

# Mammoth Grove Hotel

J. L. SPERRY, Manager.



*Big Trees, Calaveras Co., Cal., ..... 18\_\_*

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*See activity on page 53.*

*(For activity directions, see page 56.)*

## BIG TREES TOWN HALL MEETING GROUP INFORMATION CARDS

### **LOGGER**

Logging is more than just a job for you... it's a way of life. Your father was a logger and it's the only way you have to support your family. You believe that trees should be used by people, not just left alone. You want to make sure that you will always have trees to cut, so you work for a company that replants seedling trees in areas that are logged. Trees are a renewable resource. You cut them down, but you can always grow more. You want to log part of the North Grove of Big Trees at Calaveras.

### **SPECULATOR**

You are a person who is always coming up with ideas for making money... LOTS of money. You think it's a great idea to cut down a tree or strip it of its bark if there's a profit to be made. You own and operate a business in the North Grove, and like being able to make money from a tourist attraction like the Big Trees of Calaveras. You believe that nature is ours to use, especially if there is money to be made. What's wrong with cutting down a few trees as long as we leave the rest? It's a free country, and you should be able to do as you want.

## **PRESERVATIONIST**

You believe that the Big Trees of Calaveras should be protected from any kind of cutting, bark stripping, or damage. You think it is amazing that these trees are able to grow so big and live so long. You want to preserve them so that all people can enjoy them, including the future generations. You see them as an irreplaceable and rare treasure, and know that if they are not protected, these trees will soon be destroyed.

## **TOURIST**

You have heard many amazing things about the newly discovered Sierra redwoods, and traveled many miles just to see the trees. You think the trees are truly amazing and beyond description. You are very glad to have been able to see them. You are concerned about some of the things you saw, like the huge tree that was cut down, and the tree with its bark stripped. You hope that no more of these magnificent trees are killed, because you want to know that they will always be there to visit.

(See activity  
on page 53.)

## BIG TREES DISCOVERED! —A PLAY

**Directions:** Choose students to play the different characters in the story. As the story is read to the class, each character makes a sound, motion, or says something when you mention their name (in **bold letters**). Characters and suggested noises and motions are listed below. Props you may wish to use are also listed.

### CHARACTERS:

**Augustus T. Dowd** (or "A.T.") ..... "Oh wow!"  
*Looks up slowly, as if at a huge tree. Wears cowboy hat.*

**Bear** (grizzly bear): ..... "GRRRRRRRRRR!"  
*Use teddy bear, or bear puppet.*

**Tree** ..... "Swish, swish!"  
*Wave arms like branches.*

**Miners** (2 or more students) ..... "Thar's gold in them thar hills!"

**Friends** (2 or more students) ..... "Yeah... sure."

**Horse** (or horseback) ..... "Neigh!"  
*Clap hands on knees like the sound of a horse galloping.*

**Shot** ..... *Pop a paper bag.*

### Wild Animals

(the remainder of the students) ..... *Wild animal sounds.*

Once upon a time, about 130 years ago, lived a man named **A.T. Dowd**. He lived in a gold mining town called Murphys in the foothills of the Sierra Nevada. At that time, the country was wild and rugged, filled with **wild animals**, wild men, and even **grizzly bears**. The men were **miners**, madly driven in their search for gold. **A.T. Dowd** was not a **miner**. He was a backwoods hunter, hired by the Union Water Company to hunt **wild animals** to feed their employees. He once killed a **grizzly bear** with only his bare hands and a hunting knife, losing only three fingers in the process.

One day when he was out hunting, he happened across a huge **grizzly bear**. He aimed his rifle and **shot**, but only wounded the **bear**. The **bear** began to run, with Dowd following closely on **horseback**. Suddenly, our hero **Dowd** was stopped dead in his tracks. There before him stood the, most inconcievably humongous monster of a **tree** he had ever seen in his life. He let the **bear** escape, and spent the rest of the day exploring this forest of mammoth **trees**.

He was so excited about his discovery, that he went back to Murphys that night and told his **friends** about what he had seen. But since good old "A.T." was known to be a great storyteller, they only laughed at the great story he had made up. **Dowd** vowed to go

back to the grove and measure one of the **trees** with a string so his **friends** would believe him. The next week he did, and after measuring the string found it to be over 100 feet long. But still his **friends** were not convinced. As they pointed out, he could have circled the string around a log cabin instead of a **tree**.

Finally, he convinced a group of his **friends** to take the 20-mile journey up to see his **trees**. After a full day's journey on **horseback**, and almost missing the grove completely, they found the **trees**... now known as the North Grove at Calaveras Big **Trees** State Park. From that day on, the news about the giant **trees** spread throughout the country and the world, and "**A.T.'s**" Big **Trees** became very famous.

And that is the story of how **A.T. Dowd** discovered the world's largest living things, the Big **Trees** of Calaveras, despite his **friends**, the **miners**, the **bears**, and the **wild animals**.

*The End*

*A note to the teacher:* This is a true story. The tree Dowd discovered, once the largest in the North Grove is now the Big Stump, located at the North Grove trailhead. For more information about the history of the North Grove, read pages 49-52.



## SECTION B: AT THE PARK: SUGGESTED ACTIVITIES

### Suggested Activities

#### Activity Pages:

Visitor Center Treasure Hunt

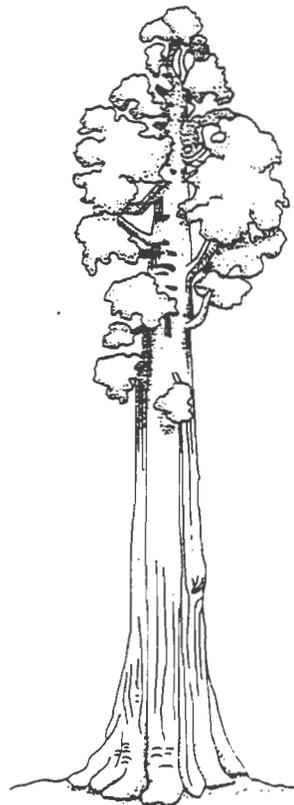
Animal Observation

Scavenger Hunt

*I turn to the Great Spirit's  
book which is the whole  
of creation. You can read  
a big part of that book  
if you study nature.*

*The great Spirit has  
provided you and me  
with an opportunity  
for study in nature's  
university, the forests,  
the rivers, the mountains,  
and the animals,  
which include us.*

—Tatanga Mani  
a Stoney Indian







## At the Park: Suggested Activities

Since your class will probably only have a few hours to spend at the park, the following suggestions are provided to help you make the most of your trip. Some activities require advance preparation, and some may be used as pre- or post-visit activities as well. See the introduction for more information about the Visitor Center, North Grove Trail, Three Senses Trail, waiving entrance fees, and making arrangements for a guided walk.

### **General Park Topics**

#### **North Grove Trail**

You can read the self-guiding brochure as you walk the trail, which will give your class information about the natural and human history of the grove. A fun way to do this is to play "Jr. Naturalist" with your class. There is a short paragraph written for each of the 25 numbered stops on the trail. Let one student or pair of students go ahead of the group at each stop (accompanied by an adult). They read the paragraph to the group at the stop, and then explain, or interpret, what they think it means. It can also be their job to find something else of interest to show the group when they arrive, or ask the group a question that they must answer. Older students can research a topic before coming to the park, and make a short presentation at an appropriate spot on the trail. North Grove Trail Guides are available at the trailhead, Visitor Center, and entrance station. Allow 1 to 2 hours for your hike.

### **Student Map of the North Grove Trail**

Make an enlarged copy of the map of the North Grove Trail from the Trail Guide for each student. When your students are on their hike through the North Grove, they can draw pictures or record information and impressions at each numbered stop along the way. This will be a lasting memento of your trip to the park, and provide material for discussion back at school. Call or visit the park to obtain a North Grove Trail Guide.

### **Visitor Center**

There is a lot to do and see in the Visitor Center. Spend time looking at and touching the museum exhibits. Watch the 20-minute introductory slide show. If pre-arranged, you can view a wildlife film. Talk to the docents. Do the Visitor Center Treasure Hunt on pages 74-77. One class (25 students) at a time, please. During the winter months, call at least 15 days ahead to arrange for the Center to be open for your group. Allow 20 to 45 minutes.

### **Trivia Game**

This requires a small amount of pre-trip preparation. In class, give each student a 3" x 5" index card. On the card, have them write down a question they have about Sierra redwoods or the park in general. Make sure all the questions are different. At the park, they need to find the answer to their question and record it on their card. When you get back to school, you can play "Trivial Pursuit: The Redwood Edition" in teams or small groups.

### **Journals**

This can be a lasting memento of your trip to the park. Journals can include any activities you do to prepare for your trip, or can be used only at the park. You may want to include:

- ▲ A place to record animal observations
- ▲ A space for bark rubbings
- ▲ The Visitor Center Treasure Hunt
- ▲ The Scavenger Hunt page
- ▲ A place for a sketch or poem
- ▲ Pictures of cones and leaves for tree identification



Sierra redwood cone.

## **Sierra Redwood Characteristics**

### **Rubbings**

Using the flat side of a crayon on paper, make rubbings of Sierra redwood bark, cones, and foliage. Try this on other types of trees as well. The first stop on the North Grove Trail has a platform that will allow you to get close enough to a Sierra redwood to do a bark rubbing.

### **Meet-A-Tree**

Children love this activity. Organize the students into pairs. One student in each pair is blindfolded, and the other is the leader. The leader guides the blindfolded student to a tree. The blindfolded student tries to find out as much as possible about the tree using the sense of touch, smell, and hearing. After 5 minutes or so, have all the students come together. Remove the blindfolds, and those students try to find the tree they have just met. Repeat the activity with the other partners. You can use this with "Adopt-A-Tree" from page 12.

### **Circle-A-Tree**

When the students are standing on the Big Stump at the start of the North Grove Trail, have the class stand in a circle, with each student standing near the edge of the stump. When you return to school, recreate the circle to compare the size of the tree to your classroom. If you have a guide with your group, they may be able to take you to a living redwood that your class can "hug."

### **How Old Is the Stump?**

This activity can help give the students some perspective of the age of the stump. When you're standing on the Big Stump, ask the students to guess how big the tree would have been at a given date. The tree was cut down in 1853, and was 1,244 years old, so it started growing in the year 609. How big would it have been:

- ▲ When Columbus discovered the New World in 1492?
- ▲ At the birth of our country in 1776?
- ▲ At the height of the gold rush in 1849?
- ▲ When the Miwok Indians first lived in this area 10,000 years ago?

