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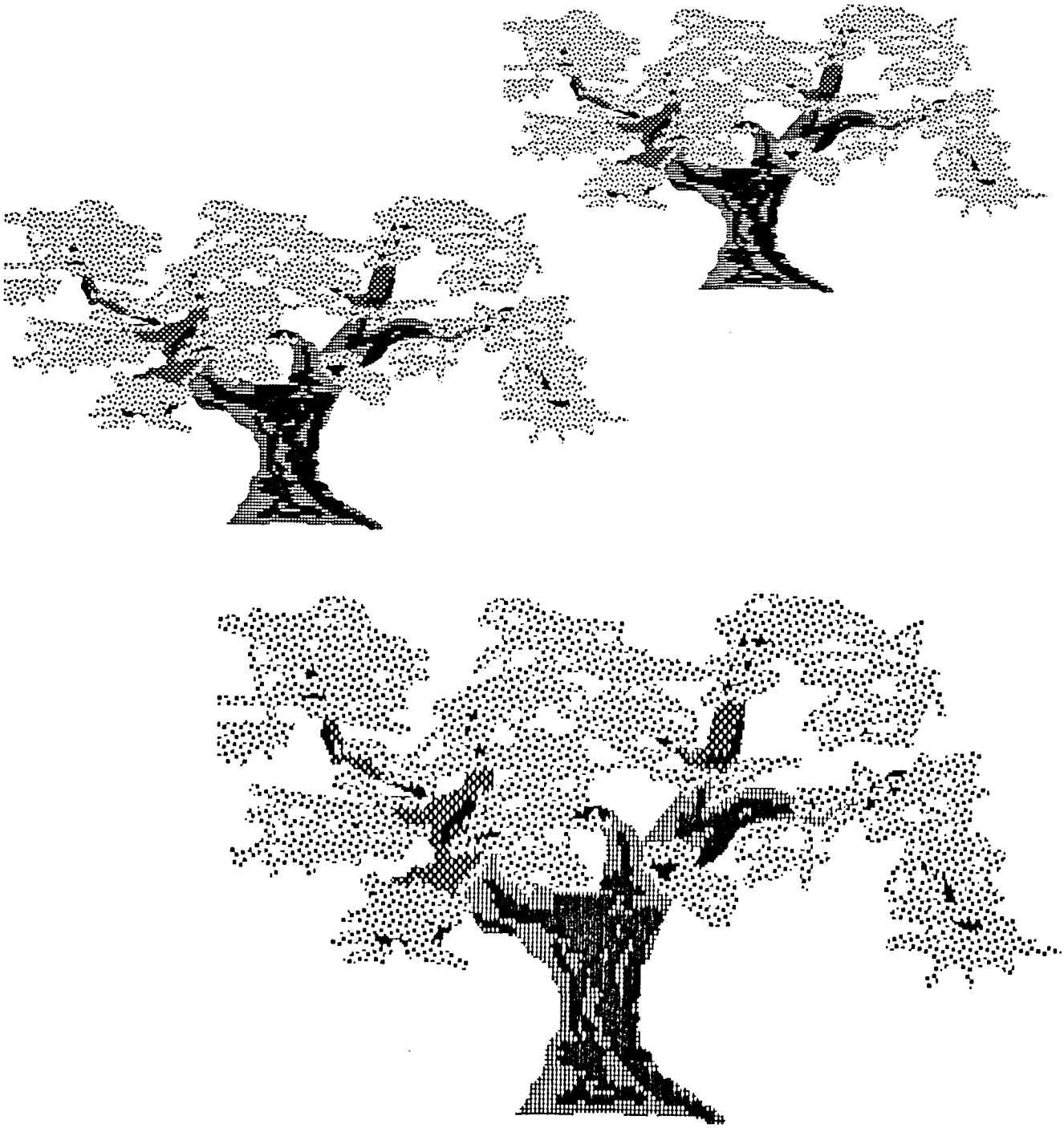

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Central California Oak Residue Utilization and Marketing: Better Hardwood Management from Improved Utilization[1]

Timothy O'Keefe and Douglas Piirto[2]

Abstract: Limited information and observations indicate that there are some significant amounts of hardwood residue resources now available in the Central Coast area. Experience gained from managing and marketing eastern hardwoods is considered as our basis for dealing with western hardwood problems.

Inventory of the oak resource is discussed as a preliminary requirement for management. In addition, hardwood marketing, research and extension needs are also considered.

Evidence indicates that western hardwood use will be improved by better funded programs of research and extension in residue utilization and marketing. Improved hardwood utilization will yield both direct and indirect benefits. Direct benefits include additional, better quality wood at lower consumer cost and increased tax receipts. Other, indirect benefits include improved hardwood forest management, better fire management, and improved multiple resource management for watershed, range and recreation values.

