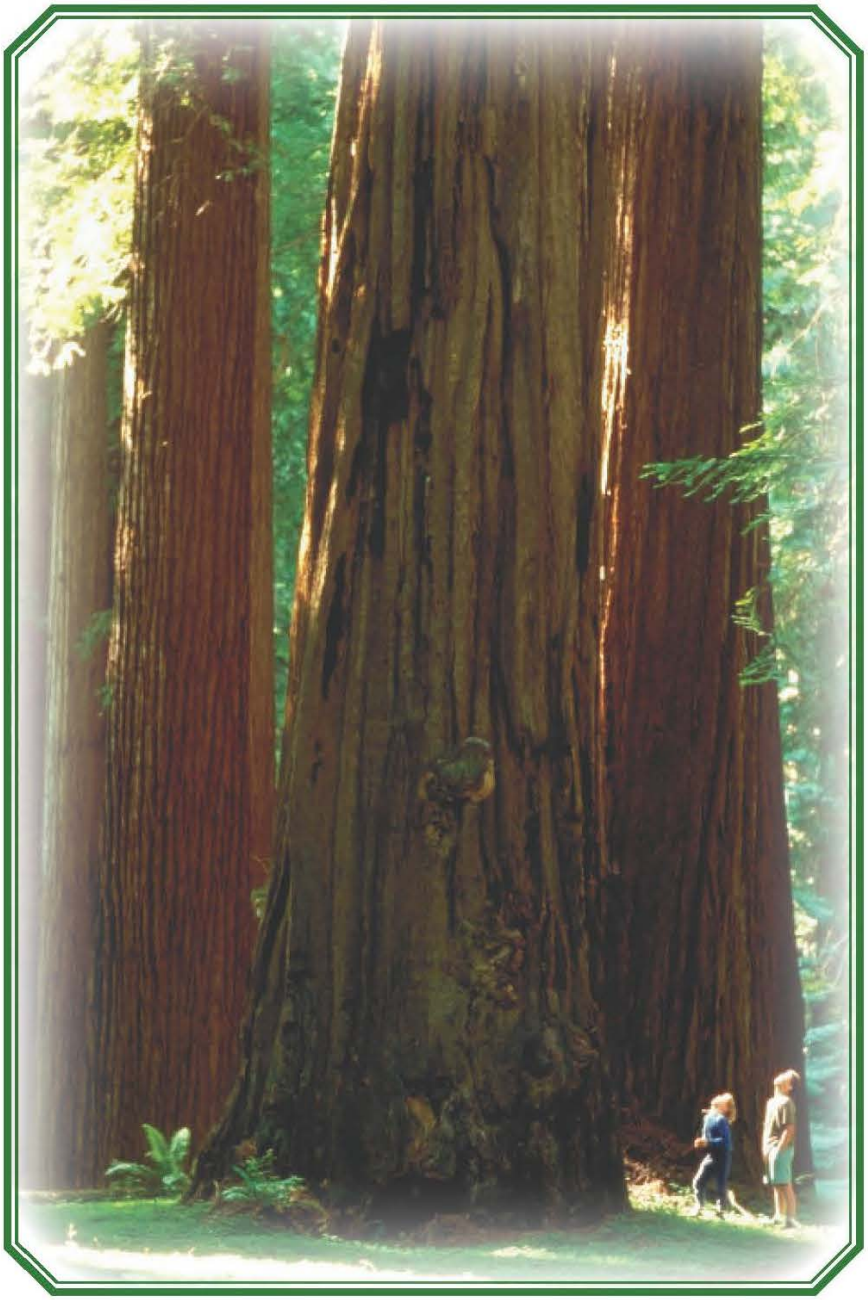
Redwood Ed

A Guide to the Coast Redwoods for Teachers and Learners



By Michael Roa

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A Guide to the Coast Redwoods For Teachers and Learners

Written by
Michael Roa

Illustrated by
Faith Rumm

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(916) 654-2249
interp@parks.ca.gov

A printed copy of *Redwood Ed* can be obtained by contacting:
Stewards of the Coast and Redwoods
PO Box 2
Duncans Mills, CA 95430
(707) 869-9177
stewards@mcn.org

Redwood Ed may also be downloaded from the Internet at www.parks.ca.gov or www.stewardsofthecoastandredwoods.org