## North Grove

While you are on your hike, closely observe the Sierra redwoods, especially noticing their characteristics:

- ▲ Soft, fibrous bark
- ▲ Egg-shaped cones
- ▲ Tiny seeds that resemble a flake of oatmeal
- ▲ Juniper-like foliage
- ▲ Wide bases
- ▲ Huge branches and rounded tops of the older trees

Look at the spreading root system on the fallen trees, and the pyramid shape of young redwoods. Where the trail and fences allow, use sight, sound, smell, and touch to experience the grove.

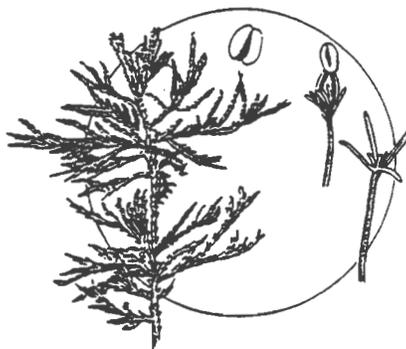
## Park Exhibits

The Visitor Center and North Grove exhibits, the introductory slide show, and the North Grove Trail Guide contain lots of information about Sierra redwood characteristics.

## Distribution and Geologic History

## Park Exhibits

The Visitor Center and North Grove exhibits and the introductory slide show contain information about Sierra redwood distribution and geologic history.



Sierra redwood seedlings.

## Sierra Redwood Growth and Reproduction

## North Grove

While on your hike, look for Sierra redwood cones, seeds, seedlings, and young trees. Count the seeds from a Sierra redwood cone. Watch a chickaree, and see if you can find one eating a redwood cone. Look for evidence of fire. Compare the tops of young and old Sierra redwoods.

## Park Exhibits

The Visitor Center and North Grove exhibits, the introductory slide show, and the North Grove Trail Guide contain information about Sierra redwood growth and reproduction.

## Forest Community

### Tree Finder

Make the tree finder on pages 46-47, and use it to find the members of the Sierra mixed-conifer forest community. Try using the tree finders as a group first. Then each pair of students can be responsible for finding one type of tree using the wheel and introducing that tree to the group. Have students examine closely and touch the bark, cones, and needles.

### Animal Observations



Find a place where students can sit quietly in their own spot and observe an animal. After watching that animal for a few minutes they can draw a sketch and record the type of animal, where it was, what it was doing, and any sounds it made. Ask them to try to figure out what the animal eats, where its home is, and its means of protection from predators. You can use the Animal Observation Page on page 78. Students can research their animal in more depth back at school.

### Tree Silhouettes (Sharing Nature With Children)

Students shape their body to resemble a certain tree or type of tree. Try acting out all the members of the Sierra mixed-conifer forest community. Try also with a group of students acting out one tree.

### Micro-Hike (Sharing Nature With Children)

This is a hike in miniature, guided by a string 3 or 4 feet long. Students place their string in an area of interest to them, and with magnifying glass in hand, "hike" their string 1 inch at a time, with eyes no higher than 1 foot above the ground. Have them share the natural wonders of their mini-forest with another student.



**Scavenger Hunt**

Use the one on page 79, or make up your own. Please do not collect any objects (except litter!), but share, discuss, and/or record what is found before returning it to its spot. This can be done at any point along the North Grove Trail. Please stay on the trail during this activity.

**Steal the Bacon**

Your students will learn their cones and leaves quickly with this game. Play like steal the bacon, but instead of an eraser in the middle, place five to 10 objects such as cones, leaves, or needles. To play, divide the class into two teams, which face each other with the objects in the middle. Give each student a number—there should be a student on each team with the same number. Call out the name of an object, then a number. Whichever student picks up the correct object first wins a point for their team. If they pick up the wrong object, their team loses a point.

**Human History of the Sierra Redwoods  
at Calaveras Big Trees**

**Historical Park Map**

Using the historical map of the area near the Big Stump on page 81, try to find the locations of buildings, roads, and trees that were there in the late 1800s.

**Dowd's Discovery**

A few students or teachers can reenact the discovery of the "Big Trees" when you first enter the grove.

**Dance on the  
Stump**

The stump was planed smooth in 1853 to serve as a dance floor. It was said in the 1800s that 32 people could dance a cotillion on the stump. If your students don't know a cotillion, try something else. Be careful as there are no railings around the edge.

**Litter Getter Club**

The Visitor Center must be open for this activity. Visitors to the park can earn a patch for picking up a bag of litter in the park. Bring your bag of litter to the Visitor Center and ask a docent for a patch for your class. (Sorry: we don't have enough for each student).

**Park Exhibits**

The Visitor Center and North Grove exhibits, the introductory slide show, and the North Grove Trail Guide all contain information about the human history at Calaveras Big Trees.



## Sensory Activities

### Three Senses Trail

This short trail begins near the North Grove trailhead. Trail directions are written in Braille and large print. Bring blindfolds or have your students close their eyes. They can hold onto the rope and listen to your directions or their partner's. During or after, you can discuss the sensations the students experienced, what it would be like to live without sight, and the ways nocturnal animals sense their surroundings. Allow 20 minutes for the walk.

### Theme Hikes

Try looking for objects related to a theme during your hike. Please do not collect any objects, but record by drawing or writing, or sharing verbally. Ideas for themes are:

- ▲ Animal signs
- ▲ Shapes
- ▲ Colors
- ▲ Textures
- ▲ Sounds
- ▲ Patterns
- ▲ Objects smaller than a penny
- ▲ Objects starting with each letter of the alphabet

### Blindfold Walk

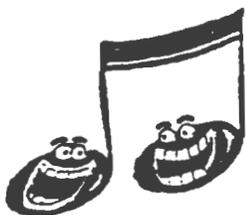
Walk part of the trail with one person in each pair of students blindfolded. Prepare the leaders to watch out for low branches, tree roots, and other obstacles. Ask them to focus on using their senses of smell, hearing, and touch. What happens when you go from shade to sunshine? How did they feel about trusting their partner? After 10 minutes or so, switch, and let the leader be blindfolded. Try this a different way: don't use a blindfold, but have the student look up at the forest canopy as they walk. What kinds of things did they notice? Are there different things happening 200 feet in the air?

## Sound Map

Students sit by themselves and focus on listening to sounds. Have them count the number of sounds they hear in 30 seconds. Then have them draw themselves in the center of a piece of paper along with a few landmarks. They draw any sounds that they hear onto their map. Discuss afterwards:

- ▲ What types of sounds did they hear?
- ▲ Animals?
- ▲ Wind or water?
- ▲ People?
- ▲ Trees growing?
- ▲ Cars?
- ▲ Could they hear more sounds with their eyes open or closed?

## Forest Orchestra



Spend a few minutes listening closely to forest sounds. Each student chooses one sound and practices making that sound. Organize your class into an orchestra, with the high pitched sound-makers on one side, and the growls and deep sounds on the other. Let everyone "tune up," then direct your forest orchestra.

## Poetry

### Nature Poems

Before your trip to the park, introduce your students to different forms of poetry such as haiku, cinquain, rhyming, or free verse. Bring cardboard, paper, and pencils on your hike. At some point during the hike, have your students find a quiet place to sit and imagine themselves as:

- ▲ A 2,000-year-old tree
- ▲ A chickaree
- ▲ A bat flying through the forest at dusk
- ▲ A tiny Sierra redwood seed pushing up through the soil
- ▲ Any animal or plant they have seen at the park

After 5 or 10 minutes, the students write a poem from the point of view of their plant or animal. Students share their poems when they return to school.

### Group Poetry

Something fun to try is a group poem. Each student contributes one word or short phrase about a chosen topic. The words and phrases are then arranged into a poem by you or a group of students. You can come up with some beautiful and hilarious results.

## **Art**

### **Sketching**

Take cardboard, paper, and pencils on your hike. There are many spots along the North Grove trail where your group can spread out and sit down to draw. Have the students focus on drawing exactly what they see. Have them try panoramic scenes or close-up detailed drawings.

### **Photography**

Take photographs at each stop on the trail and assemble the results into a North Grove Trail book back at school, with a sentence written about each photograph. Try panoramas and close-up shots.

## **Snow**

### **Snow Activities**

You may encounter snow on your trip. If you do, here are some fun things to do:

- ▲ Look at the different types of snow crystals.
- ▲ Look for animal tracks in the snow.
- ▲ Have a snow sculpture contest.
- ▲ Make snow angels.
- ▲ Take a measured amount of snow back to school to melt and see how much water it contains.

If you plan ahead, you can request a guided ski or showshoe tour for your group, but you will need to provide your own equipment.



# Visitor Center Treasure Hunt

Spend some time looking around the Visitor Center. See how many of these questions you can answer. Have fun!

1. One new thing I learned from watching the **slide show** is:

\_\_\_\_\_

2. Pick up and look at the **animal tracks**. Draw one of the tracks here:



Write the name of the animal here: \_\_\_\_\_

How many toes does it have? \_\_\_\_\_

3. Find the **What Is It?** boxes. Without peeking, put your hand in one of the boxes. Describe what you felt: \_\_\_\_\_

Now look inside. What was in the box? \_\_\_\_\_

4. Look at the **animals** all around the Visitor Center. Choose one you really like. (Don't worry, we didn't kill them. We found them after they had already died.) What is your animal's name? \_\_\_\_\_

What do you like about it? \_\_\_\_\_

Look at your animal closely.

What do you think it used to eat? \_\_\_\_\_

How do you think it protected itself from predators? \_\_\_\_\_

\_\_\_\_\_

5. Find the glass case that has the title: **The Giant Survivors**. Look at the display and read the words.

Who are the giant survivors? \_\_\_\_\_

Why are they called giant survivors? \_\_\_\_\_

What is the oldest recorded age of a Sierra redwood tree? \_\_\_\_\_

What type of tree in the park has the largest cone? \_\_\_\_\_

6. Find the **mortar and pestle**. Try grinding some corn. The Miwok Indians didn't grow or eat corn. What did they grind with the mortar and pestle?