Throughout the natural range of California oaks (Quercus spp. and Lithocarpus spp.), there is growing concern about the question of over-cutting and under-utilization. During the past few years, greater attention has been given to the problem of oak regeneration growth. However, oak utilization and particularly residue use is far less clear.

The Board of Forestry on the occasion of its Centennial anniversary sought to find new ways to approach forestry in California. It was reported at the Centennial II Conference (California Board of Forestry, 1985) that:

> Within California, both the timber and range-livestock industries are suffering. Both have prolonged periods of low product prices and major readjustment among producers. A number of ranchers have lost their property to foreclosure. Several of the major timber producers have been absorbed as part of leveraged buy-outs from investors without any historical interest in timber growing in California. In addition, a number of smaller landowners and loggers have either gone out of business or have had to limit their operations. Events such as these raise serious questions about the ability to attract and maintain private investment capital in the traditional resource industries such as timber and ranching. This is compounded by the negative perception that investment in forestry in California will be burdened with increasingly expensive regulations.

One of the major issues facing the citizens and land managers of California (identified at the California Centennial II Conference-California State Board of Forestry, 1985) is: "How can California forest and rangeland owners and industries better market existing and new products?" Several strategies have been identified including: 1.) research and develop new products (e.g., furniture, panels, pre-fab products) to meet identified demand; 2.) improve utilization of California timber species; 3.) develop active marketing associations for export of forest and range products; 4.) set up production teams to brainstorm, Identify innovative programs, and analyze current and potential markets; 5.) improve marketing techniques to increase demand through advertising and other techniques. Other strategies have been identified, but the above directly apply to the issue of extending utilizaiton [sic] the California hardwood resource. It is our contention that better land management will occur on California's hardwood lands through better utilization. Ranchers, for example, would approach hardwood land as areas to be managed rather than converted to grasslands given a better economic picture through integrated multiple use management (e.g., wildlife, range, hardwood utilization).

The purpose of this paper is to explore non-traditional approaches to multiple use management of the hardwood lands in Central California. Traditionally, the full value of California's oak and hardwood resources has not been widely recognized. Until the late 1950's, oak was a major material that supported the sizable Central Coast charcoal business. More recently, since the Arab Oil Embargo in the early 1970's, the California oak resource has again been recognized as an important fuelwood resource. However, aside from this wood energy use, only a very limited use has been made of the California oak resource. A few sawmills now manufacture a limited amount of oak lumber, and oaks have

[1]Presented at the Symposium on Multiple-Use Management of California's Hardwood Resources.

[2]Professor of Forest Resources, California Polytechnic State University, San LUIS Obispo; and IPA Associate Professor of Forest Resources, California Polytechnic State University, San Luis Obispo.

been used for other products like pallets, posts, and ties on a restricted basis. This paper will discuss some alternatives for better management, utilization and marketing of California's oak resource.

EASTERN HARDWOODS

In sharp contrast to this picture of under-utilization of California oaks, the hardwood resource in the northeastern United States has undergone, in recent years, a kind of "economic renaissance." For many years, the rate of hardwood utilization in the northeast declined steadily. This decline was due primarily to a decrease in wood quality- which included an increase in small sized, poorly formed and defective stems. As a result of the increasing quantity of this low quality hardwood material- many speciality [sic] mills in the northeast were forced out of business and competition for the lucrative export market became extremely difficult. This increasing problem of low quality hardwood growing stock was exasperated by the increased ac-cumulation of hardwood residues.

In the late 1970's, local demand for eastern hardwoods as a wood energy raw material source and for wood pellets increased significantly. However, the most significant improvement in northeastern hardwood utilization resulted from the development of new, engineered panel products These new particleboard products. called wafer board, and oriented strand board (OSB) are products that can be made from relatively low quality hardwood raw materials. As a result, these new wafer board mills and the 0SB plant which opened in 1981 at Clardon, New Hampshire, had a very significant impact on utilization of low quality northeastern hardwoods.

The northeastern hardwood business has faced many of the same problems now facing the California hardwood industry. Of course, the northeastern industry is a much older business which is well established with a unique marketing system. Through a complex matrix of hardwood trade associations (see Appendix) the eastern hardwood marketing system includes a relatively strong technology transfer process. It is interesting to note that most of these associations are located in the eastern and midwest areas of the United States. Presently, there is only one major west coast hardwood association.

