

# The Storrie Fire Story

This cartoon story about wildland fire has five chapters, so you may want to present it in 4-5 separate class periods. The narrative for the story is given, chapter by chapter, in the tables below. Narrative is in the left column. **The symbol “/” tells you to advance to the next graphic.** **Yellow highlighting** identifies points in the narrative where students could add a sound effect. Suggestions and resources for sound effects are listed in the right column. Have the students use the links to learn some animal sounds in preparation for Story Time, or use the links as you narrate the story. Feel free to ask for additional sound effects throughout the story! **Red ink** in the narrative indicates an opportunity to discuss something with the class. These are most common in Chapters 2-4.

The narrative contains many references to plants’ “buried treasures.” These are plant parts that live at the soil surface or within the soil and enable the plant to grow back after its aboveground parts are removed by fire, grazing, cutting, or other means. Buried treasures include root crowns, rhizomes, bulbs, and dormant seeds. They are illustrated in the PowerPoint presentation by pink patches at the bases of the plants.

If you’d like to shorten the time spent on the story, you can display the poster of characters (CharacterKey.pptx), then start the presentation with Chapter 2. You’d need to do an introduction that tells the students what each organism is and (for plants) any adaptations to fire and “buried treasures”. Alternatively, if the students have been studying and doing presentations on individual organisms (Activity E08), you can have them “present” the characters themselves. Every organism mentioned in the presentation is described in the FireWorks Encyclopedia. If you don’t want to delve into the history of the Storrie Fire itself (a wildland fire that burned 227 square kilometers in the summer and fall 2000), you shorten the storytelling by skipping Chapter 5.

## About the science in the story:

Because this story is intended for students at the primary and lower elementary levels, we have simplified the ecology to some extent. We have selected only about 30 species from the thousands that live in the ecosystem. For example, we treat two oak species (California black oak and canyon live oak) as if they were ecologically the same; we treat Douglas-fir and two true firs (white and red) as if they were ecologically the same. We describe only 3 species that occur in chaparral. And we leave out some very important fire-adapted trees, including Jeffrey pine and incense-cedar, just to keep things relatively simple.

The narrative gives a tiny amount of information on Native Americans’ use of fire. This is based on Anderson and Moratto’s (1996) synthesis of literature and traditional knowledge. It is beyond the scope of our project to describe the practices of specific Native American peoples. However, local educators may wish to obtain more local information on this topic and include it in the narrative.

The narrative contains several terms that may not be familiar to students. If necessary, pause to explain them. Here are some of the terms and brief definitions:

**Buried treasures:** the underground portion of a plant that has buds that can sprout if the aboveground portion is damaged or killed. Buried seed can also be a “buried treasure”.

- **Bulb-** an underground storage organ in a plant. A bulb has roots on its lower surface and fleshy leaves above. Perennial plants are able to reproduce from their bulbs.
- **Rhizome-** a creeping stem of a plant that grows in the duff or soil. Rhizomes contain buds, also called growing points, from which new plants can grow.
- **Root crown-** The point at which the root and stem of a plant meet. Some plants have buds at their root crown that can sprout if the top of the plant is damaged or killed.
- **Seed-** offspring of a plant. Each seed contains a tiny, living plant called an embryo and its protective covering, which is filled with nutrients. Seeds need just the right temperature, water, sunlight, and soil conditions before they can grow; some also need to be heated, cooled, or cracked open before they can grow.

**Crown fire-** fire that spreads in the crowns of trees and shrubs. Crown fires are usually ignited by surface fire. They are common in coniferous forests and chaparral-type shrublands.

**Dense forest-** a forest with many trees packed close together. These forests are hard to walk through because there are so many trees close together

**Forest floor-** the portion of the forest that is on the “ground”. It includes litter, duff, fallen branches, stumps, and small plants.

**Litter-** the top layer of the forest floor, not yet rotten. Litter includes freshly fallen leaves, needles, fine twigs, bark flakes, fruits, matted dead grass and other plant parts that are little altered by decomposition.

**Open forest-**forests that have widely-spaced trees. These forests are easy to walk through.

**Patchwork quilt-** plant communities do not often look uniform, rather they look patchy. Different patches may be due to different aged trees, different types of plants, or even due to fire. After fires, forests usually have patches with unburned forest, lightly burned forest, and severely burned forest. These differences can make a mountainside look like a patchwork quilt.