\_\_\_\_\_

7. Find the **pump drill**. See if you can drill a hole in the wood. What did the Miwok Indians drill holes in? \_\_\_\_\_

8. Find the glass case with the title: **Big Trees Discovered!** Look at the pictures and read the words. See if you can find out:

When Calaveras Big Trees became a State Park: \_\_\_\_\_

Who discovered the Big Trees? \_\_\_\_\_

When? \_\_\_\_\_

9. Find the glass case with the **Miwok Indian** objects inside. Choose one object in the case and draw it here:



How do you think this object was used? \_\_\_\_\_

\_\_\_\_\_

10. So far, what is **your favorite thing** in the Visitor Center? \_\_\_\_\_  
\_\_\_\_\_

11. Find the **map of the park** with the lights on it. Push the button that says **Visitor Center**. Now push the button that says **North Grove Trail**. Find the **South Grove Trail**.

Which is bigger, the North or South Grove? \_\_\_\_\_

Which grove is closest to you right now? \_\_\_\_\_

What river do you have to cross to get from here to the South Grove?  
\_\_\_\_\_

12. Find the display of **rocks and minerals**. Choose one rock or mineral that you like. Look at it up close with the hand lens. Describe its color and texture here: \_\_\_\_\_

Look up at the chart above the rocks.

Write the name of your rock here: \_\_\_\_\_

And one fact about it here: \_\_\_\_\_

13. Find the **quiz board**. Take turns quizzing a friend. Write down two facts that you learned from the quiz board:

1. \_\_\_\_\_

2. \_\_\_\_\_

14. Find one of the **docents** who volunteers in the Visitor Center (they wear green vests). Write his or her name here: \_\_\_\_\_

Think of a question you would like to ask him or her. (It can be one of the ones you're supposed to answer). Write the question and the answer here:

Question: \_\_\_\_\_

\_\_\_\_\_?

Answer: \_\_\_\_\_

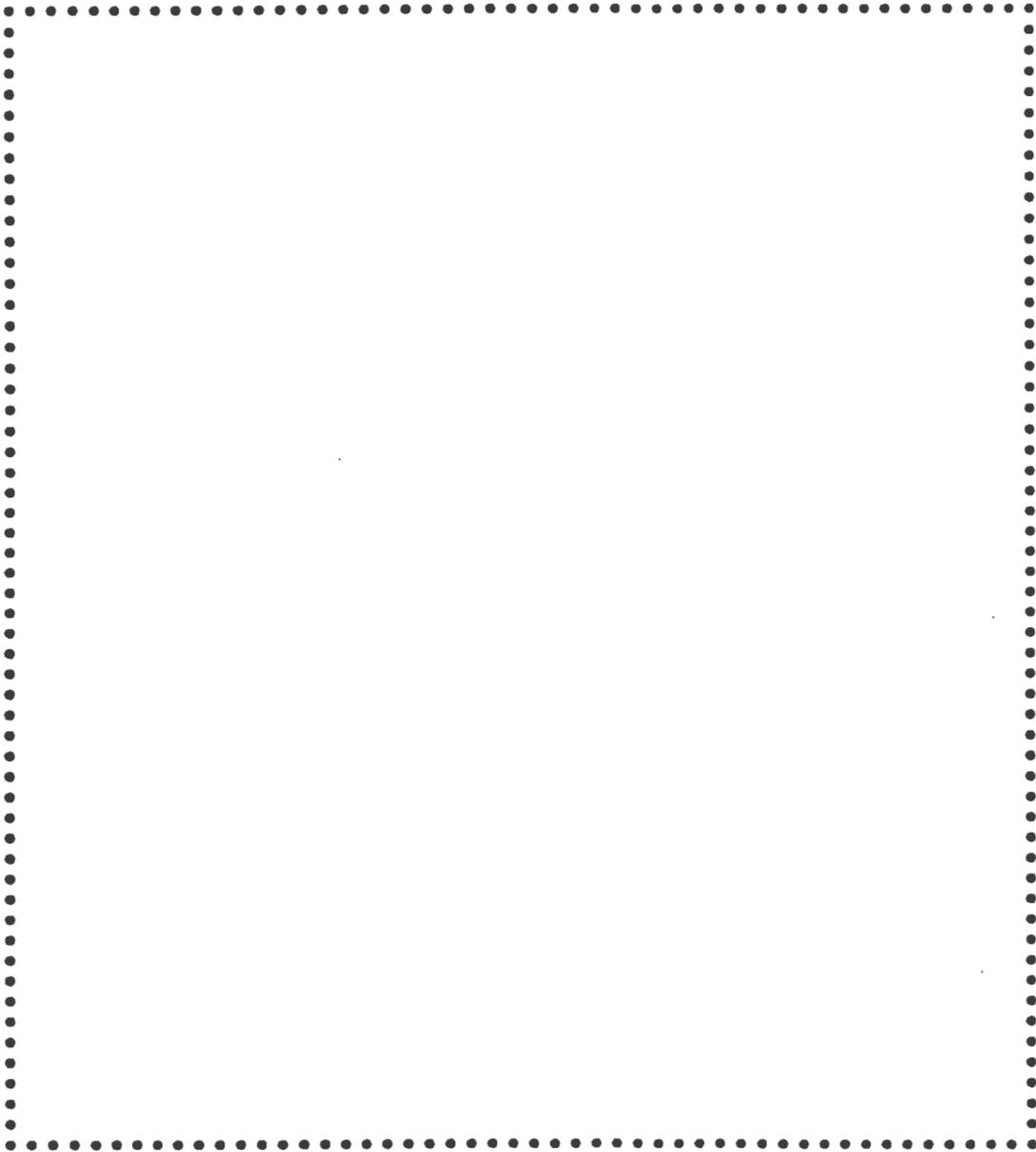
\_\_\_\_\_

15. Go to the **table in the center** of the room. Find the **cones** from a Sierra redwood and a coast redwood. How are they different from each other?

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Draw them here:



What are the three ways that Sierra redwood seeds are released from their cones?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

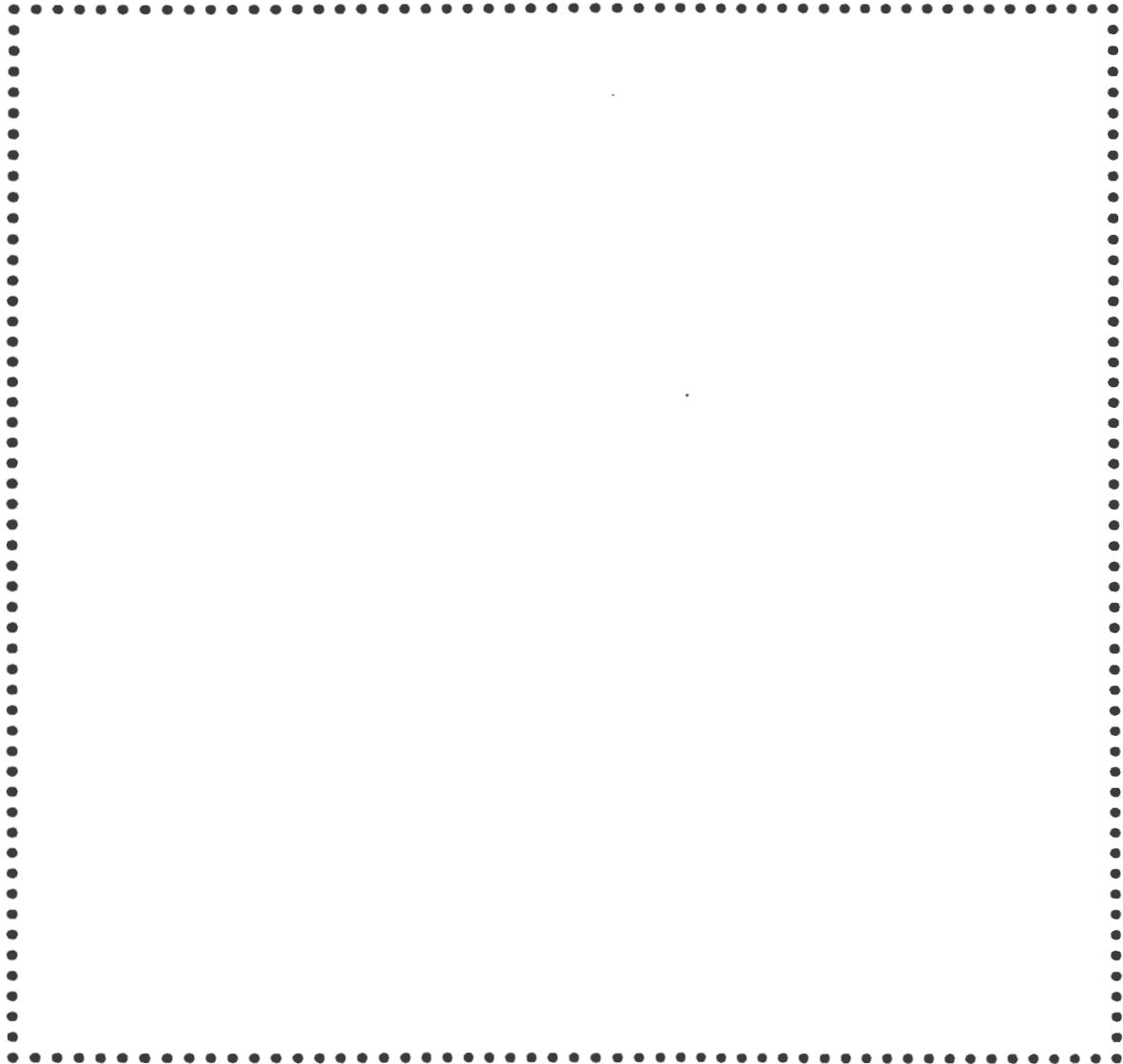
# Animal Observation

Quietly watch your animal for a while. See if you can find out these things and include them in your picture:

- What it eats
- Where it lives
- How it protects itself
- What kinds of sounds it makes
- Its coloring

What is your animal's name? \_\_\_\_\_

Draw your animal here:

