sweep into populated areas.

This game teaches how “fuel loading” creates fires that are beyond control. You’ll need a time keeper, a spray bottle makes a nice prop. You are the fire fighter.

Ask your group to imagine that each person represents 10 years of fuel loading. Once a person “catches on fire,” they have 5 seconds to tag another non-burning person, who then catches on fire. Left unchecked, the fire will rapidly spread through the whole group. You as the fire fighter have to squirt a burning person three times with your bottle (Spish! Spish! Spish!) to put them out, after which they can no longer tag anyone unless they catch on fire again. The time keeper counts out five second intervals (“One. Two. Three. Four. Five. One. Two. Three. Four. Five.”)

Start with a small level of fuel loading: one person catches on fire, waving their arms and saying “Crackle! Crackle! Crackle!” You should have no problem spraying them three times before they can tag anyone. Then try again, designating three people to burn (or 30 years of fuel loading). This time the fire will be able to spread much further before you can put it out, and you’ll find it a challenge to get every one. Finally, designate eight people to start burning, representing 80 years of fuel loading. You will be unable to put the fire out in time to prevent its spread.

**Back Burn:** To stop a fire, fire fighters often use a technique called “back burning.” They carefully burn out a small area in the path of an advancing fire, using up all the available fuel and creating a blackened fire break. When the main fire reaches the back burned area, it runs out of fuel and goes out. This can stop a wild fire, but also can help create boundaries for a prescribed burn.

Using a stick, scratch an area in the dirt that defines an area you want to protect from fire. It can represent a town or a house. Split your group of participants in half. One half of the group should go about 20 or 30 feet away and form a line, holding hands, perpendicular to and facing the town. They represent the advancing front of a wildfire. They can say, “Crackle! Crackle! Crackle!” and slowly advance on the town.

The other half of the group will become the back burn. They form a line between the town and the advancing flame front. When the fire fighters say “GO!” the line of back burners gradually advances toward the oncoming wild fire while moving away from the town. When the two lines meet, they both go out.