The technology transfer segment is a joint system where the wood industry, together with state and federal agencies, such as the State Utilization and Marketing Forester as well as the Cooperative Extension Service, have developed a system to connect the university and state research laboratories with the technology user at the plant level. Of course, this system is a "two way" pipeline which not only moves information from the lab to the user, but also provides a mechanism by which field problems are transmitted to the laboratory for appropriate solutions. Timely applications is one of the most significant aspects of this technology transfer process. In a relatively short time, the over-supply problem of low quality eastern hardwoods was identified. and practical solutions were developed and implemented. on a timely basis.

New technology and technology transfer alone will not solve the California hardwood problems. However some of the techniques used to deal with the northeastern hardwood problem may, in fact, have application to the western oak utilization problem.

WESTERN HARDWOODS

A number of problems relating to the utilization of California's hardwood resource have been identified. Some of the major western hardwood management problems focus on: 1.) inventory techniques; 2.) lumber drying and machining techniques; 3.) volume and biomass (both total and available); 4.) multiple use management (e.g., range, wildlife, recreation, watershed) interaction with wood value; 5.) residue utilization; and 6.) hardwood marketing. Other researchers and managers have earlier addressed some of these problem areas, in at least a preliminary investigation. For example, the California Forest Products Laboratory has carried out a number of drying, machining, and a variety of other wood property evaluation tests of several California hardwoods. In addition, the California Cooperative Extension Service during this past year has published a management guide for multiple use management of oak woodland for wildlife, range and wood resources.

However, the question of residue utilization and marketing are two western hardwood problem areas that have not been widely addressed. For this reason, it is now timely to consider these two problem areas more closely. In terms of hardwood residue utilization, there are still many unanswered questions, such as:

1. What is the volume of residues on hardwood lands?
2. What types of products could be manufactured from these residues?
3. What can be done to better organize the very fragmented fuelwood market?
4. What Is the significance of oak residue in terms of: soil nutrients; fire hazards; aesthetics; restricted access; regeneration shade and shelter; Insect and disease; air pollution-disposal; additional fiber source?

These and many more questions remain to be answered. The remainder of this paper will focus on a research approach to identify ways to extend the utilization of hardwood (oak) residues.

OAK RESIDUE RESOURCES

At present, there are some reliable oak volume tables available that will permit satisfactory

estimates of oak growing stock. However, there is very little information available now that will help a landowner determine volume and value of oak residue. For purposes of this paper, oak residue has been defined as including the total biomass material of the tree and stand that has not been conventionally utilized (e.g., bole for lumber, fuelwood products).

On any walk through an oak stand, it is clear that total wood volume must include not only the live growing stock, but also the dead and down residue materials. For this reason, a "standard" cruise over an oak forest area will yield only a partial estimate of the total biomass volume. Total volume is a composite of both live, upright, and dead, down, materials. In many stands, depending on age and general condition, there is a very significant volume of raw materials in the residue category.

Biomass cruising techniques to estimate northeastern hardwood residue volumes have been developed and refined over the past twenty years. These biomass cruising techniques, which have been very effective, represent the first step in more efficient hardwood utilization.

An effective system of oak biomass/residue inventory could be based on the following procedures:

1. Field sample residues on a known area.

    a. These initial procedures would involve measurement and weight of oak residue in a clearly defined stand.
    b. Stands sampled could be correlated with stand density and volume.

2. On low altitude air photos of the study area, establish relationships between live crown diameter and residue volume.

3. On other appropriate study areas, field test these biomass/residue cruise techniques.

4. Develop and implement an appropriate technology transfer effort.

The initial phase of a residue inventory will be a field sample to determine both volume and condition of the residue material. On a series of one-half acre sample plots identified from low altitude air photos, a full sample of oak residue will be measured and correlated with individual tree size and crown diameter. These residue volume measurements will be based on direct volume measurement of larger pieces and direct biomass weight of smaller materials. In addition, the condition of all residues, in terms of soundness, will also be noted and a moisture content sample taken from different size materials for lab analysis.

The second phase of an oak residue resource inventory would be construction of residue tables to crown diameter. "These residue tables will then be field tested, using low altitude air photos and "ground truth" test plots. Results of these field tests will provide a measure of the accuracy with which it is possible to predict the volume of oak residues based on air photo, biomass cruising techniques.

If these oak residue, biomass inventory techniques are indeed effective, the final step of the project will be to develop an effective technology transfer system. Information and details about collecting oak residue field information will be provided to interested individuals and groups throughout the state in a timely systematic process. This technology transfer effort will be the first step towards better utilization of this important oak residue resource. Beyond this point of oak residue resource inventory and technology transfer process lies the very important element of a marketing strategy.

RESEARCH NEEDS

Improved residue utilization is only a small part of a much larger utilization [sic] problem of California hardwoods. A fractured market, at best, exists for the sale of hardwood products (e.g., fuelwood, lumber, and specialty products). This market picture would be improved with: 1.) execution of research on more effective ways of utilizing and marketing the California hardwood resource; 2.) formation of trade associations or cooperatives focused on management and utilization of California hardwoods (similar to the effort put forward by the California Redwood Association to find available markets for coast redwood); and 3.) development of landowner assistance programs.