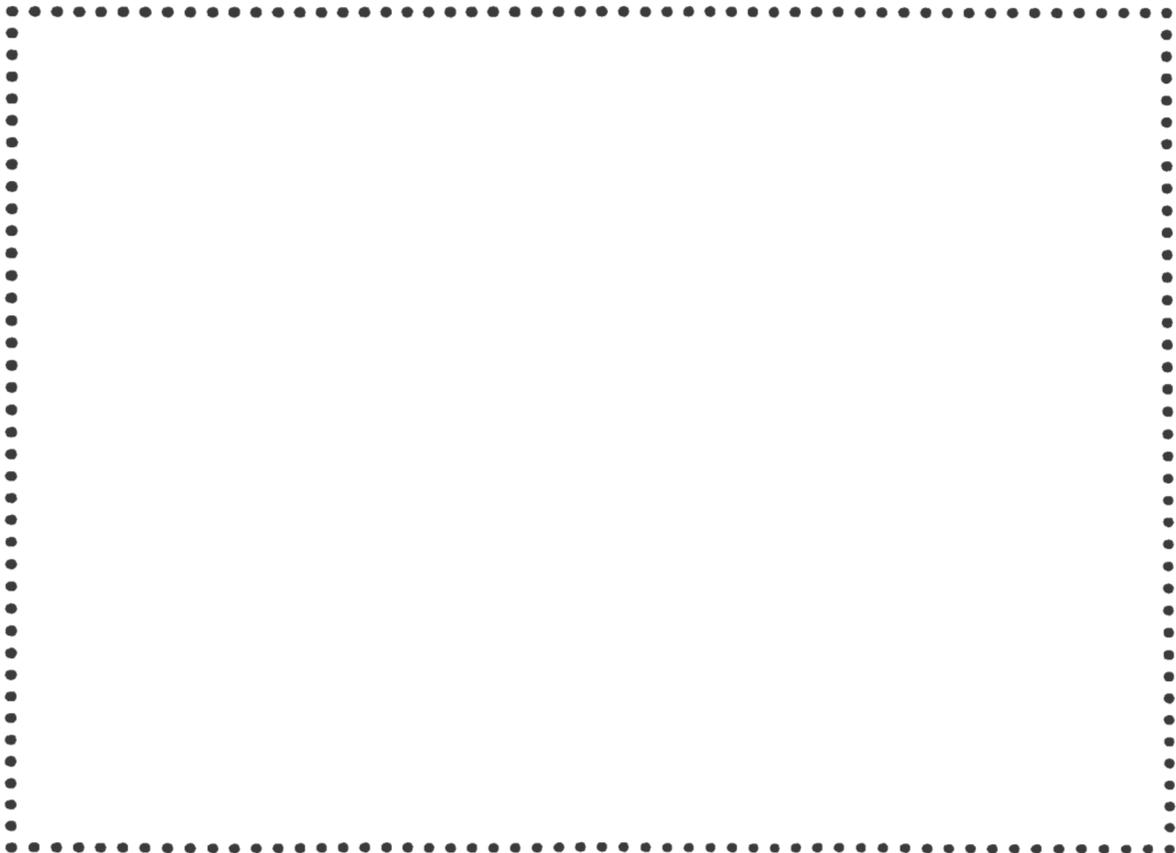


# Scavenger Hunt

Please put everything back where you found it (except litter, of course!) and remember to stay on the trail. When you find something on the list, show it to a friend or teacher, and draw or write about it on this page. Have fun!

See if you can find these things in the forest:

1. A seed holder
2. Stored sunlight
3. Something very soft
4. Something purple
5. Something perfectly straight
6. A tree protector
7. Part of an animal
8. The smallest living thing you can see
9. Something unnatural
10. Something in nature that is important
11. Something smooth
12. A spiral shape
13. Something rough
14. Something you've never seen before
15. Puzzle pieces
16. Exactly 100 of something
17. Something beautiful
18. Something that reminds you of yourself
19. Something that makes a noise
20. A big smile



## Visitor Center Treasure Hunt (page 74)

### Answer Key

Since some of the questions involve choices made by the students, only the questions that have specific answers are included below.

#### 5. **Giant Survivors:**

- Sierra redwoods are the giant survivors.
- They are called giant survivors because individuals can live for 3,000 years, grow very large, and are descendents of a plant family that has been on earth for millions (180) of years.
- The oldest recorded age of a Sierra redwood is 3,300 years (3,200 according to some sources).
- The tree in the park with the largest cone is the sugar pine.

6. The Miwok Indians ground acorns with the **mortar and pestle**.

7. The Miwok Indians used the **pump drill** to drill holes in shells and stones for jewelry.

#### 8. **Big Trees Discovered!**

- Calaveras Big Trees became a State Park on July 5, 1931.
- Augustus T. Dowd discovered the Big Trees in 1852.

#### 11. **Map of the Park**

- The South Grove is larger than the North Grove.
- The North Grove is closest to the Visitor Center.
- You cross the Stanislaus River on the way to the South Grove.

#### 15. **Table in the Center of the Room**

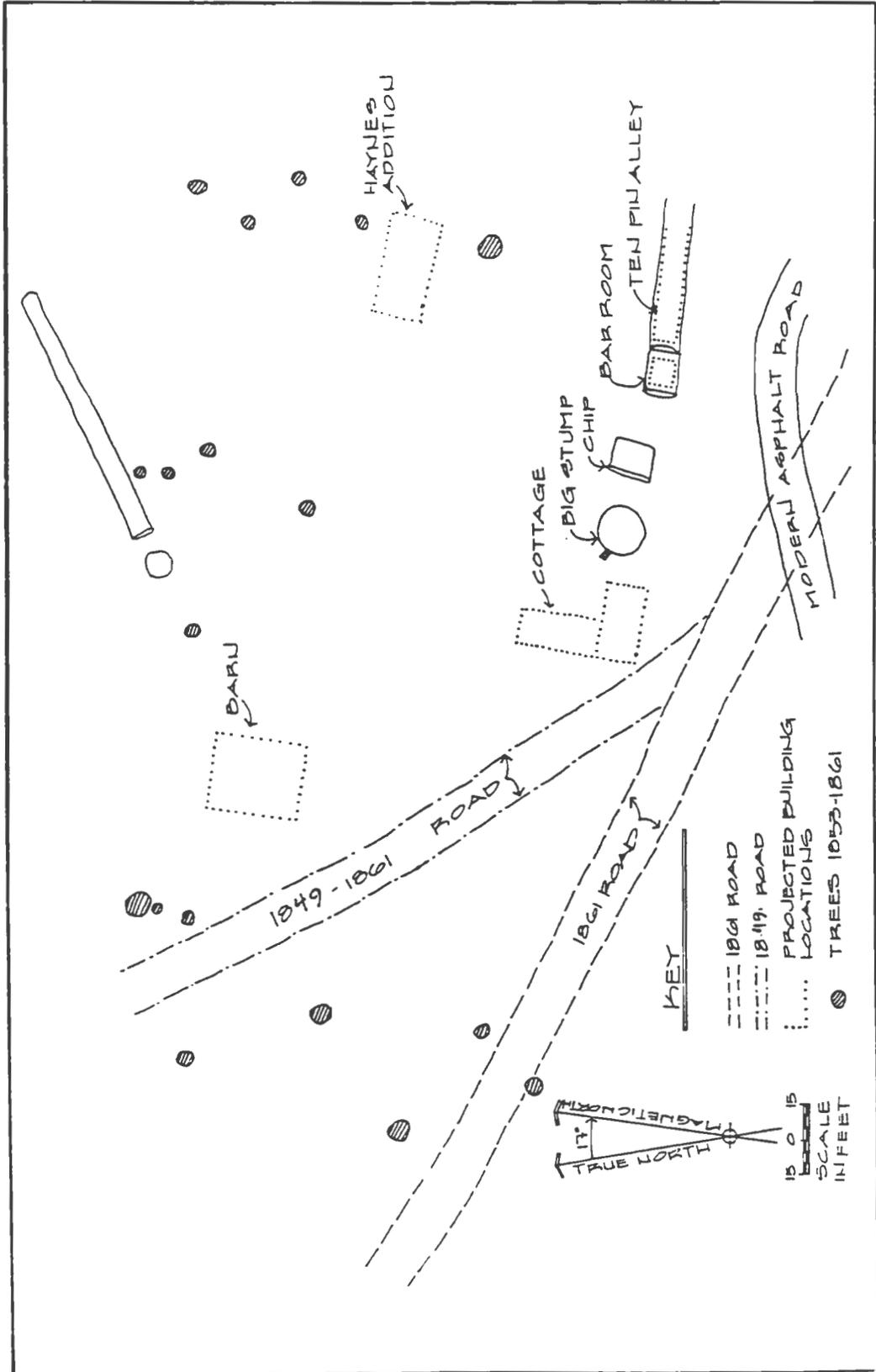
- Sierra redwood cones are bigger and hold more seeds than the coast redwood cones.
- Sierra redwood seeds are released from their cones by:
  1. Fire
  2. Insects
  3. Squirrels

## Scavenger Hunt (page 79)

### Hints for the Teacher

1. Cone, acorn, berry, etc.
2. A leaf or needle.
6. Tree bark, or a ranger.
10. Everything in nature is important.
15. Sugar and ponderosa pine both have puzzle piece bark.

# NORTH GROVE HISTORY MAP

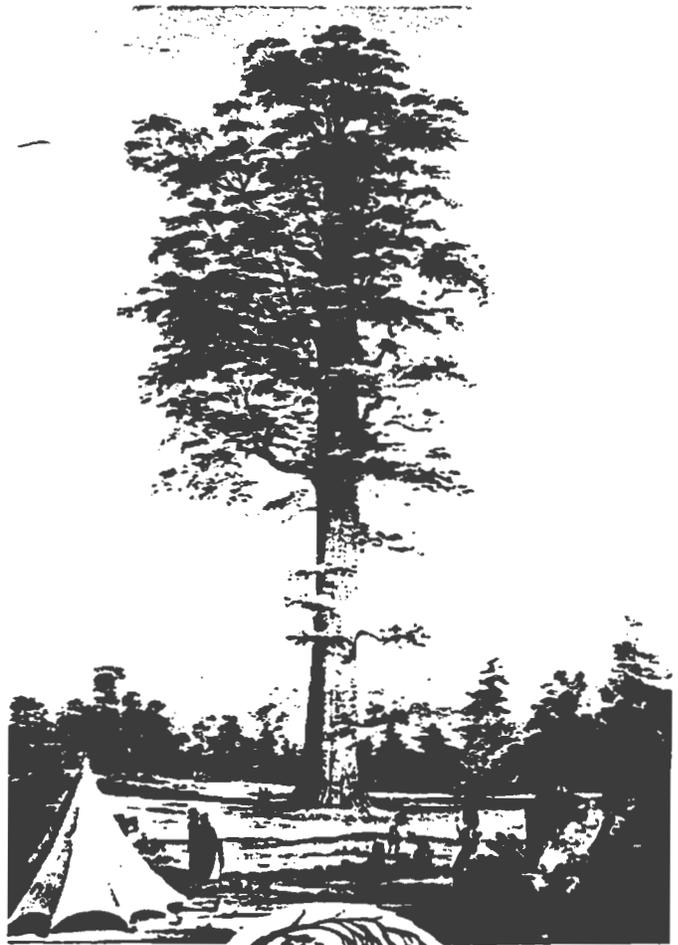


See Activity on page 70.