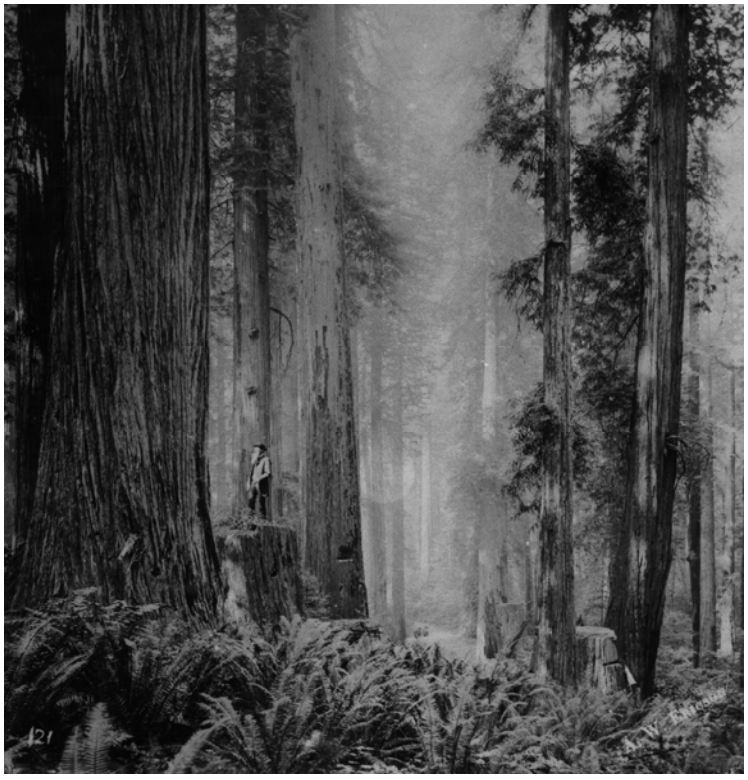
About the Author

For over 38 years, Michael Roa has been involved in public education. He has taught at the elementary, middle school, high school, and college levels. Environmental issues have been a central concern throughout his teaching career, and his students have undertaken numerous award-winning conservation projects. He is the author of *The Environmental Science Activities Kit* and *A Guide to the Side of the Sea*, which is similar to *Redwood Ed* but focuses on the rocky coast. Now retired from teaching, he continues his work in environmental education while living in Sebastopol, California. He can be reached at: mroa@sonic.net .

About the Illustrators

Faith Rumm runs her own studio, specializing in interpretive exhibit design. She especially loves to create art and design that celebrates nature, cultural, and historical subjects. More of her work can be viewed at: < www.rummstudio.com >.

Dan Miller is a Senior Biologist, retired from the California Department of Fish and Game. He had just completed his excellent *Life History and Ecological Guide to the Coast Redwood, Sequoia sempervirens* as I starting to write *Redwood Ed.* Dan generously offered to not only review *Redwood Ed* and to share his illustrations, but also to do some specifically for *Redwood Ed*. Dan can be reached at his home address: 735 Cathedral Dr., Aptos, CA 95003.



(Photo courtesy of Ericson collection, Humboldt State University)

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When *Redwood Ed* was first conceived, in the summer and fall of 2005, I contacted numerous people to see whether there was a need for such a guide. While the people that I talked with are too numerous to mention, their enthusiasm and support for the project led directly to the creation of *Redwood Ed*.

As I wrote *Redwood Ed*, I asked people from many related fields to review what I wrote. They provided many corrections and helpful suggestions. Their many contributions about the content, writing, and educational pedagogy have been invaluable. Having reviewed a portion of *Redwood Ed* does not imply that reviewers agree with or endorse everything in *Redwood Ed.* Reviewers of *Redwood* Ed include:

Bill Anderson, Del Norte High School, Crescent City, CA
Kay Antunez de Mayolo, Project Learning Tree, California Department of Forestry and Fire Protection, Sacramento, CA
Steve Barnhardt, Professor of Botany, Santa Rosa Junior College, and Education Director, Pepperwood Preserve, Santa Rosa, CA
Matt Bischoff, Historian III, California Department of Parks and Recreation, Monterey, CA
Eric Bull, Professor and Chair of Teacher Education, William Jessup University, Rocklin, CA
Kim Cabrera, Humboldt County Office of Education, Eureka, CA
Karen Correa, Teacher, Orchard View School, Sebastopol, CA
Doris Dickinson, Docent, Armstrong Redwoods State Reserve, Guerneville, CA
Susan Doniger, District Interpretive Specialist, California Department of Parks and Recreation, Eureka, CA
Bill Filsinger, Teacher, Mary Peacock Elementary School, Crescent City CA
Arlene Fuller, Mendocino County University of California Cooperative Extension 4-H Program Representative, Mendocino County, CA
Ruskin Hartley, Executive Director, Save-the-Redwoods League, San Francisco, CA
Susan Ingersoll, Education Program Manager, Save-the-Redwoods League, San Francisco, CA
Mike Jani, Chief Forester, Mendocino Redwood Company, Ukiah, CA
Sondra Madson, Teacher, Grace Hudson Elementary School, Crescent City, CA
Fred Mc Pherson, Lecturer, University of California, Santa Cruz, CA