Leadership is the key to improving the underutilization and land management problems of California's hardwood lands. Technical trade associations and/or land owner cooperatives along with the California Board of Forestry could play a key role in responding to the Centennial question "How can California forest and rangeland owners and industries better market existing and new products?"

SUMMARY AND CONCLUSIONS

At present, there is in California a large and valuable hardwood resource that suffers from limited management and utilization. In recent years, similar problems in connection with eastern hardwoods have been identified, and solutions developed. One method that can improve western oak utilization is to extend the use of residues. However, more efficient residue utilization must be preceded by a stronger hardwood research and market development program.

A more efficient hardwood marketing process can be constructed on the following strategies: 1.) extend hardwood association activity; 2.) develop active hardwood landowner and marketing cooperatives; and 3.) more aggressive national and international sale promotion program.

A complete residue utilization program must include a strong research component. Some of the major residue use questions include: 1.) residue volume, total and available; 2.) inventory techniques and costs; 3.) new residue and solid wood products; 4.) residue harvest, techniques and cost; 5.) effect of residue use on other multiple use, oak resource values. In order to investigate these residue use and marketing questions, it is essential that an adequate and continuing funding source be provided. At present, there is a great need for more fundamental data on hardwood resources.

Improved hardwood utilization will require an expanded technology transfer effort. It is encouraging to note that just recently, the California Cooperative Extension Service, in cooperation with the California Department of Forestry, has funded several extension specialists to provide information about the hardwood resource. This is a good start, bur additional technology transfer is still needed for a complete, efficient hardwood information program.

Improved hardwood utilization will require expanded program efforts and funding support in terms of: 1.) residue utilization, 2.) hardwood marketing and 3.) hardwood information transfer. Better hardwood utilization is the basis for improved forest resource management, on a sustained yield, multiple use basis. Improved utilization and management will provide forest landowners with additional alternatives to the current practice of woodland conversion. In addition, improved management and utilization also offers other public benefits in terms of: 1.) more wood at a lower cost; 2.) improved tax receipts; 3.) improved visual quality and 4.) improved recreational opportunities. Hardwood utilization and management is today in California a pressing issue that requires a responsible and timely resolution effort by both the private and public sectors. Improved multiple use land management of California's hardwood lands can occur with better utilization and product marketing.

REFERENCES

California Board of Forestry. 1985. Issues and Strategies for the Development of the Centennial Action Plan. Proceeding of the Centennial II Conference, December 4 - 5, 1985. Sacramento, California.

Plumb, T.R.; McDonald, P.M. 1981. Oak Management in California. USDA Forest Service Gen. Tech. Report PSW-44.

Pillsbury, N.H.; Kirkley, M.L. 1982. Hardwood Biomass Inventories in California. In: Proceedings of the Symposium on Dynamics and Management of Mediterranean-type Ecosystems, June 22 - 26, 1981. San Diego, California. Gen. Tech. Report PSW-58, Berkeley, CA. PSW, USDA-FS, pp. 171-118.

Pillsbury, N.H.; Brockhaus, J.A. 1979. Tree Photo Volume and Weight. Tables for California's Central Coast. Central Coast Consortium and Development Area. Salinas, CA. 45 pp.

O'Keefe, T.G. 1982. Hardwood Utilization: A Down East View Fuel or Fiber? Hardwood Utilization and Marketing Opportunities Maritimes Forest Research Center, New Brunswick, Canada. pp 11-13

APPENDIX

Partial List of Important Domestic Hardwood Associations

1. National Wood Pallet and Container Association
2. Associated Cooperage Industries of America, Inc.
3. Hardwood Dimension Manufacturers Association
4. Southern Hardwood Square Association
5. Maple Flooring Manufacturing Association
6. National Oak Flooring Manufacturers Association
7. Hardwood Research Council
8. Maine Hardwood Association
9. National Association of Furniture Manufacturers
10. Furniture Manufacturers Association of Calif.
11. Hickory Handle Association
12. Appalachian Hardwood Manufacturers, Inc.
13. The Hardwood Institute
14. National Hardwood Lumber Association
15. Indiana Hardwood Lumberman's Association
16. Northern Hardwood and Pine Manufacturers Assoc.
17. Southern Hardwood Lumber Manufacturers Assoc.
18. Southern Hardwood Manufacturers Club
19. Wood Turners and Shapers Association
20. Fine Hardwoods-American Walnut Association
21. Hardwood Plywood Manufacturers Association
22. Hardwood Veneer Association, Inc.