**Sapling-** a young tree

**Seedling-** a very young plant

**Sedge-** a grasslike plant that has triangular stems.

**Shrub-** a woody plant that is smaller than a tree and has several main stems arising at or near the ground.

**Sprout-** to put forth new growth on a plant; to grow a new plant from buds on an existing plant

**Surface fire-** fire that burns in the litter, duff, grasses, and wildflowers on the forest floor but does not burn in the crowns of trees. In FireWorks, we use the term to describe fires that do not kill the mature trees in a forest.

**Tree crown-** a tree's top, where most of the leaves and above-ground buds are found

# THE STORRIE FIRE STORY

This is the story of a beautiful place in the Sierra Nevada, the plants and animals that live there, and fire. / We'll explore a whole mountain side, from the Feather River Canyon all the way to the ridges high above. /

## CHAPTER 1. WHO'S AT HOME HERE?

Narrative	Info & sound suggestions
<p>Let's begin about 400 years ago. Here in the foothills above the river, / tall ponderosa pine trees grow far apart. / Lots of oak trees grow here too. Oak seedlings and saplings grow in the sunny openings. / Don't kick that pile of sticks at the base of the oak tree! It's a house built by this / dusky-footed woodrat. <b>She is busy eating oak leaves and acorns</b>, her favorite foods.</p> <p>/ Big patches of shrubs grow here too. The patches are called "chaparral." One of the shrubs in chaparral is deer brush. Its name tells you who comes to eat it- / <b>the mule deer</b>! In the afternoon, when the hillside gets too hot for comfort, / he rests in the shade of a pine tree.</p> <p>A long time ago, fires visited this mountainside often, so all of the shrubs and trees have ways to deal with fire. The ponderosa pines' thick bark and high crowns help them survive surface fires. Surface fires burn on the forest floor. Some of the oaks have thick bark, too. And all of the oaks can sprout from / buried treasures - their root crowns - after fire. That doesn't mean that the roots wear a crown, though! A root crown is the place right at the bottom of the stem, where the roots begin.</p> <p>/ Deer brush plants can sprout too, although not as well as oaks. They have another kind of buried treasure, too: / thousands of seeds stored in the soil. When a fire heats the soil, it cracks the seeds open so they can start to grow.</p> <p>The ground here is mostly covered with / grasses and wildflowers. / They have buried treasures too. These wavyleaf soap plants have bulbs growing deep underground. A hungry deer cannot get to the bulbs, and he wouldn't want to eat the leaves because they taste like soap!</p> <p>/ Do you hear the <b>northern goshawk scolding us</b> from the crown of that big ponderosa pine? He is upset because we are close to his nest! We had better leave him and go higher up the mountainside.</p>	<p><b>This first section is about the foothills, the lower 1/3 of the display.</b></p> <p>Crunching sounds</p> <p>Munching sounds</p> <p><b>First mention of buried treasures</b></p> <p>Goshawk calls:  <a href="https://www.audubon.org/field-guide/bird/northern-goshawk">https://www.audubon.org/field-guide/bird/northern-goshawk</a> (lower right)</p>
<p>As we go uphill, we find more / ponderosa pines and also a new kind of tree, the sugar pine. These trees have thick bark and hold their</p>	

branches high above the ground. That is how they survive surface fires. / There are oak trees here too - with their buried treasures. The oaks and pines are mixed with / fir trees. / There are patches of young pines and firs here too. Firs cannot sprout like oak trees do, and their bark is very thin when they are young, so surface fires can kill them easily. Old firs have thick bark that protects them from the heat of fires. But look at all the fir branches that grow down low, near the ground. Sometimes surface fires use these branches to climb up into the tree crowns.

/ I hear someone up in an oak tree, **stamping its foot and scolding us**. It must be the western gray squirrel, warning us to leave its acorns alone.

/ Here are some more patches of chaparral. These patches contain many kinds of shrubs. You already know about deer brush. The new one is and sticky whiteleaf manzanita. / **American black bears love to eat manzanita fruits, but they can't digest the seeds inside.** / The seeds come out in their droppings, so the bears are planting manzanitas while they put on fat for the winter! The seeds are manzanita's special buried treasures. They are covered by bear poop and dead plants while they wait for a fire to crack them open so they can grow.

/ Chaparral is the perfect habitat for the fox sparrow. **He's calling from a manzanita branch.** Then he'll **scratch in the dead leaves** on the ground for insects and seeds to eat.