Dan Miller, Volunteer and lecturer in Santa Cruz area State Parks and schools, Aptos, CA
Scot Pipkin, Naturalist, San Mateo County Outdoor Ed Program, La Honda, CA
Dan Porter, Director of Science and Planning, Save-the-Redwoods League, San Francisco, CA
Darryl Ramos-Young, (former) Education Program Manager, Save-the-Redwoods League, San Francisco, CA
Rick Rayburn, Chief, Natural Resources Division, California Department of Parks and Recreation, Sacramento, CA
Natalie Schaefer, M.S., Naturalist, Educator, and Consultant, Paso Robles, CA
Ralph Schardt, Executive Director, Michael Lee Environmental Foundation, San Jose, CA
Jeff Self, Teacher and Environmental Educator, Eureka, CA
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Tracey Weiss, Executive Director, Exploring New Horizons Outdoor School, Felton, CA
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(In alphabetic order)
Big Sur Natural History Association
California Department of Parks and Recreation
California Community Forest Foundation
California State Coastal Conservancy
California State Parks Foundation
Dean Witter Foundation
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Mendocino Redwood Company
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Valmet / Komatsu Forest Equipment Company

Michael Roa, September 2007

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INTRODUCTION

Fortunate, and increasingly rare, is the child who gets to visit one of our magnificent coast redwood parks to enjoy and learn about one of California's natural treasures while on a school field trip. It was not always so. When I started teaching in Santa Clara County in 1969, most teachers I knew took their students on one or more field trips every year. As a high school science teacher, I was able to take my students on annual expeditions to the coastal tide pools, chaparral regions, marshlands of San Francisco Bay, and Big Basin Redwoods State Park, among other places. Loss of natural areas to urban development, shrinking budgets, increased concern over liability, and pressures to "teach to" the standardized tests have resulted in ever fewer field trips for today's students.

In *Last Child in the Woods – Saving Our Children from Nature-Deficit Disorder*, Richard Louv reminds us that many children today spend most of their play time indoors, and that many are not even allowed to roam freely in what outdoor play areas are available in their neighborhoods. Even rarer is the opportunity to explore a natural area. Louv also writes eloquently about how important experiences in nature are, not only to a child's physical and mental health, but to the health of the planet. Children who experience nature first-hand are more likely to become environmentally responsible adults and stewards of their – our – natural resources. Aside from the practical value of learning about the redwoods, spending time in the redwoods – or other natural areas – can be inspirational, exciting, interesting, and even therapeutic (Louv, 1995).

What is Redwood Ed?

Redwood Ed is a resource for those who want to learn about the coast redwood community and those who want to help others learn about the redwoods. In one document, *Redwood Ed* provides the user with:

- ✓ Information on the human history of the coast redwood region
- ✓ Information on basic scientific principles (sort of a review of high school science)
- ✓ Information on the science particular to the coast redwood ecosystem
- ✓ Information on how to set up and conduct a field trip to a redwood park
- ✓ Lessons and activities for before, during, and after a park visit
- ✓ Up-to-date resource and contact lists

While Redwood Ed focuses on the coast redwoods, much of the natural history background in Section I, and many of the lessons in Section IV, would be useful in studies of other types of forest ecosystems.

Redwood Ed is written for teachers, docents, parents, youth group leaders, naturalists, and anybody else who wants a comprehensive guide to the coast redwood forests and parks. It is intended to provide information in a format that is easy to use and understand, rather than an in-depth scientific study of the redwood region and parks. *Redwood Ed* is useful throughout the redwood region, from southern Oregon to Big Sur. The focus of *Redwood Ed* is on the coast redwood, *Sequoia sempervirens.* While the coast redwood has much in common with the giant Sequoia redwood of the western

Sierra, *Sequoiadendron giganteum*, there is enough difference between the two, both in human history and natural history, to save the giant Sequoias for another guide.

