THE CONIFER CONNECTION

A Resource for Learning and Teaching About Coniferous Forests and Watersheds

California Community Forests Foundation

Michael Roa

California State Parks Since 1864

The Conifer Connection

A Resource for Learning and Teaching About Coniferous Forests and Watersheds

Written by
Michael Roa

Illustrated by
Faith Rumm

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www.parks.ca.gov/teachersguides

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For over 40 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, A Guide to the Side of the Sea*, and *Redwood Ed*, which is similar to *The Conifer Connection* but focuses on the coast redwoods. Now retired from teaching, he continues his work in environmental education while living in Sebastopol, California. He can be reached at: mroa@sonic.net

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Michael Roa
April 2011

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Audubon Society: Kern Chapter

Audubon Society: Mount Diablo Chapter

Audubon Society: Sierra Foothills Chapter

Big Sur Natural History Association

California Coastal Commission

California Native Plant Society: Alta Peak Chapter

California Native Plant Society: East Bay Chapter

California Native Plant Society: North Coast Chapter

California Native Plant Society: San Hedrin Chapter

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INTRODUCTION

Fortunate, and increasingly rare, is the child who gets to visit one of our magnificent forested parks to enjoy and learn about California's natural treasures while on a school field trip. It was not always so. When I started teaching 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 our environment, spending time in the forests–or other natural areas–can be inspirational, exciting, interesting, and even therapeutic (Louv, 1995).

Environmental education can help students achieve state content standards. Many state standards cannot only be taught in a natural environment, but may be taught best in a natural environment. In *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning* (2002), Lieberman and Hoody state that "Evidence gathered from the 40 study schools indicates that students learn more effectively within an environment-based context than within a traditional educational framework. This evidence comes from site visits, interviews, survey results, and gains on both standardized test scores and GPAs." They go on to say that "The observed benefits…include…better performance on standardized measures of academic achievement in reading, writing, math, science, and social studies."

What is *The Conifer Connection*?

The Conifer Connection is a resource for those who want to learn about coniferous forests and watersheds, and those who want to help others learn about them. In one document, *The Conifer Connection* provides the user with:

- ✓ Information on the human history of California's coniferous forests and watersheds
- ✓ Information on basic ecological principles (sort of a review of high school science)
- ✓ Information on the science particular to the coniferous forest ecosystem
- ✓ Information on how to set up and conduct a field trip to a forest or park
- ✓ Standards-correlated lessons and activities for before, during, and after a visit to a park or forest
- ✓ Up-to-date lists of contacts and sources of materials

The Conifer Connection is written for teachers, docents, parents, youth group leaders, naturalists, and anybody else who wants a comprehensive guide to coniferous 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 coniferous forests.

The Conifer Connection 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. *The Conifer Connection* is intended to supplement and complement them rather than to replace them.

Why *The Conifer Connection*?

There are many reasons for the creation of *The Conifer Connection*. The increasing rarity of outdoor education opportunities makes those opportunities ever more precious. When a child does get to visit a 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.

The Conifer Connection is intended to provide accurate information about conifer forest ecosystem; it is not intended to be propaganda, either against the forest products industry, or against protecting and conserving the forests. We hope that knowledge about forests and watersheds will enable students and adults alike to make wise choices with regards to use and protection of our natural resources.

Some elementary school teachers and volunteers have strong backgrounds in science and natural history, but many do not. Elementary teachers may have majored in English, social science, math, art, or any one of a number of areas other than science. One of the few exposures to nature that many elementary school students experience is participation in an “outdoor education” camp, often in fifth or sixth grade. The staffs of outdoor education schools do a good job. *The Conifer Connection* 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. *The Conifer Connection* is also useful in the training of outdoor education staffs and volunteers.

The Conifer Connection 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 *The Conifer Connection* goes beyond what teachers should expect elementary students to know and understand, but it is important for the teacher’s understanding of the coniferous forest community. The scientific information in *The Conifer Connection* provides a quick review of the ecological principles taught in most high school science classes, as well as information on the unique characteristics of California’s coniferous forests.

Even those who know the science of the coniferous forest may not know the human history of the region. *The Conifer Connection* includes a summary of some of the major ways in which humans have influenced, and been influenced by, the forests—from the Native Americans to the heyday of logging in the 1940s and 1950s, to modern resource management practices.

Except for some activities that were created by the author, all of the information in *The Conifer Connection* 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. *The Conifer Connection* 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 coniferous forest or park.