SECTION C:  
AFTER YOUR VISIT:  
SUGGESTED ACTIVITIES

*The Redwoods, once seen,  
leave a mark or create  
a vision that stays with you  
always. No one has ever  
successfully painted  
or photographed a Redwood  
tree. The feeling they  
produce is not transferable.  
From them comes silence  
and awe. It's not only their  
unbelievable stature,  
nor the color which seems  
to shift and vary under  
your eyes, no, they are not  
like any trees we know.  
They are ambassadors  
from another time.*  
—John Steinbeck, 1962







## After Your Visit: Suggested Activities

The following are suggestions for ways of bringing together the students' new knowledge and outdoor experience. Many activities suggested previously in this guide would also be appropriate for post-trip activities.

### **Culminating Celebration**

Have a culminating celebration for the unit of study combining any of the activities below. Students can bring "Tree Treats" (Project Learning Tree), *i.e.* treats that come from trees. For example:

- ▲ Maple syrup
  - ▲ Nuts
  - ▲ Fruit
  - ▲ Spiced cider (apples and cinnamon)
  - ▲ Coconut
  - ▲ Dates
- ...Be creative!

### **Trivia Game**

If you made a trivia game on your trip, play it during the week after your field trip to reinforce concepts and information. Instructions for making the game are in Section B, page 66.

### **Class Mural**

Using painting, drawing, or collage materials create a mural of the Sierra redwood forest. Include the plants and animals of the forest community, the creek, the redwoods, and anything else on which you have focused in your studies.

**Before /After  
Pictures**

If you did "before" pictures of the Sierra redwood trees, do the "after" pictures and make comparisons. This activity is described in Section A, page 13.

**Game Show**

You can play "Password" with vocabulary words (see Glossary in Section D), and "Jeopardy" or "Trivial Pursuit" with redwood facts.

**Charades**

Students act out words drawn from a bag. These can be words from the glossary in Section D, pages 91-93, or names of plants and animals they saw at the park. Try playing "Pictionary" or "Win, Lose, or Draw" with the words. In these games students draw pictures of the words and their teammates try to guess the word.

**Crossword Puzzle  
or Word Search**

Have the students design one of these puzzles using vocabulary words from the glossary in Section D. Students then trade and try to work each others' puzzles.

T  
R  
S  
E  
Q  
U  
O  
I  
A  
P  
R  
K

**One Day  
in the Life of...**

Have the students write a letter or journal entry describing a day in the life of:

- ▲ Augustus T. Dowd
- ▲ John Muir
- ▲ A guest staying at the Mammoth Grove Hotel
- ▲ A 2,000-year-old redwood
- ▲ An animal living in the park

**Newspaper Article**

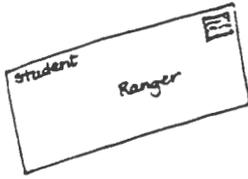
Have the students write an article for the school or community newspaper about your trip to the park.

**Posters**

Design a poster about the park that addresses one of these topics:

- ▲ Why we should preserve Sierra redwoods.
- ▲ The best thing to do at Calaveras Big Trees State Park is....
- ▲ I like Sierra redwoods because....
- ▲ What I saw at the park.

### Write a Letter or Invitation



Rangers and docents love to hear from classes that visit the park. Send letters to the person who spoke to your class in care of the park (address is in the front of the guide). Students can also write a letter to a student who hasn't been to the park yet... maybe someone who will be in your class next year. Have the students write an invitation to someone they would like to take to the park, such as their parents, brothers and sisters, grandparents, or a friend.

### Conservation Projects

Get your class involved in a project that helps conserve natural resources such as:

- ▲ Planting native plants around school
- ▲ Recycling paper, aluminum, and glass
- ▲ Hosting school clean-up day or a litter-a-thon
- ▲ Monitoring your class energy and/or water use
- ▲ Getting involved with a local park or natural area project
- ▲ Developing and maintaining a local study area or nature trail

### Creative Expression

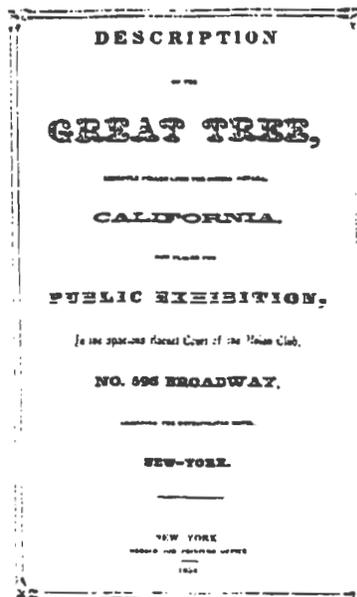
Have students write a story, poem, comic strip, song, rap, puppet show, or commercial based on the experience they had at the park.

### Interview

Write and act out mock interviews with park residents such as a Ranger, docent, animal, or redwood tree. Invite a Ranger or docent to your class and do a real interview.

### Travel Brochure

Write an advertisement or travel brochure for the park. It can be written for the present, for the 1800s, or for the future.



**Songs**

Learn and sing songs about trees and the environment in general. Look in the Recommended Resources section under "Music," page 96, for some excellent tapes.

**Books**

Read books about trees, wildlife, and ecology. Look in the Recommended Resources section under "Books For Children," page 97.

**Conservation  
Issues**

There are many conservation issues confronting us today. Have students find out what they are by sharing information from newspaper and magazine articles. Look at the processes for resolving these tough issues. If your students show an interest in an issue, they can write to public agencies and conservation groups to express their concerns and request information.

Acid Rain  
Water Rights  
Worries About Spills  
Save The Rhinos  
Ship Still Leaking Oil—  
Cleanup Battle Heats Up

## SECTION D: APPENDICES

Glossary

Recommended Resources

Plants and Animals of the Sierra Mixed-Conifer  
Forest Community

School Group Reservation Request Form

*Any fool can destroy trees. They cannot defend themselves or run away. And few destroyers of trees ever plant any, nor can planting avail much toward restoring our grand aboriginal giants. It took more than three thousand years to make some of the oldest of the sequoias, trees that are still standing in perfect strength and beauty, waving and singing in the mighty forests of the Sierra. Through all the eventful centuries since Christ's time, and long before that, God has cared for these trees, saved them from drought, disease, avalanches, and a thousand storms; but he cannot save them from sawmills and fools; this is left to the American people.*

—John Muir







## Glossary

Many of the words listed have additional or broader meanings. The definitions apply specifically to concepts presented in this guide.

**adaptation:** A change in structure, function, or form that improves the chance of survival for an animal or plant within a given environment.

**bark:** The outer protective layer of a tree.

**buttressing:** In trees, the process of growing more wood at the base; this sometimes occurs on just one side of the tree in response to conditions that have caused it to lean.

**Calaveras:** Means "skulls" in Spanish; Calaveras County was named after Calaveras Creek, which was so named because of three skulls found in a cave next to the creek.

**cambium:** The layer of cells between the bark and wood of a tree that differentiates to become sapwood and inner bark.

**carnivore:** A consumer that feeds on animals; a predator such as a hawk, snake, or bobcat.

**circumference:** The measurement of the line bounding a circle.

**coast redwood:** *Sequoia sempervirens*. The world's tallest trees; grow naturally only in the coast ranges of California from the Santa Lucia Mountains to southern Oregon.

**community:** An association of interacting plants and/or animals inhabiting a common environment.

**conifer/coniferous:** A cone-bearing tree.

**conservationist:** A person who advocates protection, preservation, renewal, and wise use of natural resources.

**consumer:** An organism that cannot make its own food and must feed on living material.

**Cretaceous:** The period when redwoods were at the height of their dominance; 65-135 million years ago.

**decomposer:** Organisms that break down dead material into simpler forms.

**diameter:** The length of a straight line passing through the center of a circle from one edge to the other.

**docent:** A trained park volunteer; volunteer with the Calaveras Big Trees Association.

**ecosystem:** The interactions of the living members of a community with the non-living elements of the environment; *eco* means "household," *system* means "a set of interactions."

**environment:** The total of all the surroundings that affect the life of plants and animals.

**exhibit:** An educational public display.

**fibrous:** Composed of thread-like structures, or fibers.

**food chain:** The transfer of energy and nutrients from plants through a series of animals with repeated eating and being eaten (from Project WILD).

**food web:** An interlocking pattern of food chains.

**germination:** Beginning of growth in plants; to sprout from seed.

**giant sequoia:** Another name for Sierra redwood.

**habitat:** The arrangement of food, water, shelter, and space required by animals for survival.

**heartwood:** The inner wood of the tree; heartwood is no longer living, but provides stability and strength.

**hemisphere:** Half of a sphere; half of the earth.

**herbivore:** A consumer that feeds only on plants; for example: mule deer and squirrels.

**inner bark:** The layer of cells that transports manufactured sugars throughout the tree.

**Miwok:** The word that means "people" in the Miwok language; native people of the central Sierra Nevada and its foothills.

**mortar and pestle:** Stone tools used by the Miwoks for grinding acorns, nuts, and seeds.

**omnivore:** A consumer that feeds on both plants and animals; for example: black bears and raccoons.

**predator:** An animal that hunts and kills other animals for food.

**prescribed burn:** A carefully planned and controlled fire used as a management tool to improve the health of forest or range lands.

