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Quo Vadis Quercus—An Interim Solution

Harold R. Walt, Kenneth E. Mayer, Robert A. Ewing, and Dean A. Cromwell

The composition and structure of California's hardwood forests has been modified over time to accommodate various uses, and until recently, few people questioned the effect of this conversion. Removal of hardwoods has been an accepted way of life, where they have been viewed as unwanted vegetation in the path of agricultural crops, range improvement, and construction of freeways, dams, and houses.

On the other hand, people have placed value on recreation and wildlife habitat associated with hardwoods. They have come to appreciate the aesthetic qualities of oaks and, especially in urban areas, to pass laws to protect these trees. Thus, questions are being raised about the loss of wildlife habitat, degradation of soil and water quality, and even the ability of the resource to regenerate itself.

Private owners hold over 70 percent of the state's hardwood rangelands. Ranchers are currently struggling in a fiercely competitive market, where demand for beef has slackened and prices have remained low. This has increased pressures to cut hardwoods for firewood and to subdivide ranches. Clearing oaks has resulted in the fragmentation and conversion of what once was a contiguous resource land base. Consequently, an approach to the hardwood conversion issue has evolved. This approach takes the strength of our traditional rural experience, but mixes in new elements appropriate to today's urban California.

Hundreds of thousands of acres of hardwoods on rangelands have been harvested or converted since 1945. While the quantitative effects of such removals on wildlife, soil erosion, and water quality have not been determined, intuitively we recognize that changes have occurred. Whether, as argued by preservationist groups, these changes have created a crisis situation for the hardwood resource and are occurring at such a rate that strict governmental intervention is warranted, is still up for debate. However, we feel the solution to the problem must be equally balanced between the severity of the situation and the probability of success in accomplishing the desired result.

In June of 1985 we reported in *Rangelands* on the emerging hardwood controversy in California (Walt et al. 1985), a controversey that is a result of a set of complex social, biological, and management factors which poised landowner and land use rights issues against the call for greater resource protection.

Blue oak-digger pine woodland at Fort Hunter Ligget, Monterey County. Photos by Lynn Huntsinger

Since 1981, much debate has been heard concerning the status of the hardwood resource, its management or mismanagement, and whether state government should take an active role in protection through regulation. In response to this controversy, the California State Board of Forestry (BOF) began a thorough fact-finding mission in 1980 to determine the status of the hardwood resource. Adequate time was allowed to gather and establish short-term programs to address only the most pressing problems. This article, thus, describes the development of an interim solution to the hardwood issue and the BOF's hardwood policy.

Past Events

Based on studies conducted in 1981-83, it was clear that critical information about the hardwood resource was lack-

Authors are, respectively, chairman, California State Board of Forestry, Sacramento; wildlife and range ecologist, CDF, Forest and Rangeland Resources Assessment Program, Sacramento; program manager, CDF, Forest and Rangeland Resources Assessment Program, Sacramento; and executive officer, California State Board of Forestry, Sacramento.

University of California Cooperative Extension demonstration project review. Photo by Lynn Huntsinger

ing. The Board worked cooperatively with: the California Department of Forestry and Fire Protection (CDF), specifically the Forest and Rangeland Resources Assessment Program (FRRAP); the University of California's Cooperative Extension (UCCE); and the USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. This interagency project produced much of the hardwood information available today. In addition, a symposium was held on Multiple-Use Management of California's Hardwood Resources in November 1986 at California Polytechnic State University, San Luis Obispo, where 92 technical papers were presented.

The interagency cooperation has produced important results. First, $1 million was acquired from the California State General Fund to establish a new Hardwood Management Program within Cooperative Extension and CDF, including funds for research programs. Within Cooperative Extension, five new hardwood extension specialist positions were established. The objective of these specialists is to work with the hardwood rangeland owners to encourage proper hardwood management and to apply the results from the on-going research effort. A research program is funded for a ten-year period through the University of California, while the CDF research dollars are reviewed and approved on a yearly basis.

Second, in addition to the research results presented at the hardwood symposium, three important documents have been published. C.L. Bolsinger in a report now in press, reports on the hardwoods of California's timberlands, woodlands and savannahs, including inventory data on the extent of various hardwood types, hardwood volume, growth, mortality and harvest, stand characteristics and conversion. These data were a critical link in determining the overall status of the resource. Additionally, Mayer et al. (1986) produced a report titled *Status of the Hardwood Resource of California.* This report summarizes existing ecological, management and social data relative to hardwoods in California, and provides a description of on-going hardwood research projects throughout the state. And finally, a white paper entitled *Policy Options for California Hardwoods* (CDF 1986) was developed specifically for the BOF. The policy white paper evaluated the status of the hardwood information and arrayed the available policy options.