Redwood Ed does not go into great depth about specific local history or conditions. The reader who wants to know more about specific parks or areas should contact the individual park and/or visit a local bookstore or museum, or check for resources on the Internet. Many outdoor schools, parks, and cooperating associations have written guides for their specific areas. *Redwood Ed* is intended to supplement and complement them rather than to replace them.

Why Redwood Ed?

There are many reasons for the creation of *Redwood Ed*. The increasing rarity of outdoor education opportunities makes those opportunities ever more valuable. When a child does get to visit a redwood park, or any other natural area, it is important to maximize the enjoyment and appreciation of the park, and also to maximize the opportunities for learning.

Redwood Ed is intended to provide information about the coast redwood ecosystem. The intent is to provide accurate information about the redwoods; it is not intended to be propaganda, either against the redwood forest products industry, or against protecting and conserving the redwoods.

Some elementary teachers, parents, and youth group leaders have a strong background in science and natural history, but many do not. Elementary teachers may have majored in English, social science, math, art, education, or any one of a number of areas other than science. One of the few exposures to nature that many elementary school classes experience is participation in an "outdoor education" camp, often in fifth or sixth grade. The staffs of outdoor ed schools do a good job. *Redwood Ed* enables the classroom teacher to support the outdoor education program or school and extend the learning to the classroom both before and after the outdoor education experience. *Redwood Ed* is also useful in the training of outdoor ed staffs, including volunteers.

The coast redwood community is such a unique ecosystem that even people who are very knowledgeable about science may miss many valuable opportunities to learn and teach. *Redwood Ed* provides dozens of ideas for teaching about the redwoods.

Redwood Ed provides a brief summary of major ecological principles and other information that all teachers ought to have in order to understand the environment upon which we all depend. The scientific information in *Redwood Ed* goes beyond what teachers should expect elementary students to know and understand, but it is important for the teacher's understanding of the coast redwood community. The scientific information in *Redwood Ed* provides a quick review of the ecological principles taught in most high school science classes, as well as information on the unique characteristics of the coast redwood forests.

Even those who know the science of the redwoods may not know the human history of the region. *Redwood Ed* includes a summary of some of the major ways in which humans have influenced, and been influenced by, the coast redwoods - from the Native Americans to the heyday of redwood logging in the 1940s and 1950s, to modern redwood logging practices.

Except for some activities that were created by the author, all of the information in *Redwood Ed* can be found in other sources. Few elementary teachers, parents, or youth group leaders, however, have the time or resources to find and use all of those sources. *Redwood Ed* pulls together, in a way that non-specialists can easily understand and use, the most important information that one ought to know prior to taking children on a field trip to a redwood park.

A trip to a redwood park should not be an isolated activity. Rather, it should be part of a larger unit of study. It is important that students view their visit to the redwood forest not as just a day out of the classroom or just a day in the woods. A field trip to the coast redwood forest should be enjoyable, of course, but it should also provide the student with opportunities to learn about and increase their appreciation for these magnificent giants and the natural and human communities in which they live.

It is hoped that by learning about the natural environment, children (and adults!) will increase their appreciation of the natural world and will become more willing to be actively involved in the protection of our environment. Understanding of the coast redwood ecosystem is necessary if we are to not only enjoy and protect the redwoods in our parks, but to wisely manage redwood forests as a valuable resource.

How to Use *Redwood Ed*

Redwood Ed is divided into four sections:

Section I provides background scientific information, including a review of basic scientific and ecological principles, and descriptions of some of the more common or important organisms of the redwood forest.

Section II deals with the human history of the redwoods, from the early Native Americans to modern times.

Section III explains how to plan and execute a field trip to a redwood park.

Section IV provides lessons and activities that can be done before, during, and after a trip to the redwood parks. Most of the activities and lessons could be used in other forest types, or even non-forest ecosystems.

Users are encouraged to skim all sections, focusing on areas where their background is not so complete. Use as much or as little as suits your needs! For your convenience, some information is repeated in different sections.

Docents, naturalists, and others who are knowledgeable about the coast redwood ecosystem can use *Redwood Ed* to supplement their current resources. It can provide a basis for developing a guide for a specific area; since *Redwood Ed* is written for the entire redwood region, educators who want to go into depth about a specific area will need to supplement the general information found in *Redwood Ed*.

While a teacher (or parent, naturalist, docent, or youth group leader) does not have to be an expert on the ecology of the coast redwoods, a basic understanding of ecological principles will enable the teacher to help students to maximize their learning during the precious time spent in the redwood forest or park. *Redwood Ed* provides that basic knowledge, and teachers and other users can use it to review basic science content before taking students on a field trip to the redwood forest.