**preservationist:** A person who advocates protection and preservation of natural resources.

**prey:** Animals that are killed and eaten by other animals.



- producer:** Green plants that convert the sun's energy into food by the process of photosynthesis.
- pump auger:** Tool used to drill holes to make wooden pipes; type of tool used to fell the tree that is now the Big Stump.
- ranger:** A person whose job it is to protect park resources and inform park visitors.
- relict:** A plant or animal species living on in isolation in a small local area as a survivor from an earlier period or as a remnant of an almost extinct group.
- saprophyte:** A plant that lives on decayed organic matter in the soil; a plant that lacks chlorophyll and cannot synthesize its own food; for example: certain types of fungi.
- sapwood:** The layer of wood that transport water and minerals from the roots throughout the tree.
- scavenger:** A consumer that eats only dead animals (that they haven't killed); for example: vultures and fly larvae.
- seed dispersal:** The process by which seeds are scattered away from the parent plant.
- Sequoiadendron giganteum:*** Scientific name for Sierra redwood; means "giant sequoia tree."
- Sequoia sempervirens:*** Scientific name for coast redwood; means "everliving sequoia."
- Sierra mixed-conifer forest:** A community of plants and animals that lives on the western slope of the Sierra Nevada between about 2,000 and 7,000 feet elevation; characteristic trees of this community are ponderosa pine, sugar pine, white fir, black oak, and incense-cedar.
- Sierra Nevada:** Mountain range in eastern California; home of the Sierra redwoods; means "snowy range" in Spanish.
- Sierra redwood:** *Sequoiadendron giganteum*. The largest objects to have ever lived on the earth; grow naturally only in 75 groves on the western slope of the Sierra Nevada.
- speculator:** A person who becomes involved in new projects for the sole purpose of financial gain.
- tannin:** Tannic acid; a chemical present in the wood and bark of many plants, including Sierra redwoods; aids in resisting decay, disease, and insect attack.



## Recommended Resources

### **Sierra Redwood Ecology and History**

- \* *The Big Tree and the Big Stump*. Frances E. Bishop. Frances E. Bishop, 1985.
- \* *California Redwood Parks and Preserves*. John B. Dewitt. Save the Redwoods League, San Francisco, CA. 1985.
- \* *The Enduring Giants*. Joseph H. Engbeck, Jr. California Department of Parks and Recreation, Sacramento, CA. 1973.
- \* *Giant Sequoias*. Harvey, Shellhammer, Stecker and Hartesvelt. Sequoia Natural History Association, Inc. Three Rivers, CA. 1981.
- \* *History of The Sierra Nevada*. Francis P. Farquahar. University of California Press, Berkeley, CA. 1965.
- The Sierra Nevada*. Stephen Whitney. Sierra Club Books, San Francisco, CA. 1979.
- \* *Sierra Nevada Natural History*. Storer and Usinger. University of California Press, Berkeley, CA. 1971.
- \* *To Find The Biggest Tree*. Wendell D. Flint. Sequoia Natural History Association, Three Rivers, CA. 1987.

### **Environmental Education Curriculum**

- \* *Sharing Nature With Children and Sharing The Joy of Nature*. Joseph B. Cornell. Dawn Publications, Nevada City, CA. 1979 and 1989.

*Project WILD.* You must attend a workshop to obtain this excellent resource. It is an interdisciplinary, supplementary environmental and conservation education program emphasizing wildlife. It was written by and for teachers, and is co-sponsored by the California Department of Education. For information about Project WILD (and Project Aquatic) please contact:

Project WILD Coordinator  
California Department of Fish and Game  
Conservation Education Branch  
1416 Ninth Street, 12th floor  
Sacramento, CA 95814  
916/445-7613

*Project Learning Tree.* You must attend a workshop to obtain this excellent resource. It is an interdisciplinary, supplementary environmental and conservation education program emphasizing trees and the forest community. For information about Project Learning Tree please contact:

Project Learning Tree Coordinator  
Department of Forestry and Fire Protection  
1416 Ninth Street  
PO Box 944246  
Sacramento, CA 94244-2460  
916/323-2498

*The California State Environmental Education Guide, K-6.* Alameda County Office of Education, 1989. For information please contact:

Alameda County Office of Education  
Media Sales  
313 West Winton Avenue  
Hayward, Ca 94544-1198

*Teaching Science in an Outdoor Environment.* Phyllis Gross and Esther Railton. University of California Press, Berkeley, CA. 1972.

## Music

*Banana Slug String Band.* This exciting music is an effective tool for teaching science concepts. The Banana Slugs also do school assemblies and teacher inservices. For information, tapes, and songbooks, write or call:

|                         |                     |
|-------------------------|---------------------|
| Music For Little People | or: B.S.S.B         |
| PO Box 1460             | PO Box 717          |
| Redway, CA 95560        | Pescadero, CA 94060 |
| 800/346-4445            | 415/879-0697        |

*Billy B. Sings About Trees.* Fun music for teaching all about trees. For information please contact:

Do Dreams Music  
PO Box 56232  
Takoma Park, MD 20912

**Books for Children**

- The Giving Tree.* Shel Silverstein. Harper and Row, New York, NY. 1964.
- The Lorax.* Dr. Suess. Random House, New York, NY. 1971.
- \**The Tree Giants.* Bill Schneider, DD Dowden. Falcon Press Publishing C., Helena, CA.
- \**The Calaveras Big Trees State Park Activity Book.* Numerous local artists contributed to this book. Calaveras Big Trees Association, 1987. Available only at the Visitor Center.

**Field Guides \***

There are many excellent field guides available which cover every aspect of life in the park. Most can be found in the natural science section of book stores. There are many for sale at the Visitor Center.

**Films**

Check your county's media catalog for films about Sierra redwoods. You may be able to find the following:

*Redwoods.* 1972. 20 minutes. Grades 7-12.

*Redwood Trees.* 1960. 15 minutes. Grades 7-8.

*Trees.* 1977. 11 minutes. Grades K-6.

*Trees, The Biggest and The Oldest Living Things.* 1982. 17 minutes. Grades 4-8.

**Resource Agencies**

When planning your unit on the park, be sure to make use of the resource agencies in your community. They will often be able to send information to your class. These agencies include:

California Department of Parks and Recreation  
California Department of Fish and Game  
U.S. Fish and Wildlife Service  
U.S. Forest Service

Many conservation organizations will send information to your class as well. The Save-the-Redwoods League is a good source of information about all the members of the redwood family. Their address is:

Save-the-Redwoods League  
114 Sansome Street  
San Francisco, CA 94104

**Sierra Redwood  
Seeds  
and Seedlings \***

Seeds and seedlings are usually available for sale at the Visitor Center.

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\* Usually available at the park Visitor Center.





## Plants and Animals of the Sierra Mixed-Conifer Forest Community

### Trees



#### California Black Oak

*Quercus kelloggii*

This species of oak provided a staple food for the Miwok Indians. The 1-inch-long acorn was ground into flour and used in many ways. One third of the acorn is covered with a deep bowl-shaped scaly cup. The deciduous leaves are 3 to 6 inches long, and have five to seven toothed lobes. The gray-black bark is heavily ridged. These oaks grow up to 100 feet tall, and have a short trunk leading to a rounded crown.

#### Incense-Cedar

*Calocedrus decurrens*



It is sometimes hard to distinguish incense-cedars from Sierra redwoods because of their similar bark, crown shape, and foliage. The reddish-brown bark of the incense-cedar is deeply and irregularly furrowed, and is hard rather than soft like Sierra redwood bark. Cedar foliage is bright green, with small overlapping scales on branchlets that look as though they have been ironed flat. Each small cone has six scales and is shaped like the classic *fleur-de-lis*. They can grow to be 100 to 150 feet tall, with 3- to 4-foot diameters. When young, the trees have dense conical crowns, which become rounded as they mature. This is not the aromatic cedar that is often used to keep moths out of our woollens, but may smell familiar as it is commonly used in making pencils.

### **Ponderosa Pine**

*Pinus ponderosa*



Also called yellow pine, this tree is distinctive because of the tufts of 5- to 10-inch-long needles growing from its branches. Each bundle typically contains three needles. Ponderosa pines attain heights of 150 to 200 feet, diameters of 3 to 4 feet, and have slightly rounded tops. The yellowish-brown bark consists of scaly plates composed of small "jigsaw puzzle pieces." The oval cones are 3 to 4 inches long, and have a stiff prickle on each scale. Ponderosa pine seeds are an important food source for squirrels.

### **Sierra Redwood**

*Sequoiadendron giganteum*



When mature, these trees are easy to identify because they are the largest living things on the earth! The largest trees have diameters of 30 feet and heights of over 300 feet. Their reddish bark is soft and fibrous. The blue-gray leaves are small and scale-like, resembling juniper foliage. They are arranged spirally on a rounded twig. The cones are the size and shape of a chicken egg and can contain up to 300 small, flat seeds, which resemble a flake of oatmeal. Young redwoods are pyramid-shaped, like a perfect Christmas tree. Old Sierra redwoods have rounded tops, very large branches, and often bear large burn scars.

### **Sugar Pine**

*Pinus lambertiana*



This is the tallest and most massive of all the pine species in the world, with some individuals attaining heights of well over 200 feet and diameters well over 5 feet. This pine also bears the longest cones, which can be over 2 feet long. The cones typically are borne at the very ends of the sugar pine's long branches, resembling a person daintily holding them with their fingertips. The 2- to 4-inch-long needles are in bundles of five, and the brownish-purple puzzle-piece bark is broken into scaly ridges. Whorls of horizontal branches lead to a pyramid-shaped crown.

### **White Fir**

*Abies concolor*



You will not usually find the cones from this tree laying on the ground. The 3- to 5-inch oblong cone disintegrates while attached to the branch, slowly releasing its seeds. The flat, blue-green needles are 2 to 3 inches long. The dark grey bark is heavily ridged. White firs can grow to be 125 to 150 feet tall, and have a domed crown.

## Mammals

### Black Bear

*Ursus americanus*



The only bears now living wild in California, black bears are the smallest, most common and widespread bear in North America. They are found in the forests, swamps, and mountains of the western U.S. from Alaska to Texas. Their color can vary from black to cinnamon to nearly white or blue. The face is usually brown, and there is often a white breast patch. They can grow to be 5-6 feet long, 2-3 feet high at the shoulder and weigh 200 to 400 pounds. Black bears are not true hibernators, but can become dormant during the winter months if they have enough body fat. One to four cubs are born to a female bear in January, during the winter dormancy. The cubs spend two summers with their mother before heading off on their own. Black bears are omnivores and will eat just about anything, including: insects and insect larvae, fish, berries, grass, bulbs, acorns, mice, squirrels, chipmunks, honey, and even carrion. Mature bears are mostly solitary animals. They are primarily nocturnal, have poor vision, moderate hearing, and an excellent sense of smell.

### Black-Tailed Deer

*Odocoileus hemionus columbianus*

(A subspecies of mule deer.)