In the sunny openings, we find patches of / bracken fern. The ground feels spongy underneath because of all the dead fern fronds lying on the ground. The soil here is thick with the fern's / buried treasures – its rhizomes. Those are tough underground stems that grow new fronds every spring. Other openings have / grass and wildflowers, including the mariposa lily. Its buried treasure is a bulb that grows deep in the soil.

You probably didn't see the tiny holes in the ground under the chaparral. These are doorways to a / deer mouse's burrow. She has just come out to see if it is dark yet. That's when she'll go looking for food.

Let's go to the top of the ridge, more than 1,000 meters above the river. A lake lies on the mountain side. It is surrounded by / grasses and Ross's sedge. Sedges are small, grass-like plants that have triangle-shaped stems. A small patch of Webber's milkvetch grows in a dry, rocky spot nearby. The milkvetch is a rare, very mysterious plant. No one knows yet how it responds to fire.

**This section is about the lower montane forest, the middle 1/3 of the display.**

Scolding: "CHA-CHA-CHA-CHA-CHA!" ... or...  
<http://content.lib.utah.edu/cdm/ref/collection/wss/id/1417>. (Find vocalizations under "Links to Media.")

Munching

Fox sparrow:  
<https://www.audubon.org/field-guide/bird/fox-sparrow>  
(lower right)

**This section is about the upper montane forest, the top 1/3 of the display.**

<p>/ A mule deer comes to the edge of the lake for a <b>drink of cold water</b>. He may graze on the grasses and sedges, but grazing won't hurt them. The plants will just grow new leaves from their / buried treasures – their root crowns and rhizomes. The deer will also eat the leaves of / mountain whitethorn and deer brush in the chaparral. / Whitethorn bushes have heavy, thick, woody buried treasures at the base of each stem. / Like deer brush and manzanita, they also store their seeds in the soil to wait for a fire.</p> <p>/ When it gets hot in the afternoon, the deer rests in the shade of these Sierra lodgepole pines and fir trees. He had better be careful. / The <b>mountain lion</b> back in the fir trees could pounce on him for dinner!</p> <p>Grown-up fir trees have thick bark, but lodgepole pines have thin bark and no buried treasures, so it is hard for them to survive fires. / There are many patches of small trees scattered on the hillside. If a fire burns a patch of firs and lodgepole pines, these may be grow up into a new patch of forest.</p> <p>/ This big fir tree holds the nest of a pair of <b>California spotted owls</b>. They rest during the day, but they will have a busy night. One of them must stay on the nest and keep the eggs warm while the other hunts for food. The deer mouse should be very careful when it hears the owl's call tonight.</p> <p>In this patch of rocky soil, we find some unusual trees - / Baker cypresses. They seal their cones up tight with wax and store them on their trunk and branches. The cones have to be heated up to let the seeds out. These are treasures, but they are NOT buried!</p> <p>/ All of these plants and animals – and hundreds of others – have lived together, here in the Sierra Nevada, for thousands of years. The Feather River Canyon and the mountainsides above it has provided just the right habitat for them.</p>	<p>Slurp</p> <p>Lion sounds: growling, roaring, and even shrieking</p> <p>Owl calls:  <a href="https://www.audubon.org/field-guide/bird/spotted-owl">https://www.audubon.org/field-guide/bird/spotted-owl</a>  (lower right).</p>
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## CHAPTER 2. SURFACE FIRES VISIT THE CANYON