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To help the students prepare for their visit to the redwood forest, a number of pre-trip activities are provided. Many of these activities are intended to be "discovery" activities, in which the teacher helps the students discover things…to "construct knowledge" for themselves. The teacher should select activities that are appropriate for age, grade, and experience level of their students, and should, of course, feel free to modify the suggested activities as they see fit. **It is very important to try out all activities before doing them with students.**

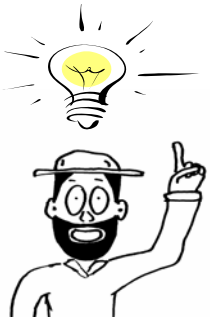
Activities that can be done while on the field trip or park visit are also provided. While some of these activities require "scientific" equipment, most can be done with little or no special materials. It is highly recommended that the teacher visit the site and talk with the ranger, naturalist, and/or docent before the actual field trip. The local specialists will be able to suggest additional activities and where they can best be done.

The study of the redwood forest should not end when the students get on the bus or into the cars to return to school. Post-trip activities are provided; some of these, too, are discovery activities. As with pre-trip activities, teachers should select and modify the activities as appropriate for their students and circumstances. Many of these activities include involving students with efforts to protect the redwood parks.

The activities suggested in Redwood Ed are correlated with the California State Content Standards in science, history/social studies, mathematics, and English for grades 4, 5, 6, and 7. In addition, the activities are correlated with California's recently developed Environmental Principles and Concepts.

Interspersed throughout the science and history background information are "Teaching Ideas" that you might find useful. These are simple demonstrations, connections to make, things to point out, and other tips. Look for them in *italics*, with the "Redwood Ed" image (icon) beside them. Redwood Ed icons will also alert you to potential safety issues in lessons and activities.

Teaching Idea



Safety Alert

Section III of *Redwood Ed* includes the information that you will need to arrange for a visit to a state redwood park or to arrange for a visit led by a park interpreter, ranger, or volunteer docent.

Appendices include a partial listing of California State Content Standards in science, math, social science, and English, in abbreviated form. The various activities are correlated to these state standards.

Also included is a glossary of useful terms, which are in **bold** lettering the first time they are used in the text. The appendices also include listings of organizations and agencies, books, and other resources that the teacher might find useful.

In the resources section, in addition to a listing of useful resources, I've indicated my "Top 10" resources as well as some resources suitable for younger children.

About State Standards

State Content Standards are an important part of the educational landscape in California's public schools today. Content Standards are certainly important, and they can be very useful in planning and assessing educational programs. Some teachers, however, are concerned that there is too much emphasis on cognitive learning – memorizing facts without allowing time for depth of understanding or the development of

skills and learning processes. Others are concerned about the development of the whole child, including all learning styles and the psycho-motor and affective domains. The study of nature in the field provides a wonderful opportunity to encourage the development of the whole child and to extend the classroom learning into the "real world."

Teachers who want to bring classes to visit the redwoods may need to justify the use of class time and scarce resources for the trip. The activities and lessons in *Redwood Ed* can be used to help teach California State Content Standards in science, math, English, and social studies. Each lesson helps teach one or more standard particularly well. Those main standards for the lesson, which I've called "Focus Standards," are stated at the beginning of the lesson. Most lessons also can help teach other standards, which are identified by numbers. The California State Content Standards that Redwood Ed addresses are listed in Appendix I in abbreviated form.

Most Content Standards in science focus on cognitive (knowledge) learning. Participation in hands-on activities such as those in *Redwood Ed* can help the student develop the skills emphasized in the Investigation and Experimentation Standards that are listed at the back of the Science Content Standards.

About California's Environmental Principles and Concepts

California has recently developed a set of Environmental Principles and Concepts which examine the interactions and interdependence of human societies and natural systems. These are not intended to be an additional set of state standards. Rather, they provide a summary of important principles that can be taught in the subject matter areas. As teachers plan their science, history, mathematics, and English lessons, they might look for opportunities to incorporate those principles and concepts into their lessons. As *Redwood Ed* is being written, an *Environmental Education Model Curriculum* is also being developed and should provide numerous examples of how to incorporate environmental education into curricular areas. The Environmental Principles and Concepts are listed in Appendix I.

For information on the *Environmental Education Model Curriculum* or the Environmental Principles and Concepts, contact:

Gerald A. Lieberman, Ph.D.
Principal Consultant
California Education and the Environment Initiative
13648 Jackrabbit Road
Poway, CA 92064

< Gerald@seer.org >