This is the only deer with black on its tail. The ears are large (like a mule's), the tail is ropelike, and the belly, throat patch and rump patch are white. Their coat is a reddish color in the summer, turning brownish gray in winter. They have good senses of hearing and smell. They are found in all the western U.S. from Alaska to Mexico. Black-Tailed deer migrate, spending summers in the mountains, and winters in the valleys and foothills. They are most active in mornings, evenings, and on moonlit nights. They are seen singly or in small groups in the summer, and become more gregarious in winter. They feed on grass, moss, leaves, forbs, and twigs, and like all ruminants, they chew cud. The bucks grow antlers each year, which are shed by late winter. When first born, the fawns are camouflaged with spotted coats. They do not have a strong deer smell, and lie still to avoid detection by predators. If you find a fawn, do not pick it up or move it, even if it is alone. The mother is probably waiting for you to leave. Predators of deer include mountain lions, coyotes, bobcats, and people.

### Douglas Squirrel

*Tamiasciurus douglasii*



This small tree squirrel is also called a chickaree. Their bodies are only 7 inches long, with a 5- to 6-inch-long tail. They are dark reddish olive, with a yellowish or rusty belly. In the summer there is a distinct black line on its sides, and in winter they appear grayer. They are found in coniferous forests from British Columbia to mid-California. This vociferous squirrel is active

during the day. Chickarees do not hibernate, but eat food that has been stored in underground caches. The caches are located not by memory, but by smell. They eat seeds from pine and fir cones, the scales from sequoia cones, acorns, grass seeds, mushrooms, and bird eggs. Their nests are built either inside a hollow tree, or in a well hidden spot outside high in a tree, and are made of twigs, lichen, and bits of shredded redwood bark. Predators of chickarees include pine martens, fishers, weasels, bobcats, foxes, and hawks.

### Little Brown Myotis

*Myotis lucifugus*

(Also little brown bat.)



Of the 15 species of bats in the Sierra, this is one of the most common and widely distributed. Bats are the only mammal that truly flies, and have been the subject of many false rumors. Bats do not nest in peoples' hair or turn into vampires. Most types of bats eat insects or fruit, and not human blood. They fly by virtue of greatly lengthened finger bones that support thin wing membranes made of a double layer of skin that extends to the hind legs. The thumb is free, and bears a claw. The little brown myotis has long, silky hair that is cinnamon to dark brown on top, and buff to gray below. They roost singly or in clusters during the day in caves, rock crevices, or holes in trees. They begin flying and feeding on insects in the early evening, usually in forested areas or near water. Although not all bats use echolocation to find their food, little brown bats use this natural type of sonar to follow and catch their prey in total darkness. They utter high-pitched squeaks, which are inaudible to humans, and hear the echoes of the sounds as they bounce back off insects and nearby obstacles. In this way, bats can find their prey in the dark and avoid hitting obstructions. Their flight pattern is quite distinctive as they hover, come to instant stops, and twist and turn in their quest for insects. They make other sounds, such as clicks and squeaks that are audible to humans. Weighing less than 1/2 ounce, a bat may easily eat its own weight in insects during one night's feeding. It eats rapidly until it is full, quickly digests the meal, and fills its stomach again. This may be repeated 3 or 4 times a night. Bats drink by scooping water into their mouths as they fly low over the surface of a pond or stream. In winter they either hibernate or migrate south. Owls and hawks are among their few predators, but most die of old age.

### Northern Flying Squirrel

*Glaucomys sabrinus*



Northern and southern flying squirrels are the only nocturnal squirrels. Although northern flying squirrels are found from Alaska to New Mexico, not much is known about this rarely seen animal. The body of this tiny squirrel is only 5-6 inches long, with a 4- to 5-inch-long tail. Their thick, soft fur is glossy olive-brown above, and white below. They do not really fly, but they can

glide up to 125 feet in a horizontal direction due to the folded layer of loose skin extending from the front leg to the hind leg. They glide from tree trunk to tree trunk, often landing with an audible thump. They live in nests in woodpecker holes, or build outside nests of leaves, twigs, and bark. They are solitary most of the year, but become gregarious during the winter months. They do not hibernate. They feed on seeds, nuts, insects, bird eggs, and meat if available. Their predators include martens, weasels, fishers, and owls.

### **Raccoon**

*Procyon lotor*



Because of their boldness around humans, one of the most commonly seen mammals at the park are raccoons. They are easily identified by their black "mask" across the eyes and black and gray stripes on the tail. Raccoons prefer to live near water, where they catch much of their food with their sensitive hands. Their omnivorous diet includes frogs, insects, insect larvae, fish, bird eggs, berries, small mammals, and fruit. Their species name *lotor* means "one who washes." They have been observed "washing" or dunking their food in water, but there is no known explanation for this behavior. Raccoons are often seen in family groups, especially in winter when they band together for warmth. They can exhibit surly, short tempers, and are often heard quarreling noisily. They mate in winter, with young being born 9 weeks later, between January and April. The female raises the two to seven young through the first winter, after which they separate. They don't hibernate in winter, but can go into a heavy sleep. Their tracks resemble a small human handprint, and are often found along muddy banks. Do not use food to encourage raccoons to come close to you. They are wild animals that can be harmed by eating human food, and can also harm you with sharp teeth and claws.

### **Birds**



### **Brown Creeper**

*Certhia americana*

This small bird is only 5 inches long. Its streaked brown back gives it excellent camouflage. The underparts are white, and there is a pale band across the wing. The bill is thin and decurved for prying insects, insect eggs and larvae from the bark. The tail is stiff to brace it for climbing. Using its tail as a prop, it climbs up the trunk of a tree in a spiral, feeding as it goes. Then it flies to the base of another tree and begins again. Its nest is under a loose strip of bark low on a tree trunk. It is solitary, but often travels with groups of chickadees, nuthatches, woodpeckers and kinglets.

### Western Tanager

*Piranga ludoviciana*



When male western tanagers are in their breeding plumage they are the most colorful birds in the park. The red head, bright yellow body and contrasting black wings and tail stand out amid the green forest foliage. The female and young tanagers do not have the red head, and are more yellow-green than the males. Tanagers leave their wintering grounds in Mexico in the spring, bringing a burst of color to the Sierra in May. They stay for most of the summer, building cup shaped nests on horizontal branches. They use their thick bills to feed on insects, fruits, and berries.

### Reptiles and Amphibians



### California Mountain Kingsnake

*Lampropeltis zonata*

This is a colorful, shiny snake, with black, red, and white bands. Unfortunately, they are sometimes killed because they are mistaken for the poisonous coral snakes. Coral snakes do not occur in the Sierra Nevada. The pattern of color and rings causes predators to avoid this reptile. Prey is either constricted or grabbed by the mouth and swallowed. They feed on lizards, eggs, nestling birds, and other snakes, including rattlesnakes. They occur throughout the Sierra, and favor moist cool canyons. They can grow to be over 3 feet long.

### North Pacific Rattlesnake

*Crotalus viridis oreganus*

(*Subspecies of Western Rattlesnake.*)



This poisonous, but beautiful snake varies in color from cream, brown, or green to black with dark blotches. The head is broad, flat, and triangular. This stout-bodied snake has a tapering tail which ends with a series of interlocking pieces of dry skin called a rattle. The rattle produces a buzzing sound, which is known to frighten a variety of animals. Rattlesnakes rattle when they want to be left alone. They are silent when hunting so as not to scare away potential meals. The snake's venom is used very effectively to obtain food that would otherwise be too large to catch. They eat lizards, mice, ground squirrels, small rabbits, birds, and chipmunks. Venom is injected by squeezing the muscles over the poison producing glands, which then forces the venom through two hollow, needle-like fangs. If a fang is broken off, a reserve fang may move into functional position within a few hours. Rattlesnakes have good vision, but may also detect warm-bodied animals by facial pits which allow the snake to detect slight temperature changes. They also track down prey using their keen sense of smell. Odor particles are picked up on the tongue, which is then placed on the Jacobson's Organ, on the roof of the mouth. The predators of rattlesnakes include black bears, ravens, red-tailed hawks, and kingsnakes. These snakes stay in dens

### Dark-Eyed Junco

*Junco hyemalis*



Only 5-6 inches long, this bird is solid brown with a black "hood" and a pinkish-white bill. The dark tail has white outer feathers, which are visible when it flies. Also known as "snowbirds," these year-round park residents are rather tame, and often sing in winter and early spring while in their winter flocks. They forage on the ground for seeds, buds, fruit, and insects. Their nest is a grass cup on the forest floor. Though they forage and nest on the ground, they often sing from an elevated perch.

### Pileated Woodpecker

*Dryocopus pileatus*



At 16-19 inches long, this is the largest Sierran woodpecker. It is mostly black, with a spectacular red crest. There is a white strip on its thin neck, and the males have a red "moustache." Woodpeckers are well adapted to eating insects found in dead trees. They have stiff tails, which act as a brace when climbing trees, chisel-like bills, strong skulls, long extensible tongues, and zygodactyl feet (two toes pointing forward and two pointing backwards). The pileated woodpecker chisels large rectangular holes in dead trees, and often chisels apart entire white fir snags in search of food. They live in mixed and coniferous forests.

### Spotted Owl

*Strix occidentalis*



This dark brown owl is strictly nocturnal. It has a round, puffy head, a barred pattern underneath and dark eyes. It lives in dense, old-growth forests, and eats insects, small birds, and flying squirrels. It builds its nest in hollow trees or old hawk nests. Breeding pairs require several hundred acres of mature forest. Because they are vulnerable to habitat disturbance they are a threatened species in several states.

### Steller's Jay

*Cyanocitta stelleri*



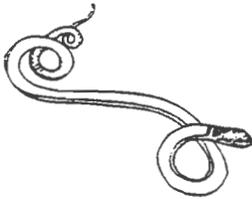
This is the 1-foot long, noisy blue and black bird you can count on seeing at the park. It is the only jay west of the Rockies with a crest on its head. It lives in coniferous and pine-oak forests of the western United States. Its long, stout, pointed bill enables it to eat many types of food such as insects, berries, nuts and seeds. Its nest is a bowl made of twigs, rootlets and pine needles, built in a conifer. They are very aggressive, and you may notice them hopping from branch to branch up a tree. They can mimic the call of a red-tailed hawk.

during a period of winter dormancy, emerging when the temperature reaches about 70° F.

Rattlesnake bites rarely cause human death. Almost all rattlesnake bites can be prevented by watching where one walks, puts one's hands, or sits. The best prevention is to keep a safe distance at all times. Methods of treatment for rattlesnake bites change frequently, and the American Red Cross should be consulted for the latest accepted methods. Western rattlesnakes are found throughout the Sierra, up to a height of 11,000 feet, and can grow to a length of 65 inches.