Narrative	Info & sound suggestions
<p>In the last chapter, we met some of the plants and animals that live here on the mountainsides along the Feather River. / These species have lived here for thousands of years. Do you remember their names? (Spend a few moments reviewing. You can use the poster that shows all the characters.) / Now let's learn about the surface fires that used to visit the canyon.</p> <p>/ What are these pointy black marks on the trunks of the ponderosa pines? They were made by surface fires that burned the mountainside every few years in the past.</p> <p>/ Here comes a <b>surface fire</b> now! It started by the river and is spreading uphill. / The mule deer smells the fire and hears it with his big, twitchy ears. <b>He runs away</b> to browse in another patch of chaparral.</p> <p>/ The fire spreads through some patches of chaparral. It is bigger and <b>noisier in these dense shrubs</b>. / The woodrat's house burns. She is not worried though. She has many other houses to use. / She runs off to watch from another oak tree.</p> <p>/ The fire burns uphill. The black bear smells it and hears it coming. / <b>She lumbers off</b> to feed in a safer spot.</p> <p>/ The fire goes under some pines and spreads into patches of manzanita. / The deer mouse hides in her burrow. / The <b>gray squirrel scolds the fire loudly</b>, then runs and leaps from tree to tree and rests on a safe perch.</p> <p>/ The fire moves across the hillside, burning some patches and missing others. / The <b>fox sparrow</b> calls out a warning as he flies to a chaparral patch below the fire. / The wind changes, and the fire changes direction. / In a few places, it climbs up through the small trees and <b>torches the tree crowns</b>.</p> <p>/ The goshawk likes the fire. He is soaring above it, hunting for small animals as they run away.</p> <p>/ The fire stops when it gets to the shore of the lake.</p> <p>/ Then it gradually goes out. It leaves gray patches where the chaparral has burned. / It leaves patches of ash where the grasses and flowers grew. / It leaves black sticks in place of the oak saplings.</p>	<p><b>This fire stays in the foothills &amp; lower montane forest.</b></p> <p>Crinkle paper for surface fire sounds.</p> <p>Tap fingertips on desk.</p> <p>"Whooshing" sounds</p> <p>Thumping steps</p> <p>"CHA-CHA-CHA-CHA!"</p> <p><a href="https://www.audubon.org/field-guide/bird/fox-sparrow">https://www.audubon.org/field-guide/bird/fox-sparrow</a></p> <p>Louder fire sounds</p> <p><a href="https://www.audubon.org/field-guide/bird/northern-goshawk">https://www.audubon.org/field-guide/bird/northern-goshawk</a></p>

/ The flames continue to die out. / The bracken ferns have turned to ash. / A few of the big trees have burned – mostly firs. / Then the fire is over. What changes do we see? (Opportunity for discussion.) The fire burned through many patches of grass and chaparral, but it left many untouched. The fire killed some trees, but its short flames left many survivors. The mountainside is a quilt with lots of patches of black and gray and green.

What will the animals and plants do? (Opportunity for discussion.)

/ After a year goes by, many oak trees have sprouted from their root crowns. / The goshawk is protecting its nest again.

/ The woodrat is building a new house next to a sprouting oak tree.

/ The gray squirrel is burying acorns in the burn and warning everyone to stay away until he comes back for them next winter.

/ Grasses have sprouted. Soap plants and mariposa lilies have come up from their bulbs. They like all this sunshine, so they are producing lots of flowers. / Where the chaparral burned, we find sprouts and seedlings. / There are even small patches of manzanita growing from old bear droppings. / The fox sparrow is still singing and feeding in patches of shrubs that the fire skipped around. He will return to the burned patches when the shrubs are tall and thick enough to hide in.

/ Bracken ferns have sprouted from their rhizomes. They like the burn. Their patches are getting bigger. / The deer mouse still lives in a patch of chaparral. She has come out to see if it's dark yet and time to look for food. / The black bear and mule deer are coming back to eat the new plants in the burn.

After a few years, we can find / seedlings of ponderosa pine, sugar pine, and fir trees in the burn. They are growing well in all of this sunshine, and they love the nutrients in the ash-covered soil. / The mountain side looks a lot like it did before the fire. The plants and animals know how to live with fires like this – surface fires that visit every few years.

<https://www.audubon.org/field-guide/bird/northern-goshawk>

Scratching and “CHA-CHA-CHA!”