A trip to a forest or 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 forest not as just a day out of the classroom or just a day in the woods. A field trip to the forest should be enjoyable, of course, but it should also provide the students with opportunities to learn about and increase their appreciation for these trees 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 forest ecosystem is necessary if we are to not only enjoy and protect the trees and other organisms in our parks, but to wisely manage our forests and watersheds as the valuable resource that they are.

How to Use *The Conifer Connection*

The Conifer Connection is divided into four sections:

Section I (page 7) provides background natural history information, including a review of basic scientific and ecological principles, and descriptions of some of the more common or important organisms of the forest.

Section II (page 105) deals with the human history of California's coniferous forest areas, from the early Native Americans to modern times.

Section III (page 157) explains how to plan and execute a field trip to a forest or park.

Section IV (page 165) provides lessons and activities that can be done before, during, and after a trip to a forest or park. Most of the activities could be used in other forest types, or even non-forest ecosystems. While the lessons are correlated to content standards for grades 4–7, most can be easily adapted for use in other grade levels.

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 coniferous forest ecosystem can use *The Conifer Connection* to supplement their current resources. It can provide a basis for developing a guide for a specific area; since *The Conifer Connection* is written for the entire coniferous forest region, educators who want to go into depth about a specific area will need to supplement the general information found in *The Conifer Connection.* If you are planning a visit to a coast redwood park, you may want to obtain a copy of *Redwood Ed*. It is available from California State Parks (download from the State Parks Internet site at www.parks.ca.gov/teachersguides) or from the Stewards of the Coast and Redwoods (print or CD copies).

While a teacher (or parent, naturalist, docent, or youth group leader) does not have to be an expert on the ecology of the coniferous forest, a basic understanding of ecological principles will enable the teacher to help students maximize their learning during the precious time spent in the forest or park. *The Conifer Connection* 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 forest.

The Conifer Connection includes numerous illustrations. Some are presented in a large format (½ page in size) to make it easy to copy onto transparency material for projection. Many photographs are smaller and are intended to illustrate points being made or to provide examples of things to look for while on a field trip with students. Drawings of organisms are done as line drawings to facilitate duplication and so that students can use them as a "coloring book" if you wish.

A teacher or group leader who has an understanding of basic forest ecology can better act as a **guide on the side**, helping students to discover and construct knowledge, rather than simply being an encyclopedia of facts or **sage on the stage.** The activities in *The Conifer Connection* help the students both learn and learn how to learn.

To help the students prepare for their visit to the park or 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 the students, and should, of course, feel free to modify the suggested activities as he or she sees 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 activities in *The Conifer Connection* are correlated with the grades 4, 5, 6, and 7 California State Content Standards in science, history/social studies, mathematics, and English. They are also correlated with the National Content Standards in science and

social studies. In addition, the activities are correlated with California's Environmental Principles and Concepts. (See page 6 and Appendix I.)

The study of the 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 parks.

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 "Connie Fir" image (icon) beside them. Connie Fir icons will also alert you to potential safety issues in lessons and activities.

Teaching Idea

Caution

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

Appendices include a listing of the state and national standards with which the activities are correlated, in abbreviated or paraphrased form.

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.

The Web addresses listed in *The Conifer Connection* were accurate at the time of publication, but they often change. If an address doesn't work, perform an Internet search for the organization.

About State Standards

State Content Standards are an important part of the educational landscape in 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 forests and parks may need to justify the use of class time and scarce resources for the trip. The activities and lessons in *The Conifer Connection* 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 also listed. The California State Content Standards that *The Conifer Connection* addresses are listed in Appendix I.

About California's Environmental Principles and Concepts

As part of the Education and the Environment Initiative (EEI), California has recently developed a set of Environmental Principles and Concepts that 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. Eighty-five EEI Curriculum units have been developed and provide numerous examples of how to teach the Environmental Principles and Concepts, and state concept standards, through the use of model curricula for science and social studies in grades K-12. The Environmental Principles and Concepts are listed in Appendix I, page 330.

The EEI Curriculum consists of 85 units for grades K–12. Each unit focuses on one curriculum standard in science or history-social science. Each provides several lessons that enable the teacher to teach that standard from an environmental perspective.

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

California Environmental Protection Agency
Office of Education and the Environment
P.O. Box 2815
Sacramento, CA 95812-2815

(916) 341-6769

www.CaliforniaEEI.org or www.calepa.ca.gov/education/eei

www.EEI@calepa.ca.gov