### Ringneck Snake

*Diadophis punctatus*



This small, docile snake is dark olive, bluish, or nearly black on top with a bright red-orange or yellow ring about its neck. The underside of its body is the same color as the neck band, and is exposed to predators to startle them during an attack. This non-poisonous snake then seeks cover to escape the attacker. Their food consists of slender salamanders, tree frogs, small lizards, earthworms and insects. They are found throughout the Sierra beneath logs, rocks and loose leaves in damp spots. They can grow to be 18 inches long.

### Rubber Boa

*Charina bottae*



This plain brown snake with shiny, smooth skin is the only Sierran member of the boa family. It is yellowish underneath, has a small head and a blunt, head-like tail. When attacked, it often hides its head under the coils of its body and exposes its blunt tail as a decoy for its head. Because of these adaptive traits, it is sometimes called the "two-headed snake." Like other members of the boa family, it constricts its prey, usually small rodents and fledgling birds. This is a slow-moving, docile, non-poisonous snake that will rarely bite when captured. They occur throughout the Sierra, most often near streams, meadows, and occasionally on the forest floor. They can grow to be 29 inches long.

### Sierra Nevada Salamander

*Ensatina eschscholtzi platensis*



You may not see this creature unless you look underneath rotting logs, bark, or rock piles. This salamander has smooth brown or gray skin, covered with bright orange blotches, and a swollen tail that is constricted at the base. If it feels threatened it will assume a defensive posture, which consists of stiff legs, a sway back, and arched tail. They feed on earthworms, sow bugs, millipedes, centipedes, spiders, and insects.

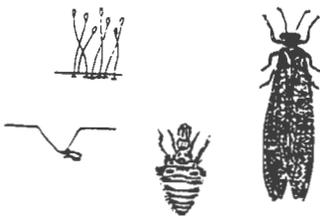
### Western Fence Lizard

*Sceloporus occidentalis*



The distinguishing feature of this small black or brownish-gray lizard, is its blue throat and belly. These blue markings help the males to establish and hold a territory, and to attract a mate. Perching on a prominent location, the male displays his vivid markings by doing "pushups": repeatedly lowering his throat, raising his head and inhaling air to increase his size. They feed on beetles, flies, wasps, termites, ants and spiders, and are found throughout the Sierra.

### Insects



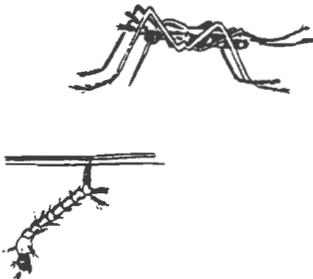
### Antlions

*Myrmeleontidae* Family

The larvae of antlions, often called doodle bugs, make small cone-shaped pits in sandy or dusty areas. The larvae lie below the soil in the pit with only their jaws exposed, waiting to feed on ants and other insects which fall into this pit. The larvae pupate in a cocoon, emerging as adult antlions, which have four long wings, a slender body, and long, club-shaped antennae.

### Black Snow Mosquito

*Aedes ventrovittis*



Mosquitos are one of the most well-known insects, due to the blood-sucking habits of the pregnant females. There are 47 species of mosquito known in California, including the black snow mosquito, which can live up to 11,000 feet in the Sierra Nevada. This species attacks during the day in large clouds, often in open meadows. The larvae (also called wigglers) are found in shallow pools after the snow melts. Despite their annoying habits, mosquitos and mosquito larvae are one of the most important food sources for insect-eating birds, bats, dragonflies, and fish.

### California Sister

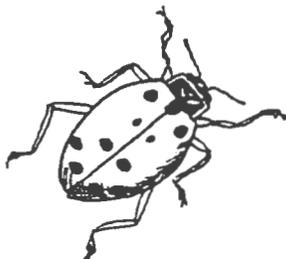
*Adelpha bredowi*



Along with monarchs, this butterfly belongs to the Nymphalidae (or brush-footed butterfly) Family. It is easily recognized by its pattern of white spots on dark wings, with one orange spot near the tip. It has a sailing flight. The green larvae are found on oak trees. They are found in the foothills and mid-elevation mountains throughout the state.

### Convergent Ladybird

*Hippodamia convergens*



There are more than 125 different species of "ladybugs" in California. Convergent ladybird beetles assemble in huge masses in the canyons and hills of the Sierra Nevada for hibernation. They are often seen when the overwintering groups begin to disperse on warm days in February or March. They migrate to the valleys to feed on aphids, returning to the mountains in May or

June when the valley vegetation is drying out. When disturbed, they secrete a bitter fluid that is believed to have a poisonous effect on vertebrates. The larvae are elongated and gray with orange markings.



**Phymatodes Beetle**

*Phymatodes nitidus*

This longhorn beetle is the only insect known to play a role in Sierra redwood seed dispersal. The Phymatodes beetle eggs are laid in the Sierra redwood cones. The larvae feed on the inside of the green cones. This progressively kills the cone scales, which dry out and release the seeds.

**Red Turpentine Beetle**

*Dendroctonus valens*

This small, reddish-brown beetle belongs to the bark beetle family. This group of insects kills more trees than all other forces combined, including forest fires. The adult female red turpentine beetles bore an entrance tunnel into the bark of a tree near its base, and then lay eggs in egg tunnels between the bark and the wood. After the eggs hatch, the white, legless larvae excavate burrows at right angles to the egg tunnels. When the population grows large enough, the burrows, called galleries, can encircle the tree or limb, cutting off the flow of water and food, and killing the parts of the tree beyond that point. The red turpentine beetle lives in all kinds of pines throughout the Sierra Nevada and Coast Ranges.



**Shrubs  
and Small Trees**



**California Hazelnut**

*Corylus californica*

The soft, fuzzy, tooth-edged leaves help identify this freely spreading shrub. The male flowers are in hanging catkins, and the female flowers in small scalelike clusters, from which protrude bright red stigmas. The fruit is an edible nut. They are found in moist areas of mixed-coniferous forests.

**Mountain Dogwood**

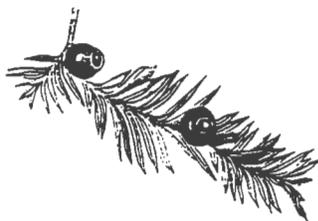
*Cornus nuttallii*



This striking flowering tree flourishes in moist areas of the Sierra mixed-coniferous forest. The flowers appear before the smooth leaves in spring on this deciduous tree—usually from late April through May. The white “petals” are actually bracts which surround the central cluster of tiny yellow flowers. After the bracts fall off, the flowers grow into bright red fruits, which are eaten by chipmunks and squirrels.

### Western Yew

*Taxus brevifolia*



This small evergreen tree occurs in cool, moist areas. Its sharply pointed, shiny, needle-like leaves are arranged in flat sprays. Western yew is unusual in that each individual plant is either male or female. This type of plant is called *dioecious*, meaning "two houses." Most conifers are *monoecious* with their male and female parts on the same plant. These trees are conifers, but do not have the typical conifer cone. Instead, the fruit is a hard seed, surrounded by a fleshy salmon-colored berry. The North Grove is the only place in the world where Sierra redwood and western yew grow together. This is the southernmost extent of the yew's distribution, and close to the northernmost extent of Sierra redwood distribution.

### Wildflowers and Other Interesting Plants

### Bracket Fungus

*Coriolus*

As soon as the wet weather arrives in the fall, you will start seeing many types of fungi (or mushrooms) pushing their way up through the earth. It takes years of study to be able to correctly identify the hundreds of different species of fungi. Since many mushrooms are poisonous, do not try picking any for eating purposes unless you are an expert.

Fungi lack chlorophyll and cannot synthesize their own food. These plants commonly live on dead organic material and are important in the process of decomposition. The part of the plant that we usually see is called the fruiting body. This contains the spores that will grow into new fungi. Under the ground are masses of white filamentous material called *mycelium*. This is the main body of the plant, from which the fruiting body grows.

One of the most common types of fungi found in forests throughout the United States are the bracket fungi which grow on dead wood. The leathery fruiting body is a rosette shape, and they are often found in clusters on a dead log or branch. The upper surface has numerous narrow multicolored zones of brown, gray, blue, and black, and is soft and velvety to the touch, especially after a rain. The microscopic spores are released from tiny tubes on the underside of the fruiting body.

### Hooker's Fairy Bells

*Disporum hookeri*



This is a fun flower to look for. The creamy-white to greenish bell-shaped flowers are hiding under the last leaf on the stem. The flowers bloom from April to June. After that you will find scarlet berries instead of flowers. This is a low-growing plant, with alternating, ovate-shaped leaves.

**Pine Violet**

*Viola lobata*



Look for this deep yellow violet from April through July. The two upper petals are purplish on the back, and the lower three have purplish veins. The leaves of this violet are unusual because instead of being heart shaped they are divided into three to seven lobes. This is a common plant in the North Grove area.

**Snow Plant**

*Sarcodes sanguinea*



If you visit the park in early spring just as the last snow is melting, be sure to look for this unusual plant. When it first pushes its way up through the thick humus, it looks like a bright red stalk of asparagus. Later the bracts open to reveal the bell-shaped flowers. This plant lacks the chlorophyll that causes most plants to be green, and does not photosynthesize. Recent research has shown that snow plants attach themselves to the roots of conifers. Little is known about this relationship, but it may be mutually beneficial, enabling the trees to absorb more water and nutrients from the soil. This plant is edible, but please do not pick it—snow plants are rare and protected by law.

**Striped Coral Root**

*Corallorhiza striata*



It will take a good flower detective to find this small, native orchid that blooms from May to July. It is a saprophyte, living only on decayed matter. The pinkish-yellow or whitish flowers are streaked with purple, and the stems are brownish to purple or yellow. There can be several flowers on one stalk.

**Trail Plant**

*Adenocaulon bicolor*



This plant is quite common in the North Grove. The leaves grow in a circle close to the ground, and are shaped like arrowheads. If you flip over a leaf, you will see the wooly white underside. Folklore maintains that the Native Californians could track people that had walked through patches of trail plant because the turned-over leaves clearly pointed the way. The small, white, tubular flowers bloom on a slender stalk from June to August.

## CREDITS

This guide was designed and written by Wendy Faris, Interpretive Specialist at Calaveras Big Trees State Park.

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Illustrations by David Gano are on pages 7, 16-19, 28, 30, 39, 41, 69, 71, 89.

Illustrations by Pearl Tucker are on pages 26, 69, 101-110.

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