<https://www.audubon.org/field-guide/bird/fox-sparrow>

Thumping bear footsteps & finger-tapping deer steps

## CHAPTER 3. ROLLERCOASTER FIRES

Narrative	Info & sound suggestions
<p>In the last chapter, we learned about the surface fires that used to burn in the Feather River Canyon every few years. We saw what the animals did as fire came close. We saw how the plants responded. (Opportunity for review of species names and responses to fire.) Although these were surface fires, they sometimes burned into the tree crowns. Now let's learn more about fires that burn up and down, in all layers of the forest. / We'll call them rollercoaster fires.</p> <p>/ On a hot, sunny afternoon, storm clouds gather above the ridge and block out the sun. / With a blinding flash and a loud CRACK, lightning strikes a lodgepole pine near the lake. / Shards of hot wood fly from its trunk. A few sprinkles of rain fall. / Then the clouds move on over the mountains and the sunshine returns. / But something has changed: A fire has begun!</p> <p>What will the animals do? (Opportunity for discussion.) / The mule deer is startled by the lightning and the smell of fire. He clatters downhill. / The mountain lion follows. She is just as fast as the deer, but she makes no noise.</p> <p>/ The spotted owl wakes from her daytime rest, hoots once, and flies off to roost in a big sugar pine.</p> <p>/ The bear wanders downhill to feed.</p> <p>/ The fire burns through patches of dry sedge and grass. It burns through some of the chaparral.</p> <p>/ Then the wind comes up and blows hard. The fire moves faster. It torches some of the saplings and some of the big trees. It sounds like trucks on a busy highway.</p> <p>/ The fire is going at top speed when it reaches the Baker cypresses. It jumps into their low branches and then into their tops. It is a crown fire! It sounds like a freight train as it spreads from crown to crown through the cypresses. / Then it reaches the other side and drops out of the tree crowns, down to the forest floor. / The wind dies down. When the fire reaches the ridge and runs out of fuel, it stops.</p> <p>/ The fire leaves patches of ash where the grasses and flowers grew. / It leaves gray patches where the chaparral has burned. / Some of the saplings and a few big trees have burned. / The flames</p>	<p><b>This fire is in the upper montane forest.</b></p> <p>Lots of possibilities for sound here.</p> <p>Crinkle paper for fire.</p> <p>Clatter/fingertips on desk.</p> <p><a href="https://www.audubon.org/field-guide/bird/spotted-owl">https://www.audubon.org/field-guide/bird/spotted-owl</a></p> <p>Thumping bear walk</p> <p>Crinkling again, then "Whooshing" sounds</p> <p>Wind sounds</p> <p>Big trucks rolling</p> <p>Freight train</p> <p>Crinkle again</p>

in the Baker cypress grove die out, leaving more black snags. / These dead trees are perfect habitat for black fire beetles and the **black-backed woodpecker**. / The beetles burrow through the bark of the dead trees. The woodpecker's black feathers hide it so well that it seems to disappear.

What changes do we see? **(Opportunity for discussion.)** The fire burned through many patches of grass and chaparral, but it left others untouched. The fire killed the small trees in its path, but other patches survived. Even the lightning-struck tree still lives, but it will have a long, jagged scar on its trunk for the rest of its life. Once again, the mountainside looks a like a patchwork quilt of black and gray and green. What will the plants and animals do? **(Opportunity for discussion.)**

/ The grasses, sedges, and shrubs sprout from their buried treasures. / A few patches of chaparral begin to grow from seeds that were cracked open by the fire. / **The black bear and mule deer return.** / The lion is stalking another deer, down near the river.

/ Some pine and fir seeds floated from living trees into the burned patches. The seedlings love the sunshine and the warm, black soil. / The Baker cypress grove looks completely dead, unless you look at the ground. The crown fire melted the wax covering the cypress cones and let the seeds out! Now the ground is covered with baby cypress trees.

The mountainside changes from year to year and from fire to fire, and yet the plants and animals know how to live here. They run or hide or sprout or grow from seed. They all know how to live with rollercoaster fires as well as surface fires.

<https://www.audubon.org/field-guide/bird/black-backed-woodpecker> (lower right)

Thumping & tapping

## CHAPTER 4. CHANGING TIMES

Narrative	Info & sound suggestions
<p>For hundreds of years, fires visited the Feather River Canyon every 15 years or so. Lightning started some of the fires. Native people used fires to do things for them. What kinds of things?  <b>(Opportunity for discussion.)</b> They used fires to make sure there would be fresh berries every summer and good acorn crops every fall. They used fires to make sure they would have sprouting plants for baskets and ropes. They used fires to clear out patches of brush and tree seedlings.</p> <p>/ Most of those fires were surface fires. They burned in patches, but they didn't burn across the whole mountainside. / In a few years, the burned patches would be covered with sprouts and seedlings. / Once in awhile, in a place where the trees grew close together, the fires burned into the treetops and raced from one tree to another. When the flames reached a more open forest, they dropped to the ground and became surface fires again.</p> <p>/ Plants and animals and native people lived well here for thousands of years.</p> <p>/ Then things began to change. Miners and other settlers came. They cut trees to hold up their mines, to build railroads and towns, and to heat their homes. The native people were not able to manage their land with fire any more. Then people decided, about a hundred years ago, that they didn't want fires at all. They put out every fire that they could. This changed the mountainside.</p> <p>/ Without fire, some of the oak trees decayed and died. There were not as many oak sprouts or seedlings anymore. / In the foothills, the patches of chaparral grew bigger and taller.</p> <p>/ The fir trees produced more and more seedlings, and these grew into tall trees. In some places, the young trees were so thick you could hardly see past your nose! Some patches of chaparral died in the shade of the fir trees. Thickets of firs replaced them. / Seedlings of ponderosa pine and sugar pine started to grow too, but they did not like this shade. Most of them were spindly and weak.</p> <p>/ Trees shaded some of the grasses and wildflowers, so the soap plants and mariposa lilies did not produce flowers. / Higher on the mountainside, the forest became thick with fir trees. The lodgepole pines began to die out.</p>	<p><b>The first few slides in this chapter are review.</b></p>