Proposed Solution

As reflected in the Proceedings of Centennial I (Tosta 1985) the BOF began a discussion of possible solutions by recognizing an overall vision for the resource. This vision included the following:

1. The hardwood resource, whether on conifer or hardwood rangelands, should be protected and enhanced. This means that all hardwood species are regenerating, soil and water quality are preserved, and sufficient habitat diversity is achieved statewide to protect the viability of important wildlife species;
2. Range and timber stand improvement can continue—but such activities should take into account sensitive environmental areas and potential effects on wildlife populations. Additional sources of income to landowners need to be available through improved utilization, new markets for products from species that are regenerating well, and programs to compensate landowners for leaving hardwoods;

3. Land can continue to be converted to intensive agriculture and residential/commercial development—but it should be directed away from environmentally sensitive areas, avoid serious damage to wildlife, and not interfere with the ability of landowners to manage their land economically;
4. Governmental involvement in land management decisions of private landowners should be minimized and, in so far as possible, supportive of their needs. Public agencies, federal through local, should understand and be coordinated with each other and with private landowners in their management goals and practices.

The problems of maintaining hardwood resources in California are not well suited to a singular government control. It is not reasonable for the state to purchase properties for public ownership, and an autocratic enactment of restrictive land use controls will not save the day. Rather, government must employ a set of programs which allows the state to ensure long-term environmental health while allowing the landowner full use of his or her property. Policies adopted need to employ a variety of means, including research, monitoring and assessment programs, strategies to relieve pressures for hardwood removal, improved management information, and if this approach fails, regulation.

To this end, the BOF elected to take an aggressive non-regulatory approach to the problem. While the Board does have the authority under the Forest Practice Act to regulate the removal of hardwoods on rangeland, it was determined that a non-regulatory approach to solving the issue at hand was in the best interest of the state. Initially, the people and the hardwood resource of California would be best served by attempting education before regulation.

In a motion passed by the BOF on February 3, 1987, a hardwood policy was established.

> While the Board believes that it has the authority and obligation under the Forest Practice Act to protect the hardwood resource, we conclude that it is premature to declare hardwoods as commercial species at this time. Some benefits may come from statewide regulation; however, the costs appear greater, both in dollars and in reduced responsiveness of local governments and landowners to nonregulatory programs.
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> The Board believes that the most promising and effective action to address problems related to regeneration, conversion, and wildlife habitat is an intensive educational program involving landowners, state agencies and local governments, UC. Extension, and interest groups. Improved communication between these entities can improve understanding and lead to faster issue resolution. And ultimately, if these approaches fail, the Board can still initiate regulations.
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> Consequently, the Board requests that the Department of Forestry and Fire Protection (CDF) take the lead in implementing the array of non-regulatory programs to address the hardwood issue that are mentioned in the staff *Options Paper*. The Board specifically requests that CDF take a direct lead in research related to hardwoods issues, especially questions related to regeneration and the condition of the range industry. CDF is also requested to address programs related to the conversion of hardwoods to conifers.
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> The Board instructs the Range Management Advisory Committee to address programs related to the maintenance of a healthy range industry and to conversion of the range resource to commercial/residential uses. They should work closely with their technical advisers, CDF, and all concerned parties.
>
> The Board also requests that CDF work closely with the Department of Fish and Game to address questions related to hardwoods and wildlife habitat. This should include dissemination of maps of critical deer habitat, development of guidelines on wildlife habitat for landowners, and drafting of a Board policy on protection of wildlife habitat in hardwoods.
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> To better evaluate the effect of these programs, the Board asks that CDF, drawing as needed on other agencies, report quarterly, beginning with the June, 1987, meeting."

Current Status

How well will the non-regulatory approach facilitate reaching California's vision for hardwoods? At this point it is too early to tell; however, the progress to date is encouraging and suggests success for the future.