/ The Baker cypress seedlings grew into tall, old trees. But without fire, their seeds were trapped in their cones, so there were no cypress seedlings at all.

What did these changes do to the mountainside? (Opportunity for observation and discussion.) The mountainside used to be a patchwork quilt, a mixture of trees, shrubs, grasses, and wildflowers. Now it was mostly forest, and the forests up high on the hillside were thick with trees of all sizes.

The habitat for animals changed too. / The goshawks and spotted owls loved nesting in the dense forest, but they had to search far and wide for open patches to hunt in.

/ The fox sparrow went away, looking for younger patches of chaparral to nest in.

/ The gray squirrel and the woodrat liked having lots of trees, but they missed some of the sunny openings that provided more seeds and acorns. / The deer mouse stayed in the forest but didn't produce as many babies as she had before.

/ Some of the deer and black bears stuck around, but many took off in search of open forests and meadows. / With fewer deer, there were also fewer mountain lions.

What do you think would happen to the plants and animals here if a fire started now? (Opportunity for discussion)

<https://www.audubon.org/field-guide/bird/northern-goshawk>

and

<https://www.audubon.org/field-guide/bird/spotted-owl>

<https://www.audubon.org/field-guide/bird/fox-sparrow>

CHA-CHA-CHA!

Thumping & finger tapping

## CHAPTER 5. THE STORRIE FIRE

Narrative	Info & sound suggestions
<p>On August 17, 2000, the people living in the Feather River Canyon learned that a fire had started just above the river. / They called it the Storrie Fire because it started on the railroad tracks near a town called “Storrie.”</p> <p>The weather was hot and dry. The litter on the forest floor was dry. The logs were dry. Grasses and wildflowers had been moist and green in the spring, but now they were dry too. As you walked under the trees, everything on the ground sounded crisp and crinkly underfoot. Did the fire like all this dry fuel? (Opportunity for discussion.)</p> <p>/ The Storrie Fire began as a surface fire. People tried to put it out, but it was spreading too fast through grasses and shrubs. / The fire raced uphill, sounding like trucks on a big highway. It scorched the needles of the big pines. Big, thick patches of old chaparral exploded with heat. / The fire burned to the tops of the oak trees. It was so hot that it cooked some of their roots and root crowns – their buried treasures.</p> <p>/ The fire spread fast through the dry grass. Thickets of fir trees went up in flames. / The deer ran down across the river to get away.</p> <p>/ Burning branches rolled downhill and started more fires in the chaparral and grass. / The squirrel scolded and ran off, looking for safety. / The woodrat ran for her life. She had built her house in a tree so it would be safe from surface fires. But this fire was too hot. / It torched the tree, and the house burned up. / The deer mouse ran into the deepest tunnel in her burrow and waited as the fire roared outside.</p> <p>But not every animal hid underground or tried to escape. Guess who wanted to stay! (Opportunity for discussion) / The northern goshawk came back to hunt. Other predators and scavengers came too.</p>	<p><b>Once the class starts making the sounds for fire and heavy rain, it will be too loud for them to hear your instructions. Prepare them by telling them they must imitate what you do: You will hold your hands in front of you to indicate all noise should stop, and you will show them how loud or quiet to be by moving your hands wide apart or close together.</b></p> <p>Crinkle paper</p> <p>Tapping, clattering, splashing</p> <p>CHA-CHA-CHA!</p> <p><a href="https://www.audubon.org/field-guide/bird/northern-goshawk">https://www.audubon.org/field-guide/bird/northern-goshawk</a></p>

/ Flames spread into the thickets of young fir trees and scorched more pine trees. The burning firs made showers of sparks. / The fire burned off the tops of the grasses and wildflowers and ferns. The fire climbed up into the crowns of the big ponderosa pines and sugar pines. **Some of them exploded.** / Black fire beetles moved in while the tree trunks and branches were still glowing hot. Thousands of them landed on the burned trees. / They tunneled through the bark to feed and lay their eggs.

Firefighters came, but they could not stop it.

/ **The wind blew stronger and stronger.** The fire spread into the big firs, **roaring like a freight train.** Flaming branches shot up into the sky. / The wind carried them ahead of the fire, where they started new fires. / The fire climbed into the crowns of the lodgepole pines. It was burning from crown to crown. It sounded like a **hundred jet planes taking off at once.**

Helicopters brought more firefighters, but they could not stop it. Airplanes dropped water and chemicals on the fire, but they could not stop it.

/The wind changed. / It pushed the fire in different directions. The fire burned across the mountainside. It missed the Baker cypresses, / but a few years later they burned too.

/ Finally the **wind quieted down** and the clouds came. Then there was rain. / First there a few **little drops.**

Then the drops came **thick and fast.**

Then **sheets of rain fell.**

It was **beating on the ground.** You could hardly see through it.

Streams of **water swooshed down the hillsides** and filled the gullies. Water filled the dry creek beds and rushed down to the river.

/ Then rain **slowed down a little.**

Then it became a **gentle shower.**

Then it was just a sprinkle.

Then it stopped. / The fire went out. It was quiet.

But not completely quiet. If you listened closely, you could hear the **beetles feeding** under the bark of the dead trees.

/ Woodpeckers arrived to eat the fire beetles and their larvae. The forest became noisy with their drumming and calls.

More wind sounds

Tap fingers lightly on desk  
Snap fingers  
Swish palms together  
Slap hands on thighs, stamp feet  
Add sloshing sounds

Stop feet. Stop slapping.  
Swish palms, snap fingers.  
Tap fingers lightly on desk.

Very quiet crunching

<https://www.audubon.org/field-guide/bird/black-backed-woodpecker>

/ A year after the fire, most of the scorched trees had died. / But grasses and sedges and wildflowers were sprouting and coming up from seeds that the fire opened. The soap plants and mariposa lilies produced lots of flowers. / Bracken ferns sprouted like crazy.

/ Deer mice found lots of fresh leaves and seeds to eat, so they made even more burrows underground and had more babies than ever. / Deer brush, manzanita, whitethorn, and other shrubs were sprouting and growing from seed. Instead of forest covering the mountainside, there were huge patches of chaparral and grass.

/ **Deer returned to eat** along the edges of the burn. They were afraid to go far into the big, open areas, away from the cover of trees. / The mountain lion was not afraid of the open burned area, but she stayed near the deer along the edge.

/ The **black bear wandered** through to feed on fresh berries and the seeds of young shrubs.

/ Some of the big oak trees survived the fire. Others sprouted new stems from their buried treasures. / The woodrat and the **gray squirrel** came back to hunt for acorns, berries, and seeds.

/ The goshawk and spotted owls still nested in places with big, old trees, but **they hunted in the burn** – the goshawk during the day, the owls at night.

The people were sad after the Storrie fire. They missed their old forest and worried that winter rains would wash more soil away. They wanted to help the land, so they planted trees. They pulled weeds. They put up barriers to hold the soil in place. They fixed roads and trails.

Now many years have gone by. / The fire beetles and black-backed woodpeckers have moved to other burns.

/ **Fox sparrows have come back to sing and scratch** for insects in the young chaparral. / The oaks that sprouted after the fire have grown tall, and many of them are still sprouting!

/ Pine and fir seedlings are growing on the mountainside now. People planted some of these. Others grew from seed that fell from trees that survived the fire. Someday they may be big enough to hold nests for the goshawks and owls again.

/ The woodrat has built two houses up in the oak trees. / The ferns love the sunlight here, so they have spread far and wide.

Tapping and crunching

Thumping and munching

CHA-CHA-CHA!

<https://www.audubon.org/field-guide/bird/northern-goshawk>

<https://www.audubon.org/field-guide/bird/black-backed-woodpecker>

<https://www.audubon.org/field-guide/bird/fox-sparrow>

/ The ground under the burned cypresses is carpeted with seedlings. In 50 years or so, there will be a new stand of big cypresses here, just like the old ones.

The people do not have their old forest back, but the area burned by the Storrie Fire is alive with healthy plants and animals. I hope you can visit sometime and see it for yourself.