At the June, 1987, BOF meeting, representatives of the Board's Range Management Advisory Committee (RMAC), University of California Cooperative Extension (UCCE), CDF, and the California Department of Fish and Game (DFG) reported on the progress of various aspects of the hardwood program. Activities, have been related mostly to planning and improved communication and coordination of state agencies. The accomplishments are as follows:

1. RMAC has formed subcommittes to discuss problems related to wildlife, conversion and range modification. Additionally, they recommended a follow-up symposium on hardwoods to clarify differences in attitudes, responsibilities, and options for agencies and interest groups in the hardwood program;
2. UCCE has developed an aggressive program of applied research, demonstration projects and education intended to improve management of California's hardwood rangeland
3. CDF reported on 18 new research projects and outlined a monitoring program for hardwood removal. The monitoring program will focus on hardwood habitat changes in critical deer winter ranges and selected areas of significant biological importance. In addition, a voluntary harvesting reporting process has been developed and will receive extensive participation, and
4. DFG has distributed "first generation" deer herd maps, depicting deer ranges for migratory deer. Moreover, they will assist UCCE with education and CDF with the hardwood monitoring program.

The Hardwood Program is reaching a critical stage. Landowners and local governments will soon have more information on critical aspects of the hardwood resources. Thus, with better information and an on-going monitoring system, better focused policy and management decision will be possible.

Through the development and extension of hardwood management, information and techniques which service both the landowner and the resource, it is hoped that protection and perpetuation of the hardwood resource will occur. As policy makers, we have first attempted to solve the problem by placing trust and responsibilities with the people who control and manage the resource. We hope that this trust will be met with positive action. Without positive action, resulting in improvements in the current situation, the Board will once again be forced to deal with the issue. Options available at

that point would be narrowed, and state regulation might be the only solution.

Fortunately, we feel that the interim solution has been received with tacit acceptance by policy makers, environmental groups and most importantly, the landowner. We are encouraged that the integrated and interdisciplinary approach to resolving this major social issue will prevail.

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Plant Succession on Surface Mined Lands in the West

Philip R. Ogle and Edward F. Redente

Editor's Note: A paper on this subject, " 'Native' vs. 'Exotic'—The Dilemma of Ecological Mine Waste Revegetation" by Stuart A. Bengson, appeared in *Rangelands* 8(2):65-67, 1986.

Succession is a natural process of plant community development. On abandoned spoil, succession to a stable community may take from tens to hundreds of years. Reclamation is important in shortening the time period of succession. However, even under the best reclamation technology it is not possible to immediately establish communities that are as diverse or as stable as native communities. Consequently, succession will be important in further development of communities following initial plant establishment. Succession may initially increase species diversity, allow establishment of microbial populations, and promote soil development.

Plant succession will also be important in meeting requirements of the Surface Mining Control and Reclamation Act of 1977. This law requires that plant communities be established that are permanent, effective, diverse, and of the same seasonal variety as those native to the area or that will support the approved post-mining land use. When the proposed post-mining land use is grazing land, the goal of reclamation is essentially to establish diverse and stable plant communities which will sustain livestock grazing and wildlife use. To accomplish this goal within a short time frame, techniques which will accelerate succession must be used.

Natural Succession on Abandoned Mine Spoil

Geologic material removed from above a mineral deposit during surface mining is commonly referred to as spoil. Spoil varies considerably in physical and chemical properties because of the different geological formations from which it originates, and may contain high concentrations of soluble salts or acid-forming materials.

The process of succession on spoil can be better understood through an analysis of the factors that affect it. There have been many descriptions of these factors and one of the most simple and yet one of the most complete is the model used by Major (1951) to describe the interrelationship of plants to their environment. The model includes the effects of regional climate, parent material, relief, organisms and time. This model is compatible with most climax-oriented successional theories including Daubenmire's (1968) and Odum's (1971). In this model, organisms include soil biota, vascular plants, animals, and man.

Climate and time can be considered independent factors since they can not be greatly influenced during the reclamation process. Therefore, the remaining three factors (organisms, parent material, and relief) become especially important in the design of reclamation practices to induce succession on mined lands. These are also factors which have been emphasized in recent studies of succession on orphaned spoil in the West.

Organisms

Soil Biota

Cundell (1977) in his review of the role of microorganisms in revegetation of strip-mined lands stated that the first microorganisms to inhabit abandoned spoil are those with the capacity to fix atmospheric nitrogen. Free nitrogen in the spoil in turn stimulates invasion and establishment of other microorganisms and the first plants. Researchers report that as spoil age increases, microbial activity becomes similar to that in native soils. Stroo and Jencks (1982) working in West Virginia, reported that after 20 years, microbial activity in the surface 10 cm of spoil was less than in native soils. They also

Authors are range scientist, Abandoned Mine Lands Program, Department of Environmental Quality, Cheyenne, Wyoming; and associate professor, Colorado State University, Fort Collins.

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